



Complete Preparation Book

Concept Clarity | Smart Practice | Rank Booster Questions



BANDI DAYASAGAR

Diploma Mechanical Engineering
B.Tech Mechanical Engineering
M.Tech Thermal Engineering
MS (Computer Information Systems), USA

An Initiative of Sagar Educational Society

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First Edition: 2026

Published in India

Author: **Bandi Dayasagar**

An Initiative of: **Sagar Educational Society**

ISBN: 978-93-5810-741-8

Publisher:

Bandi Dayasagar

Imprint: An Initiative of Sagar Educational Society

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Printed and bound in India

Dedication

This book is dedicated to all Diploma students who dream of becoming engineers and building a better future for themselves and their families.

To the students who study silently, who struggle quietly, and who continue moving forward even when the path feels difficult.

I was once in your place.
I understand your journey.

This book is for you.

May your hard work turn into success,
and your effort turn into confidence.

Bandi Dayasagar

Preface

AP ECET is not just an entrance exam.

For Diploma students, it is a gateway to B.Tech and a better future.

Success in ECET does not depend on studying more books. It depends on understanding the exam pattern, focusing on important topics, and preparing in a smart way.

During my academic journey — from Diploma to B.Tech, M.Tech, and MS — I understood one important truth:

Students do not fail because they are weak.

They lose marks because they prepare without direction.

This book is written in very simple and clear language so that every student can understand concepts easily and prepare with confidence. Instead of lengthy theory, this book focuses on:

- Important concepts based on weightage
- Frequently repeated questions
- Clear formulas and comparison tables
- Practice questions from basic to rank level
- Smart revision strategy

Every unit is prepared after carefully analyzing previous ECET question papers and scoring patterns.

This book is designed not just to help you pass ECET, but to help you score maximum marks and build strong confidence for your B.Tech journey.

If you follow the structure given in this book with discipline and consistency, you can achieve excellent results.

Wishing you focus, confidence, and great success.

Bandi Dayasagar

Founder – Sagar Educational Society

Diploma – Mechanical Engineering

B.Tech – Mechanical Engineering

M.Tech – Thermal Engineering

MS – Computer Information Systems (USA)

ABOUT THE AUTHOR

BANDI DAYASAGAR

BANDI DAYASAGAR is an academician, researcher, and career mentor with a strong foundation in Mechanical Engineering and advanced expertise in Computer Information Systems. He began his academic journey with a Diploma in Mechanical Engineering, followed by B.Tech in Mechanical Engineering and M.Tech in Thermal Engineering under æ under JNTUK University. He later completed MS (Computer Information Systems), USA from New England College with an outstanding CGPA of 3.96/4.00.

His academic and research interests focus on thermal engineering, power plant systems, fluid mechanics, computational simulations, and data-driven engineering analysis.

In 2020, he received the Research Excellence Award from the Institute of Scholars (InSc) for his published research work titled “Improving Thermal Power Plant Efficiency” published in International Journal of Recent Technology and Engineering, Volume 8, Issue 6, March 2020, Pages 1265–1274, ISSN: 2277-3878. His research focused on improving thermal power plant efficiency using analytical methods, simulations, and performance optimization techniques.

He has also completed multiple NPTEL e-verifiable certifications from premier IIT institutions, including Power Plant Engineering from IIT Roorkee; Introduction to Fluid Mechanics, Laws of Thermodynamics, and Conduction and Convection Heat Transfer from IIT Kharagpur; and Computational Fluid Dynamics for Incompressible Flows along with IC Engines and Gas Turbines from IIT Guwahati.

Throughout his academic journey, he gained practical exposure through internships and research roles at prestigious national organizations including National Remote Sensing Centre (ISRO), Bharat Heavy Electricals Limited (BHEL), Rashtriya Ispat Nigam Limited (RINL), Indira Gandhi Centre for Atomic Research (IGCAR), and Dr. Narla Tata Rao Thermal Power Station (APGENCO). These experiences helped him combine theoretical knowledge with real industrial applications, simulations, and performance analysis.

With years of academic guidance experience, he founded Sagar Educational Society to mentor Diploma and Engineering students. His mission is to provide structured, exam-focused, and confidence-building preparation systems that help students achieve top ranks and build strong technical careers.

His teaching philosophy is simple:

Clear concepts. Smart preparation. Disciplined execution.

He strongly believes that with the right strategy and guidance, every hardworking student can achieve academic excellence and career success.

ACKNOWLEDGEMENT

This book is the result of many years of learning, teaching, and guiding students.

First, I thank my parents for their constant support, values, and belief in education. Their encouragement shaped my journey from Diploma to higher studies.

I sincerely thank my teachers and professors who guided me during my academic journey. Their knowledge, discipline, and clarity helped me build a strong foundation in engineering and technical education.

I am grateful to the institutions and organizations where I gained academic and practical experience. Each stage of my journey from Diploma to MS (CIS) helped me understand both theory and real-world applications.

I also thank the students I have mentored over the years. Your questions, struggles, and determination inspired me to create this book. This book is built from your needs and your challenges.

Special thanks to everyone who supported the preparation of this book directly or indirectly — through encouragement, feedback, and motivation.

Finally, I thank every student who chooses this book as a part of their preparation. Your trust means a lot.

This book is written with one clear purpose:
to help students prepare in a smart way, build confidence, and achieve success in AP ECET.

With gratitude,

BANDI DAYASAGAR Diploma, B.Tech, M.Tech, MS (CIS), USA

HOW TO USE THIS BOOK

Preparing for **AP ECET** requires **smart preparation, consistent practice, and clear understanding of concepts.**

This book is carefully designed to guide you through all these stages so that you can prepare effectively and confidently.

This section will help you understand **how to use this book in the most efficient way.**

1. Start with Unit-Wise Concept Revision

Each unit in this book is based strictly on the **AP ECET 2026 ECE syllabus.**

Before solving questions, briefly revise the key concepts of the unit such as:

- Electronic Devices and Circuits
- Circuit Theory
- Electronic Measuring Instruments
- Industrial and Power Electronics
- Communication Systems
- Advanced Communication Systems
- Digital Electronics
- Microcontrollers
- Data Communications and Computer Networks

Understanding the **basic concepts first will help you solve MCQs quickly and accurately.**

2. Practice Unit-Wise MCQs

After revising the concepts, start solving the **unit-wise objective questions.**

These questions are carefully designed to include:

- Concept-based questions
- Application-based questions
- Numerical problems similar to ECET pattern

Solve the questions **without immediately checking the answers.**

After completing a set of questions, verify your answers and understand the explanations provided.

This method will help you **identify weak areas and improve accuracy.**

3. Learn from the Explanations

Each question includes a **clear and exam-oriented explanation**.

Do not simply check the correct option.

Always read the explanation because it helps you:

- Understand the concept behind the question
- Avoid repeating mistakes
- Strengthen your fundamentals

Many ECET questions are **conceptual variations of previously asked questions**, so explanations are very important.

4. Use Mock Tests for Exam Simulation

The book also includes **Grand Tests designed according to the real AP ECET exam pattern**.

Use these tests to:

- Improve speed
- Test your accuracy
- Experience exam pressure
- Identify weak topics

While attempting mock tests, **set a timer and treat it like the real exam**.

After completing the test, carefully analyze your mistakes.

5. Revise the Most Repeated Questions

The **Most Repeated PYQ Section** contains frequently asked questions from previous ECET exams.

This section helps you:

- Understand ECET question trends
- Focus on high-probability topics
- Strengthen important formulas and concepts

Before the exam, make sure you revise this section **multiple times**.

6. Final Preparation Strategy

As the exam approaches:

- Revise formulas regularly
- Solve previous questions again
- Focus on accuracy rather than speed
- Analyze mistakes from mock tests

Remember, **consistent revision and practice are the keys to success in AP ECET.**

Final Advice

Success in AP ECET does not come from studying more books.

It comes from **understanding concepts, practicing questions, and revising regularly.**

Use this book as your **daily practice guide**, and it will help you move closer to your goal of securing a **good ECET rank and entering B.Tech.**

Table of Contents

1. COPYRIGHT PAGE	2
2. Dedication	3
3. Preface	4
4. About The Author	5
5. Acknowledgement	6
6. How To Use This Book	7
7. AP ECET ECE Weightage Table	9
8. UNIT I: Electronic Devices and Circuits	10
9. UNIT II: Circuit Theory	132
10. UNIT III: Electronic Measuring Instruments	210
11. UNIT IV: Industrial and Power Electronics	265
12. UNIT V: Communication Systems	320
13. UNIT VI: Advanced Communication Systems	360
14. UNIT VII: Digital Electronics	400
15. UNIT VIII: Microcontrollers	430
16. UNIT IX: Data Communications and Computer Networks	460
17. Most Repeated ECET Questions	500
18. Formula Revision Section	520
19. ECE Quick Revision Charts	540
20. Grand Test – 1	560
21. Grand Test – 2	585
22. Grand Test – 3	610
23. Grand Test – 4	635
24. Grand Test – 5	660

Number of Questions to be Set Unit Wise
ELECTRONICS AND COMMUNICATION ENGINEERING

UNIT NO	TOPICS	Questions
I	ELECTRONIC DEVICES AND CIRCUITS	15
II	CIRCUIT THEORY	14
III	ELECTRONIC MEASURING INSTRUMENTS	11
IV	INDUSTRIAL AND POWER ELECTRONICS	10
V	COMMUNICATION SYSTEMS	15
VI	ADVANCED COMMUNICATION SYSTEMS	10
VII	DIGITAL ELECTRONICS	10
VIII	MICROCONTROLLERS	8
IX	DATA COMMUNICATIONS AND COMPUTER NETWORKS	07
	Total	100

UNIT 1. ELECTRONIC DEVICES AND CIRCUITS

1. The current in a PN junction diode under forward bias is mainly due to

- 1). Minority carriers
- 2). Majority carriers
- 3). Thermionic emission
- 4). Recombination current

✓ Correct Answer: 2). Majority carriers

Explanation:

Under forward bias the barrier potential reduces and majority carriers cross the junction easily, resulting in large conduction current.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

2. The typical cut-in voltage of a silicon diode at room temperature is

- 1). 0.2 V
- 2). 0.3 V
- 3). 0.7 V
- 4). 1.1 V

✓ Correct Answer: 3). 0.7 V

Explanation:

Silicon PN junction begins significant conduction when forward voltage reaches approximately **0.7 V**.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

3. A varactor diode is operated in

- 1). Forward bias
- 2). Reverse bias
- 3). Zero bias
- 4). Breakdown region

✓ Correct Answer: 2). Reverse bias

Explanation:

Varactor diode behaves as a **voltage-controlled capacitor** when operated in reverse bias.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

4. The main application of a varactor diode is

- 1). Voltage amplification
- 2). Frequency tuning
- 3). Rectification
- 4). Voltage regulation

✓ Correct Answer: 2). Frequency tuning

Explanation:

Varactor diode capacitance varies with applied voltage, hence widely used in **RF tuning circuits and VCOs**.

Ref: Electronic Devices and Circuits – David A. Bell

5. Zener diode is mainly used as

- 1). Amplifier
- 2). Oscillator
- 3). Voltage regulator
- 4). Filter

✓ Correct Answer: 3). Voltage regulator

Explanation:

In reverse breakdown region Zener diode maintains **constant voltage across load**.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

6. Zener breakdown occurs mainly due to

- 1). Thermal runaway
- 2). Strong electric field
- 3). High temperature
- 4). Carrier recombination

✓ Correct Answer: 2). Strong electric field

Explanation:

In heavily doped junctions strong electric field causes **quantum tunneling of electrons**, known as Zener breakdown.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

7. A circuit that removes a portion of the waveform without distorting the remaining part is called

- 1). Clamper
- 2). Rectifier
- 3). Clipper
- 4). Oscillator

✓ Correct Answer: 3). Clipper

Explanation:

Clipper circuits limit or cut off parts of the input waveform above or below certain reference level.

Ref: Electronic Principles – Albert Malvino and David J. Bates

8. A clamper circuit shifts the

- 1). Frequency of waveform
- 2). Phase of waveform
- 3). DC level of waveform
- 4). Amplitude of waveform

✓ Correct Answer: 3). DC level of waveform

Explanation:

Clamper adds a **DC component** to AC waveform shifting it upward or downward.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

9. In a BJT transistor the emitter is

- 1). Lightly doped
- 2). Moderately doped
- 3). Heavily doped
- 4). Intrinsic

✓ Correct Answer: 3). Heavily doped

Explanation:

Emitter is heavily doped to inject large number of carriers into the base region.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

10. The region of transistor that is very thin and lightly doped is

- 1). Emitter
- 2). Base

- 3). Collector
- 4). Substrate

✓ Correct Answer: 2). Base

Explanation:

Thin base ensures most carriers injected by emitter reach collector without recombination.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

11. The current gain of a transistor in CE configuration is represented by

- 1). α
- 2). β
- 3). γ
- 4). δ

✓ Correct Answer: 2). β

Explanation:

β is the ratio of collector current to base current in CE configuration.

Ref: Electronic Devices and Circuits – David A. Bell

12. The transistor configuration that provides highest input impedance is

- 1). Common Base
- 2). Common Emitter
- 3). Common Collector
- 4). Common Gate

✓ Correct Answer: 3). Common Collector

Explanation:

Common collector configuration acts as emitter follower and has very high input impedance.

Ref: Electronic Principles – Albert Malvino and David J. Bates

13. The configuration with lowest input impedance is

- 1). Common Base
- 2). Common Emitter
- 3). Common Collector
- 4). None

✓ Correct Answer: 1). Common Base

Explanation:

CB configuration has low input resistance because input is applied at emitter junction.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

14. In a JFET the drain current is controlled by

- 1). Gate current
- 2). Gate voltage
- 3). Source voltage
- 4). Drain voltage

☒ Correct Answer: 2). Gate voltage

Explanation:

Gate-source reverse voltage controls channel width and hence drain current.

Ref: Microelectronic Circuits – Adel S. Sedra and Kenneth C. Smith

15. The input impedance of a JFET is

- 1). Very low
- 2). Moderate
- 3). Very high
- 4). Zero

☒ Correct Answer: 3). Very high

Explanation:

Since gate junction is reverse biased, gate current is almost zero resulting in very high input impedance.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

16. The device exhibiting negative resistance characteristic is

- 1). BJT
- 2). UJT
- 3). MOSFET
- 4). SCR

☒ Correct Answer: 2). UJT

Explanation:

UJT shows negative resistance region between peak and valley points.

Ref: Pulse and Digital Circuits – A. Anand Kumar

17. The ripple factor of a half wave rectifier is

- 1). 0.482
- 2). 1.21
- 3). 0.707
- 4). 1.414

☒ Correct Answer: 2). 1.21

Explanation:

Half wave rectifier has high ripple because output exists only for half cycle.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

18. The ripple factor of a full wave rectifier is

- 1). 0.482
- 2). 1.21
- 3). 0.707
- 4). 0.1

☒ Correct Answer: 1). 0.482

Explanation:

Full wave rectifier reduces ripple since both halves of AC cycle contribute to output.

Ref: Electronic Devices and Circuits – David A. Bell

19. In a bridge rectifier the number of diodes used is

- 1). Two
- 2). Three
- 3). Four
- 4). Six

☒ Correct Answer: 3). Four

Explanation:

Bridge rectifier uses four diodes arranged in bridge configuration for full wave rectification.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

20. The maximum efficiency of a full wave rectifier is approximately

- 1). 40.6%
- 2). 50%

- 3). 81.2%
- 4). 100%

✓ Correct Answer: 3). 81.2%

Explanation:

Full wave rectifier efficiency is double that of half wave rectifier.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

21. The filter which uses capacitor and inductor combination is called

- 1). RC filter
- 2). LC filter
- 3). RL filter
- 4). π filter

✓ Correct Answer: 2). LC filter

Explanation:

LC filter uses inductor and capacitor to smooth ripple voltage in rectifiers.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

22. The CLC filter is commonly known as

- 1). T filter
- 2). π filter
- 3). RC filter
- 4). LC filter

✓ Correct Answer: 2). π filter

Explanation:

The arrangement of capacitor-inductor-capacitor resembles the Greek letter π .

Ref: Electronic Devices and Circuits – David A. Bell

23. A voltage regulator that uses transistor in series with load is called

- 1). Shunt regulator
- 2). Series regulator
- 3). Switching regulator
- 4). Zener regulator

✓ Correct Answer: 2). Series regulator

Explanation:

Series transistor regulates voltage by varying its resistance.

Ref: Electronic Principles – Albert Malvino and David J. Bates

24. In shunt regulator the regulating element is connected

- 1). In series with load
- 2). Parallel with load
- 3). In transformer
- 4). In rectifier

✓ Correct Answer: 2). Parallel with load

Explanation:

Shunt regulator diverts current from load to maintain constant voltage.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

25. The operating point of transistor is called

- 1). Bias point
- 2). Q-point
- 3). Breakdown point
- 4). Saturation point

✓ Correct Answer: 2). Q-point

Explanation:

Q-point represents the **DC operating condition** of transistor with no signal input.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

26. The main purpose of transistor biasing is to

- 1). Increase signal frequency
- 2). Stabilize operating point
- 3). Increase transistor size
- 4). Reduce input impedance

✓ Correct Answer: 2). Stabilize operating point

Explanation:

Biasing ensures the transistor operates in the **active region** for proper amplification and prevents distortion due to signal variations.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

27. The transistor configuration that provides the highest voltage gain is

- 1). Common Base
- 2). Common Collector
- 3). Common Emitter
- 4). Common Gate

✓ Correct Answer: 3). Common Emitter

Explanation:

Common emitter configuration provides **high voltage gain and current gain**, making it the most widely used amplifier configuration.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

28. In CE configuration the phase difference between input and output is

- 1). 0°
- 2). 90°
- 3). 180°
- 4). 360°

✓ Correct Answer: 3). 180°

Explanation:

In CE configuration output voltage is inverted relative to input signal, resulting in **180° phase shift**.

Ref: Electronic Principles – Albert Malvino and David J. Bates

29. The coupling method widely used in audio amplifiers is

- 1). RC coupling
- 2). Transformer coupling
- 3). Direct coupling
- 4). LC coupling

✓ Correct Answer: 1). RC coupling

Explanation:

RC coupling offers **good frequency response and low cost**, making it suitable for audio amplifiers.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

30. Transformer coupling is mainly used in

- 1). Voltage amplifiers
- 2). Power amplifiers
- 3). RF oscillators
- 4). Differential amplifiers

✓ Correct Answer: 2). Power amplifiers

Explanation:

Transformer coupling is used in power amplifiers for **impedance matching and maximum power transfer**.

Ref: Electronic Devices and Circuits – David A. Bell

31. A differential amplifier amplifies

- 1). Sum of input signals
- 2). Difference between two input signals
- 3). Average of inputs
- 4). Product of inputs

✓ Correct Answer: 2). Difference between two input signals

Explanation:

Differential amplifier produces output proportional to the **difference of two input voltages**.

Ref: Microelectronic Circuits – Adel S. Sedra and Kenneth C. Smith

32. Negative feedback in amplifiers results in

- 1). Increased distortion
- 2). Reduced bandwidth
- 3). Increased stability
- 4). Reduced input impedance

✓ Correct Answer: 3). Increased stability

Explanation:

Negative feedback improves **stability, bandwidth, and reduces distortion** in amplifiers.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

33. Power amplifiers are designed mainly to

- 1). Increase voltage gain
- 2). Deliver large power to load

- 3). Reduce noise
- 4). Increase frequency

✓ Correct Answer: 2). Deliver large power to load

Explanation:

Power amplifiers provide sufficient **power to drive loads such as speakers**.

Ref: Electronic Principles – Albert Malvino and David J. Bates

34. Tuned amplifiers are mainly used in

- 1). Audio circuits
- 2). Power supplies
- 3). RF communication systems
- 4). Voltage regulators

✓ Correct Answer: 3). RF communication systems

Explanation:

Tuned amplifiers select and amplify a **specific frequency using LC resonant circuits**.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

35. An ideal operational amplifier has

- 1). Infinite input impedance
- 2). Zero input impedance
- 3). Low gain
- 4). High output impedance

✓ Correct Answer: 1). Infinite input impedance

Explanation:

Infinite input impedance ensures **no current is drawn from input source**.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

36. The ideal output impedance of an operational amplifier is

- 1). Infinite
- 2). Very high
- 3). Zero
- 4). Moderate

✓ Correct Answer: 3). Zero

Explanation:

Zero output impedance allows maximum transfer of output voltage to the load.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

37. The open loop gain of an ideal op-amp is

- 1). Zero
- 2). One
- 3). Infinite
- 4). 100

✓ Correct Answer: 3). Infinite

Explanation:

Ideal op-amp is assumed to have **infinite open-loop gain** to simplify circuit analysis.

Ref: Linear Integrated Circuits – D. Roy Choudhury and Shail B. Jain

38. RC oscillators are commonly used to generate

- 1). Microwave frequencies
- 2). Audio frequencies
- 3). Optical frequencies
- 4). DC voltage

✓ Correct Answer: 2). Audio frequencies

Explanation:

RC oscillators operate effectively in **low frequency or audio frequency range**.

Ref: Electronic Principles – Albert Malvino and David J. Bates

39. The oscillator which provides highest frequency stability is

- 1). LC oscillator
- 2). RC oscillator
- 3). Crystal oscillator
- 4). Hartley oscillator

✓ Correct Answer: 3). Crystal oscillator

Explanation:

Quartz crystal has **very high Q factor**, providing extremely stable frequency.

Ref: Microelectronic Circuits – Adel S. Sedra and Kenneth C. Smith

40. An astable multivibrator has

- 1). One stable state
- 2). Two stable states
- 3). No stable state
- 4). Infinite stable states

✓ Correct Answer: 3). No stable state

Explanation:

Astable multivibrator continuously switches between two states producing a square wave.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

41. A bistable multivibrator is also known as

- 1). Flip-flop
- 2). Oscillator
- 3). Rectifier
- 4). Integrator

✓ Correct Answer: 1). Flip-flop

Explanation:

Bistable circuit has **two stable states** and is widely used in memory elements.

Ref: Pulse and Digital Circuits – A. Anand Kumar

42. A monostable multivibrator has

- 1). One stable state
- 2). Two stable states
- 3). No stable state
- 4). Three stable states

✓ Correct Answer: 1). One stable state

Explanation:

Monostable circuit generates **a single pulse for each trigger input**.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

43. In a 555 timer the trigger level is

- 1). VCC
- 2). $V_{CC}/2$
- 3). $V_{CC}/3$
- 4). $2V_{CC}/3$

✓ Correct Answer: 3). $V_{CC}/3$

Explanation:

Trigger comparator activates when input voltage drops below $1/3 V_{CC}$.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

44. In a 555 timer the threshold level is

- 1). $V_{CC}/2$
- 2). $V_{CC}/3$
- 3). $2V_{CC}/3$
- 4). V_{CC}

✓ Correct Answer: 3). $2V_{CC}/3$

Explanation:

Upper comparator resets the flip-flop when capacitor voltage exceeds $2/3 V_{CC}$.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

45. Schmitt trigger is mainly used for

- 1). Signal rectification
- 2). Wave shaping
- 3). Frequency multiplication
- 4). Voltage regulation

✓ Correct Answer: 2). Wave shaping

Explanation:

Schmitt trigger converts noisy signals into **clean square wave signals**.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

46. The hysteresis in Schmitt trigger helps to

- 1). Increase gain
- 2). Improve noise immunity
- 3). Reduce frequency
- 4). Increase distortion

✓ Correct Answer: 2). Improve noise immunity

Explanation:

Hysteresis prevents unwanted switching caused by small noise fluctuations.

Ref: Pulse and Digital Circuits – A. Anand Kumar

47. Sweep circuits are mainly used in

- 1). Power supplies
- 2). Time base generators in CRO
- 3). Voltage regulators
- 4). Rectifier circuits

✅ Correct Answer: 2). Time base generators in CRO

Explanation:

Sweep circuits generate **linearly increasing voltage (ramp)** required for horizontal deflection.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

48. A Miller sweep circuit produces

- 1). Sinusoidal waveform
- 2). Linear ramp waveform
- 3). Square waveform
- 4). Triangular waveform

✅ Correct Answer: 2). Linear ramp waveform

Explanation:

Miller integrator converts step input into **linear ramp output**.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

49. Bootstrap sweep circuit is used to

- 1). Reduce gain
- 2). Improve sweep linearity
- 3). Increase noise
- 4). Reduce output impedance

✅ Correct Answer: 2). Improve sweep linearity

Explanation:

Bootstrap technique maintains nearly constant charging current producing **linear sweep voltage**.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

50. The transistor region used for faithful amplification is

- 1). Cut-off region
- 2). Saturation region

- 3). Active region
- 4). Breakdown region

✓ Correct Answer: 3). Active region

Explanation:

In active region transistor behaves linearly enabling **accurate signal amplification**.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

51. The peak inverse voltage (PIV) of a diode in a half wave rectifier is

- 1). V_m
- 2). $V_m/2$
- 3). $2V_m$
- 4). $V_m/4$

✓ Correct Answer: 1). V_m

Explanation:

In half wave rectifier the diode must withstand the **maximum secondary voltage during reverse half cycle**.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

52. The PIV of each diode in a bridge rectifier is

- 1). V_m
- 2). $V_m/2$
- 3). $2V_m$
- 4). $4V_m$

✓ Correct Answer: 1). V_m

Explanation:

In bridge rectifier each diode experiences a maximum reverse voltage equal to the peak secondary voltage.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

53. The efficiency of a half wave rectifier is approximately

- 1). 40.6%
- 2). 50%
- 3). 60%
- 4). 81.2%

✓ Correct Answer: 1). 40.6%

Explanation:

Half wave rectifier utilizes only one half cycle of AC supply resulting in low rectification efficiency.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

54. The ripple frequency of a half wave rectifier is

- 1). f
- 2). $2f$
- 3). $3f$
- 4). $4f$

☒ Correct Answer: 1). f

Explanation:

Since only one half cycle appears at output, ripple frequency is equal to the input AC frequency.

Ref: Electronic Devices and Circuits – David A. Bell

55. The ripple frequency of a full wave rectifier is

- 1). f
- 2). $2f$
- 3). $3f$
- 4). $4f$

☒ Correct Answer: 2). $2f$

Explanation:

Full wave rectifier uses both halves of AC cycle therefore ripple frequency becomes twice the supply frequency.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

56. The purpose of a filter in power supply is to

- 1). Increase ripple
- 2). Reduce ripple
- 3). Increase frequency
- 4). Increase voltage gain

☒ Correct Answer: 2). Reduce ripple

Explanation:

Filters smooth the pulsating DC from rectifiers by reducing ripple components.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

57. A capacitor filter works on the principle of

- 1). Inductive reactance
- 2). Energy storage
- 3). Resistance variation
- 4). Thermal conduction

✓ Correct Answer: 2). Energy storage

Explanation:

Capacitor charges during peak voltage and discharges slowly maintaining smooth DC output.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

58. The main advantage of LC filter over RC filter is

- 1). Smaller size
- 2). Better ripple reduction
- 3). Lower cost
- 4). Lower weight

✓ Correct Answer: 2). Better ripple reduction

Explanation:

Inductor opposes ripple current while capacitor bypasses AC components providing better filtering.

Ref: Electronic Devices and Circuits – David A. Bell

59. In a CE amplifier voltage gain is approximately

- 1). R_C / R_E
- 2). R_E / R_C
- 3). $R_C \times R_E$
- 4). $R_C + R_E$

✓ Correct Answer: 1). R_C / R_E

Explanation:

Voltage gain of CE amplifier is approximately equal to collector resistance divided by emitter resistance.

Ref: Microelectronic Circuits – Adel S. Sedra and Kenneth C. Smith

60. The emitter follower amplifier has voltage gain approximately

- 1). Zero
- 2). One
- 3). Greater than 10
- 4). Infinite

✓ Correct Answer: 2). One

Explanation:

Common collector configuration provides **unity voltage gain** but high current gain.

Ref: Electronic Principles – Albert Malvino and David J. Bates

61. The input impedance of CE amplifier is

- 1). Very high
- 2). Low
- 3). Moderate
- 4). Zero

✓ Correct Answer: 3). Moderate

Explanation:

CE amplifier has moderate input impedance due to base-emitter junction characteristics.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

62. The differential amplifier rejects

- 1). Differential signals
- 2). Common mode signals
- 3). AC signals
- 4). DC signals

✓ Correct Answer: 2). Common mode signals

Explanation:

Differential amplifiers amplify difference signals while rejecting signals common to both inputs.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

63. The parameter used to measure common signal rejection is

- 1). Gain factor
- 2). CMRR
- 3). Beta factor
- 4). Ripple factor

✓ Correct Answer: 2). CMRR

Explanation:

Common Mode Rejection Ratio indicates the ability of amplifier to reject common signals.

Ref: Microelectronic Circuits – Adel S. Sedra and Kenneth C. Smith

64. Positive feedback in amplifier results in

- 1). Reduced gain
- 2). Increased stability
- 3). Oscillation
- 4). Reduced distortion

✓ Correct Answer: 3). Oscillation

Explanation:

Positive feedback reinforces input signal and can lead to sustained oscillations.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

65. The amplifier class with highest efficiency is

- 1). Class A
- 2). Class B
- 3). Class AB
- 4). Class C

✓ Correct Answer: 4). Class C

Explanation:

Class C amplifiers conduct for less than half cycle resulting in highest efficiency but high distortion.

Ref: Electronic Principles – Albert Malvino and David J. Bates

66. Class A amplifier conduction angle is

- 1). 90°
- 2). 180°
- 3). 270°
- 4). 360°

✓ Correct Answer: 4). 360°

Explanation:

Class A amplifier conducts for entire input signal cycle providing minimal distortion.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

67. The class B amplifier conduction angle is

- 1). 90°
- 2). 180°
- 3). 270°
- 4). 360°

☒ Correct Answer: 2). 180°

Explanation:

Class B amplifier conducts for half of the input cycle.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

68. The crossover distortion occurs in

- 1). Class A amplifier
- 2). Class B amplifier
- 3). Class C amplifier
- 4). Differential amplifier

☒ Correct Answer: 2). Class B amplifier

Explanation:

Crossover distortion occurs near zero crossing when both transistors momentarily turn off.

Ref: Electronic Principles – Albert Malvino and David J. Bates

69. Tuned amplifiers use

- 1). RC network
- 2). LC resonant circuit
- 3). RL circuit
- 4). Diode circuit

☒ Correct Answer: 2). LC resonant circuit

Explanation:

LC circuit selects and amplifies a particular frequency.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

70. The resonant frequency of LC circuit is

- 1). $1 / (2\pi LC)$
- 2). $1 / (2\pi\sqrt{LC})$

- 3). $2\pi\sqrt{LC}$
- 4). $\sqrt{LC}$

✓ Correct Answer: 2). $1 / (2\pi\sqrt{LC})$

Explanation:

Resonant frequency depends on inductance and capacitance of tuned circuit.

Ref: Microelectronic Circuits – Adel S. Sedra and Kenneth C. Smith

71. The Wien bridge oscillator uses

- 1). RC network
- 2). LC network
- 3). Crystal network
- 4). Transformer network

✓ Correct Answer: 1). RC network

Explanation:

Wien bridge oscillator uses RC lead-lag network to generate stable sinusoidal output.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

72. The Hartley oscillator uses

- 1). Two capacitors
- 2). Two inductors
- 3). Two resistors
- 4). Two transistors

✓ Correct Answer: 2). Two inductors

Explanation:

Hartley oscillator uses tapped inductor or two inductors for feedback.

Ref: Electronic Principles – Albert Malvino and David J. Bates

73. The Colpitts oscillator uses

- 1). Two capacitors
- 2). Two inductors
- 3). Two resistors
- 4). Two transistors

✓ Correct Answer: 1). Two capacitors

Explanation:

Colpitts oscillator uses capacitive voltage divider for feedback.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

74. The quality factor of crystal oscillator is

- 1). Very low
- 2). Moderate
- 3). Very high
- 4). Zero

✓ Correct Answer: 3). Very high

Explanation:

Quartz crystals provide very high Q factor resulting in extremely stable oscillations.

Ref: Microelectronic Circuits – Adel S. Sedra and Kenneth C. Smith

75. The 555 timer contains

- 1). One comparator
- 2). Two comparators
- 3). Three comparators
- 4). Four comparators

✓ Correct Answer: 2). Two comparators

Explanation:

555 timer includes two comparators, a flip-flop and discharge transistor.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

76. The discharge transistor in a 555 timer is connected to

- 1). Pin 1
- 2). Pin 7
- 3). Pin 5
- 4). Pin 3

✓ Correct Answer: 2). Pin 7

Explanation:

The discharge transistor connected to **pin 7** discharges the timing capacitor during the operation of astable or monostable circuits.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

77. The output pin of the 555 timer IC is

- 1). Pin 1
- 2). Pin 3
- 3). Pin 5
- 4). Pin 8

✓ Correct Answer: 2). Pin 3

Explanation:

Pin 3 of the 555 timer provides the **output signal** of the timer circuit.

Ref: Linear Integrated Circuits – D. Roy Choudhury and Shail B. Jain

78. The reset pin of a 555 timer is

- 1). Pin 2
- 2). Pin 3
- 3). Pin 4
- 4). Pin 6

✓ Correct Answer: 3). Pin 4

Explanation:

Reset pin is used to **reset the flip-flop inside the IC**, forcing the output to low state.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

79. The frequency of an astable multivibrator using 555 timer is

- 1). $1 / (0.693(RA + RB)C)$
- 2). $1 / (0.693(RA + 2RB)C)$
- 3). $1 / (RA + RB)C$
- 4). $1 / RC$

✓ Correct Answer: 2). $1 / (0.693(RA + 2RB)C)$

Explanation:

The time period of astable multivibrator depends on charging and discharging time of capacitor through RA and RB.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

80. The duty cycle of a symmetrical astable multivibrator is approximately

- 1). 25%
- 2). 50%
- 3). 75%
- 4). 100%

✓ Correct Answer: 2). 50%

Explanation:

Symmetrical waveform has equal high and low durations resulting in **50% duty cycle**.

Ref: Pulse and Digital Circuits – A. Anand Kumar

81. The main application of Schmitt trigger is

- 1). Amplification
- 2). Wave shaping
- 3). Rectification
- 4). Voltage regulation

✓ Correct Answer: 2). Wave shaping

Explanation:

Schmitt trigger converts distorted input into clean square wave output.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

82. The upper threshold voltage of Schmitt trigger is called

- 1). UTP
- 2). LTP
- 3). RTP
- 4). DTP

✓ Correct Answer: 1). UTP

Explanation:

Upper threshold point is the voltage level at which output switches state.

Ref: Pulse and Digital Circuits – A. Anand Kumar

83. The difference between upper and lower threshold voltages is called

- 1). Hysteresis voltage
- 2). Gain voltage
- 3). Cut-off voltage
- 4). Breakdown voltage

✓ Correct Answer: 1). Hysteresis voltage

Explanation:

Hysteresis improves noise immunity by preventing false triggering.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

84. Sweep circuits generate

- 1). Square waveform
- 2). Sinusoidal waveform
- 3). Ramp waveform
- 4). Random waveform

✓ Correct Answer: 3). Ramp waveform

Explanation:

Sweep circuits produce a **linearly increasing ramp voltage** used in oscilloscopes.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

85. The Miller sweep circuit uses

- 1). Integrator principle
- 2). Differentiator principle
- 3). Rectifier principle
- 4). Amplifier principle

✓ Correct Answer: 1). Integrator principle

Explanation:

Miller integrator converts step input into linear ramp output.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

86. Bootstrap circuit is mainly used to

- 1). Improve sweep linearity
- 2). Increase gain
- 3). Reduce frequency
- 4). Increase ripple

✓ Correct Answer: 1). Improve sweep linearity

Explanation:

Bootstrap circuit maintains constant charging current producing highly linear ramp waveform.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

87. The DC load line of transistor represents

- 1). AC operation
- 2). Saturation current only
- 3). Possible operating points of transistor
- 4). Only base current

✓ Correct Answer: 3). Possible operating points of transistor

Explanation:

Load line shows all possible combinations of I_C and V_{CE} for given load resistor.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

88. The stability factor of transistor biasing indicates

- 1). Temperature stability
- 2). Frequency stability
- 3). Voltage stability
- 4). Power stability

✓ Correct Answer: 1). Temperature stability

Explanation:

Stability factor shows sensitivity of collector current to temperature variations.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

89. The biasing method with best thermal stability is

- 1). Fixed bias
- 2). Collector feedback bias
- 3). Voltage divider bias
- 4). Emitter bias

✓ Correct Answer: 3). Voltage divider bias

Explanation:

Voltage divider bias provides stable Q-point against temperature variations.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

90. In CE amplifier the output is taken from

- 1). Base
- 2). Collector
- 3). Emitter
- 4). Ground

✓ Correct Answer: 2). Collector

Explanation:

Input is applied to base and output is taken from collector terminal.

Ref: Electronic Devices and Circuits – David A. Bell

91. The voltage gain of a CE amplifier is generally

- 1). Less than unity
- 2). Equal to unity
- 3). Greater than unity
- 4). Zero

✓ Correct Answer: 3). Greater than unity

Explanation:

CE amplifier provides both current and voltage amplification.

Ref: Electronic Principles – Albert Malvino and David J. Bates

92. In CB configuration the current gain is

- 1). Less than unity
- 2). Greater than unity
- 3). Equal to zero
- 4). Infinite

✓ Correct Answer: 1). Less than unity

Explanation:

Current gain $\alpha = I_C / I_E$ and is slightly less than 1.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

93. The main advantage of CC configuration is

- 1). High voltage gain
- 2). High current gain
- 3). Low frequency response
- 4). High distortion

✓ Correct Answer: 2). High current gain

Explanation:

Emitter follower provides large current gain with unity voltage gain.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

94. The purpose of coupling capacitor in RC amplifier is to

- 1). Increase gain
- 2). Block DC component
- 3). Increase frequency
- 4). Reduce noise

✓ Correct Answer: 2). Block DC component

Explanation:

Coupling capacitor blocks DC bias while allowing AC signal to pass.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

95. The bypass capacitor in amplifier circuit is used to

- 1). Reduce voltage gain
- 2). Increase AC gain
- 3). Reduce frequency
- 4). Increase noise

✓ Correct Answer: 2). Increase AC gain

Explanation:

Emitter bypass capacitor provides low reactance path for AC signal increasing gain.

Ref: Electronic Principles – Albert Malvino and David J. Bates

96. The transistor configuration most widely used in amplifiers is

- 1). Common base
- 2). Common emitter
- 3). Common collector
- 4). Common gate

✓ Correct Answer: 2). Common emitter

Explanation:

CE configuration provides good voltage gain, current gain and moderate impedance.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

97. The gain of an ideal inverting op-amp is

- 1). R_f / R_{in}
- 2). R_{in} / R_f

3). $-(R_f / R_{in})$

4). $-(R_{in} / R_f)$

✓ Correct Answer: 3). $-(R_f / R_{in})$

Explanation:

Inverting amplifier produces output opposite in phase to input.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

98. The gain of non-inverting op-amp is

1). $1 + (R_f / R_{in})$

2). R_f / R_{in}

3). R_{in} / R_f

4). 1

✓ Correct Answer: 1). $1 + (R_f / R_{in})$

Explanation:

Non-inverting amplifier provides gain greater than or equal to unity.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

99. The op-amp circuit used to perform mathematical integration is

1). Integrator

2). Differentiator

3). Comparator

4). Multiplier

✓ Correct Answer: 1). Integrator

Explanation:

Integrator produces output proportional to time integral of input signal.

Ref: Linear Integrated Circuits – D. Roy Choudhury and Shail B. Jain

100. The op-amp circuit used to perform differentiation is

1). Integrator

2). Differentiator

3). Oscillator

4). Amplifier

✓ Correct Answer: 2). Differentiator

Explanation:

Differentiator produces output proportional to rate of change of input voltage.

Ref: Linear Integrated Circuits – D. Roy Choudhury and Shail B. Jain

101. The DC output voltage of a half wave rectifier with peak voltage V_m is approximately

- 1). V_m / π
- 2). $V_m / 2$
- 3). $2V_m / \pi$
- 4). V_m

✓ Correct Answer: 1). V_m / π

Explanation:

The average output voltage of a half wave rectifier is given by

$$V_{dc} = V_m / \pi.$$

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

102. The DC output voltage of a full wave rectifier with peak voltage V_m is

- 1). V_m / π
- 2). $V_m / 2$
- 3). $2V_m / \pi$
- 4). V_m

✓ Correct Answer: 3). $2V_m / \pi$

Explanation:

Full wave rectifier utilizes both halves of AC cycle resulting in double DC output compared to half wave rectifier.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

103. The ripple factor of a capacitor filter decreases when

- 1). Load resistance decreases
- 2). Capacitance decreases
- 3). Capacitance increases
- 4). Frequency decreases

✓ Correct Answer: 3). Capacitance increases

Explanation:

Higher capacitance stores more charge and reduces ripple voltage in filtered output.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

104. If the input frequency of a half wave rectifier is 50 Hz, the ripple frequency will be

- 1). 25 Hz
- 2). 50 Hz
- 3). 100 Hz
- 4). 150 Hz

☒ Correct Answer: 2). 50 Hz

Explanation:

Ripple frequency of half wave rectifier equals the input AC frequency.

Ref: Electronic Devices and Circuits – David A. Bell

105. If the input frequency of a full wave rectifier is 50 Hz, the ripple frequency will be

- 1). 50 Hz
- 2). 75 Hz
- 3). 100 Hz
- 4). 150 Hz

☒ Correct Answer: 3). 100 Hz

Explanation:

Full wave rectifier produces ripple frequency twice the input AC frequency.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

106. If β of a transistor is 100 and base current is 20 μA , the collector current is

- 1). 2 mA
- 2). 20 mA
- 3). 200 mA
- 4). 0.2 mA

☒ Correct Answer: 1). 2 mA

Explanation:

$$I_C = \beta \times I_B$$

$$I_C = 100 \times 20 \mu\text{A} = 2000 \mu\text{A} = 2 \text{ mA}.$$

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

107. If α of a transistor is 0.98, the approximate value of β is

- 1). 25
- 2). 49
- 3). 75
- 4). 100

✓ Correct Answer: 2). 49

Explanation:

$$\beta = \alpha / (1 - \alpha)$$

$$\beta = 0.98 / 0.02 = 49.$$

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

108. The voltage gain of a CE amplifier with $RC = 4\text{ k}\Omega$ and $RE = 1\text{ k}\Omega$ is approximately

- 1). 2
- 2). 4
- 3). 6
- 4). 8

✓ Correct Answer: 2). 4

Explanation:

$$\text{Voltage gain} \approx RC / RE$$

$$= 4\text{k} / 1\text{k} = 4.$$

Ref: Microelectronic Circuits – Adel S. Sedra and Kenneth C. Smith

109. If $RC = 10\text{ k}\Omega$ and $RE = 2\text{ k}\Omega$ in CE amplifier, the voltage gain is

- 1). 3
- 2). 5
- 3). 10
- 4). 20

✓ Correct Answer: 2). 5

Explanation:

$$\text{Voltage gain} \approx RC / RE$$

$$= 10\text{k} / 2\text{k} = 5.$$

Ref: Electronic Principles – Albert Malvino and David J. Bates

110. The resonant frequency of an LC circuit with $L = 1\text{ mH}$ and $C = 1\text{ }\mu\text{F}$ is approximately

- 1). 1.6 kHz
- 2). 5 kHz

- 3). 10 kHz
- 4). 15 kHz

✓ Correct Answer: 2). 5 kHz

Explanation:

$$f_r = 1 / (2\pi\sqrt{LC})$$

$$\approx 1 / (2\pi\sqrt{(10^{-3} \times 10^{-6})}) \approx 5 \text{ kHz.}$$

Ref: Microelectronic Circuits – Adel S. Sedra and Kenneth C. Smith

111. If $R_f = 100 \text{ k}\Omega$ and $R_{in} = 10 \text{ k}\Omega$ in an inverting amplifier, the gain is

- 1). -5
- 2). -10
- 3). -20
- 4). -50

✓ Correct Answer: 2). -10

Explanation:

$$\text{Gain} = -R_f / R_{in}$$

$$= -100\text{k} / 10\text{k} = -10.$$

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

112. If $R_f = 20 \text{ k}\Omega$ and $R_{in} = 5 \text{ k}\Omega$ in an inverting amplifier, the gain is

- 1). -2
- 2). -3
- 3). -4
- 4). -5

✓ Correct Answer: 3). -4

Explanation:

$$\text{Gain} = -R_f / R_{in}$$

$$= -20\text{k} / 5\text{k} = -4.$$

Ref: Linear Integrated Circuits – D. Roy Choudhury and Shail B. Jain

113. The gain of a non-inverting amplifier with $R_f = 9 \text{ k}\Omega$ and $R_{in} = 1 \text{ k}\Omega$ is

- 1). 5
- 2). 9
- 3). 10
- 4). 11

✓ Correct Answer: 3). 10

Explanation:

$$\begin{aligned}\text{Gain} &= 1 + (R_f / R_{in}) \\ &= 1 + (9/1) = 10.\end{aligned}$$

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

114. The time period of a 555 monostable multivibrator is

- 1). 0.693 RC
- 2). 1.1 RC
- 3). RC
- 4). 2RC

✓ Correct Answer: 2). 1.1 RC

Explanation:

Pulse width in monostable operation is
 $T = 1.1 RC$.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

115. If $R = 100 \text{ k}\Omega$ and $C = 10 \text{ }\mu\text{F}$ in a 555 monostable circuit, pulse width is

- 1). 0.11 s
- 2). 1.1 s
- 3). 2.2 s
- 4). 11 s

✓ Correct Answer: 2). 1.1 s

Explanation:

$$\begin{aligned}T &= 1.1RC \\ &= 1.1 \times 100\text{k} \times 10\mu\text{F} = 1.1 \text{ s}.\end{aligned}$$

Ref: Linear Integrated Circuits – D. Roy Choudhury and Shail B. Jain

116. If $R_A = 10 \text{ k}\Omega$, $R_B = 10 \text{ k}\Omega$ and $C = 0.1 \text{ }\mu\text{F}$ in astable 555 timer, frequency is approximately

- 1). 480 Hz
- 2). 720 Hz
- 3). 960 Hz
- 4). 1200 Hz

✓ Correct Answer: 1). 480 Hz

Explanation:

$$f = 1 / (0.693(RA + 2RB)C)$$

$$\approx 480 \text{ Hz.}$$

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

117. The duty cycle of astable multivibrator is

- 1). $(RA + RB) / (RA + 2RB)$
- 2). $RB / (RA + RB)$
- 3). RA / RB
- 4). RB / RA

☒ Correct Answer: 1). $(RA + RB) / (RA + 2RB)$

Explanation:

Duty cycle represents ratio of ON time to total time period.

Ref: Pulse and Digital Circuits – A. Anand Kumar

118. If $RA = RB$ in astable 555 timer, duty cycle is approximately

- 1). 33%
- 2). 50%
- 3). 66%
- 4). 75%

☒ Correct Answer: 3). 66%

Explanation:

$$\text{Duty cycle} = (RA + RB) / (RA + 2RB)$$

$$= (2R / 3R) = 66\%.$$

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

119. The main advantage of differential amplifier is

- 1). High power gain
- 2). Noise rejection
- 3). High distortion
- 4). Low bandwidth

☒ Correct Answer: 2). Noise rejection

Explanation:

Differential amplifiers reject common mode noise signals.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

120. The most stable oscillator among the following is

- 1). RC oscillator
- 2). LC oscillator
- 3). Crystal oscillator
- 4). Hartley oscillator

☒ Correct Answer: 3). Crystal oscillator

Explanation:

Crystal oscillators have extremely high Q factor providing stable frequency.

Ref: Microelectronic Circuits – Adel S. Sedra and Kenneth C. Smith

121. The frequency stability of oscillator depends mainly on

- 1). Resistance
- 2). Quality factor
- 3). Temperature only
- 4). Supply voltage

☒ Correct Answer: 2). Quality factor

Explanation:

Higher Q factor provides better frequency stability.

Ref: Electronic Principles – Albert Malvino and David J. Bates

122. The purpose of feedback network in oscillator is

- 1). Reduce gain
- 2). Sustain oscillations
- 3). Increase noise
- 4). Reduce frequency

☒ Correct Answer: 2). Sustain oscillations

Explanation:

Positive feedback compensates energy loss maintaining continuous oscillations.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

123. The Barkhausen criterion for oscillation is

- 1). Gain < 1
- 2). Gain = 1 and phase shift 0° or 360°

- 3). Gain > 10
- 4). Phase shift 90°

✓ Correct Answer: 2). Gain = 1 and phase shift 0° or 360°

Explanation:

Oscillations occur when loop gain equals unity and total phase shift is zero.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

124. In RC phase shift oscillator the phase shift provided by RC network is

- 1). 60°
- 2). 120°
- 3). 180°
- 4). 360°

✓ Correct Answer: 3). 180°

Explanation:

Three RC sections provide 180° phase shift while amplifier provides additional 180° .

Ref: Electronic Principles – Albert Malvino and David J. Bates

125. The transistor used in oscillator acts as

- 1). Rectifier
- 2). Amplifier
- 3). Filter
- 4). Detector

✓ Correct Answer: 2). Amplifier

Explanation:

Active device provides necessary gain to sustain oscillations.

Ref: Electronic Devices and Circuits – David A. Bell

126. The sweep voltage waveform is generally

- 1). Exponential
- 2). Linear ramp
- 3). Square
- 4). Sinusoidal

✓ Correct Answer: 2). Linear ramp

Explanation:

Sweep circuits generate ramp waveform for horizontal deflection.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

127. In Miller sweep circuit the capacitor charges through

- 1). Constant voltage
- 2). Constant current
- 3). Exponential current
- 4). Random current

☒ Correct Answer: 2). Constant current

Explanation:

Constant current charging produces linear voltage ramp.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

128. The bootstrap circuit maintains

- 1). Constant voltage
- 2). Constant current
- 3). Constant resistance
- 4). Constant power

☒ Correct Answer: 2). Constant current

Explanation:

Bootstrap circuit provides nearly constant current for linear ramp generation.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

129. The voltage follower circuit is also called

- 1). Inverting amplifier
- 2). Non-inverting amplifier
- 3). Buffer amplifier
- 4). Differential amplifier

☒ Correct Answer: 3). Buffer amplifier

Explanation:

Voltage follower provides unity gain with high input impedance.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

130. The main advantage of voltage follower is

- 1). High voltage gain
- 2). High current gain
- 3). Impedance matching
- 4). Frequency conversion

✓ Correct Answer: 3). Impedance matching

Explanation:

Voltage follower isolates source from load preventing loading effect.

Ref: Linear Integrated Circuits – D. Roy Choudhury and Shail B. Jain

131. The input impedance of ideal op-amp is

- 1). Zero
- 2). Very low
- 3). Infinite
- 4). Moderate

✓ Correct Answer: 3). Infinite

Explanation:

Ideal op-amp does not draw input current.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

132. The output impedance of ideal op-amp is

- 1). Infinite
- 2). Zero
- 3). High
- 4). Moderate

✓ Correct Answer: 2). Zero

Explanation:

Zero output impedance ensures maximum voltage transfer.

Ref: Linear Integrated Circuits – D. Roy Choudhury and Shail B. Jain

133. The bandwidth of amplifier increases with

- 1). Positive feedback
- 2). Negative feedback
- 3). No feedback
- 4). High temperature

✓ Correct Answer: 2). Negative feedback

Explanation:

Negative feedback improves bandwidth and stability.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

134. The distortion in amplifier reduces with

- 1). Positive feedback
- 2). Negative feedback
- 3). High voltage
- 4). High current

✓ Correct Answer: 2). Negative feedback

Explanation:

Negative feedback linearizes amplifier characteristics.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

135. The gain of emitter follower is approximately

- 1). 0
- 2). 1
- 3). 10
- 4). 100

✓ Correct Answer: 2). 1

Explanation:

Emitter follower provides unity voltage gain.

Ref: Electronic Principles – Albert Malvino and David J. Bates

136. The main disadvantage of transformer coupled amplifier is

- 1). Poor frequency response
- 2). High gain
- 3). Low distortion
- 4). High bandwidth

✓ Correct Answer: 1). Poor frequency response

Explanation:

Transformer coupling limits frequency response especially at high frequencies.

Ref: Electronic Devices and Circuits – David A. Bell

137. The input resistance of CB amplifier is

- 1). High
- 2). Very high
- 3). Low
- 4). Infinite

☒ Correct Answer: 3). Low

Explanation:

Emitter-base junction presents low resistance path.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

138. The output resistance of CB amplifier is

- 1). Low
- 2). Moderate
- 3). High
- 4). Zero

☒ Correct Answer: 3). High

Explanation:

Collector terminal provides high output resistance.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

139. The transistor used as switch operates in

- 1). Active region
- 2). Saturation and cutoff regions
- 3). Breakdown region
- 4). Linear region

☒ Correct Answer: 2). Saturation and cutoff regions

Explanation:

Transistor acts like ON-OFF switch between cutoff and saturation.

Ref: Electronic Principles – Albert Malvino and David J. Bates

140. The base current required for switching transistor ON is

- 1). Zero
- 2). Very small

- 3). Moderate
- 4). Very large

☒ Correct Answer: 2). Very small

Explanation:

Small base current controls large collector current due to current gain.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

141. The main purpose of emitter resistor in biasing circuit is

- 1). Increase gain
- 2). Improve stability
- 3). Increase voltage
- 4). Reduce frequency

☒ Correct Answer: 2). Improve stability

Explanation:

Emitter resistor provides negative feedback stabilizing operating point.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

142. Thermal runaway in transistor occurs due to

- 1). Temperature increase
- 2). Frequency decrease
- 3). Voltage decrease
- 4). Current decrease

☒ Correct Answer: 1). Temperature increase

Explanation:

Increase in temperature increases leakage current leading to further heating.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

143. The device used for voltage controlled capacitance is

- 1). Zener diode
- 2). Varactor diode
- 3). Tunnel diode
- 4). Photo diode

☒ Correct Answer: 2). Varactor diode

Explanation:

Varactor diode capacitance varies with reverse bias voltage.

Ref: Electronic Devices and Circuits – David A. Bell

144. The region of Zener diode operation used for voltage regulation is

- 1). Forward bias
- 2). Reverse breakdown
- 3). Cutoff
- 4). Active region

☒ Correct Answer: 2). Reverse breakdown

Explanation:

Zener diode maintains constant voltage in breakdown region.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

145. The clipper circuit mainly uses

- 1). Diode
- 2). Transistor
- 3). Capacitor
- 4). Inductor

☒ Correct Answer: 1). Diode

Explanation:

Diodes are used to clip unwanted portions of waveform.

Ref: Electronic Principles – Albert Malvino and David J. Bates

146. The clamper circuit requires

- 1). Diode only
- 2). Capacitor only
- 3). Diode and capacitor
- 4). Transistor and resistor

☒ Correct Answer: 3). Diode and capacitor

Explanation:

Clamper uses diode and capacitor to shift DC level of waveform.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

147. The input stage of most op-amps is

- 1). Differential amplifier
- 2). Power amplifier
- 3). Oscillator
- 4). Rectifier

✓ Correct Answer: 1). Differential amplifier

Explanation:

Differential input stage provides high input impedance and noise rejection.

Ref: Microelectronic Circuits – Adel S. Sedra and Kenneth C. Smith

148. The output stage of op-amp is

- 1). Voltage follower
- 2). Power amplifier
- 3). Differential amplifier
- 4). Oscillator

✓ Correct Answer: 2). Power amplifier

Explanation:

Output stage drives load providing sufficient current capability.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

149. The oscillator that uses LC tank circuit is

- 1). Wien bridge oscillator
- 2). Hartley oscillator
- 3). Phase shift oscillator
- 4). RC oscillator

✓ Correct Answer: 2). Hartley oscillator

Explanation:

Hartley oscillator uses inductive voltage divider and LC tank circuit.

Ref: Electronic Principles – Albert Malvino and David J. Bates

150. The oscillator that uses quartz crystal is called

- 1). RC oscillator
- 2). LC oscillator
- 3). Crystal oscillator
- 4). Phase shift oscillator

✓ Correct Answer: 3). Crystal oscillator

Explanation:

Quartz crystal provides extremely stable oscillations due to high Q factor.

Ref: Microelectronic Circuits – Adel S. Sedra and Kenneth C. Smith

UNIT 2: CIRCUIT THEORY

1. Kirchhoff's Current Law (KCL) is based on

- 1). Conservation of energy
- 2). Conservation of charge
- 3). Ohm's law
- 4). Faraday's law

✓ Correct Answer: 2). Conservation of charge

Explanation:

KCL states that the algebraic sum of currents at a node is zero, which follows the **law of conservation of charge**.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

2. Kirchhoff's Voltage Law (KVL) is based on

- 1). Conservation of charge
- 2). Conservation of energy
- 3). Faraday's law
- 4). Ohm's law

✓ Correct Answer: 2). Conservation of energy

Explanation:

KVL states that the algebraic sum of voltages in any closed loop is zero, derived from **conservation of energy**.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

3. In mesh analysis the unknown variables are

- 1). Voltages
- 2). Currents
- 3). Powers
- 4). Resistances

✓ Correct Answer: 2). Currents

Explanation:

Mesh analysis determines **mesh currents** using KVL equations.

Ref: Network Analysis – M.E. Van Valkenburg

4. Node voltage analysis is based on

- 1). KVL
- 2). KCL
- 3). Ohm's law
- 4). Superposition theorem

✓ Correct Answer: 2). KCL

Explanation:

Node analysis uses **Kirchhoff's Current Law** to determine node voltages.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

5. A node is defined as

- 1). Junction of two or more elements
- 2). Closed loop
- 3). Independent current path
- 4). Circuit terminal

✓ Correct Answer: 1). Junction of two or more elements

Explanation:

A node is a point where **two or more circuit elements meet**.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

6. The number of independent mesh equations equals

- 1). Number of branches
- 2). Number of meshes
- 3). Number of nodes
- 4). Number of sources

✓ Correct Answer: 2). Number of meshes

Explanation:

Each mesh produces one KVL equation in mesh analysis.

Ref: Network Analysis – M.E. Van Valkenburg

7. Cramer's rule is used to

- 1). Solve simultaneous equations
- 2). Reduce circuit complexity
- 3). Find impedance
- 4). Find resonance frequency

✓ Correct Answer: 1). Solve simultaneous equations

Explanation:

Cramer's rule solves linear equations using **determinants**.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

8. Thevenin's theorem converts a network into

- 1). Current source and resistor
- 2). Voltage source and resistor
- 3). Only voltage source
- 4). Only resistor

✓ Correct Answer: 2). Voltage source and resistor

Explanation:

Thevenin equivalent consists of **V_{th} in series with R_{th}** .

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

9. Norton's theorem converts a network into

- 1). Voltage source with series resistance
- 2). Current source with parallel resistance
- 3). Only current source
- 4). Only resistance

✓ Correct Answer: 2). Current source with parallel resistance

Explanation:

Norton equivalent contains **I_N in parallel with R_N** .

Ref: Network Analysis – M.E. Van Valkenburg

10. Thevenin resistance is found by

- 1). Short circuiting all sources
- 2). Opening all sources
- 3). Deactivating independent sources
- 4). Removing load only

✓ Correct Answer: 3). Deactivating independent sources

Explanation:

Voltage sources are shorted and current sources opened while calculating R_{th} .

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

11. Superposition theorem is applicable only to

- 1). Linear circuits
- 2). Nonlinear circuits
- 3). Digital circuits
- 4). AC circuits only

✓ Correct Answer: 1). Linear circuits

Explanation:

Superposition works only when circuit obeys linear relationships.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

12. When applying superposition theorem, voltage sources are replaced by

- 1). Open circuit
- 2). Short circuit
- 3). Resistor
- 4). Current source

✓ Correct Answer: 2). Short circuit

Explanation:

Deactivating voltage source means replacing it with short circuit.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

13. Reciprocity theorem applies to

- 1). Linear bilateral networks
- 2). Nonlinear circuits
- 3). Digital circuits
- 4). Power systems only

✓ Correct Answer: 1). Linear bilateral networks

Explanation:

Reciprocity states that source and response positions can be interchanged.

Ref: Network Analysis – M.E. Van Valkenburg

14. Maximum power transfer occurs when

- 1). $R_L = 0$
- 2). $R_L = R_S$

- 3). $RL = 2RS$
- 4). $RL = RS/2$

✓ Correct Answer: 2). $RL = RS$

Explanation:

Maximum power transfer occurs when **load resistance equals source resistance**.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

15. Maximum efficiency under maximum power transfer condition is

- 1). 25%
- 2). 50%
- 3). 75%
- 4). 100%

✓ Correct Answer: 2). 50%

Explanation:

Half of the power is dissipated in source resistance and half in load.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

16. The transient response of RC circuit depends on

- 1). Resistance only
- 2). Capacitance only
- 3). Time constant
- 4). Frequency

✓ Correct Answer: 3). Time constant

Explanation:

Time constant $\tau = RC$ determines charging and discharging speed.

Ref: Circuits and Networks – A. Sudhakar and Shyammoan S. Palli

17. Time constant of RC circuit is

- 1). R/C
- 2). RC
- 3). $1/RC$
- 4). $\sqrt{RC}$

✓ Correct Answer: 2). RC

Explanation:

RC product determines time required for capacitor voltage change.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

18. Time constant of RL circuit is

- 1). R/L
- 2). L/R
- 3). RL
- 4). $\sqrt{LR}$

☒ Correct Answer: 2). L/R

Explanation:

RL time constant determines current rise and decay.

Ref: Circuits and Networks – A. Sudhakar and Shyammohan S. Palli

19. In RC charging circuit capacitor voltage reaches about 63% in

- 1). 0.5τ
- 2). τ
- 3). 2τ
- 4). 5τ

☒ Correct Answer: 2). τ

Explanation:

At one time constant capacitor reaches **63% of final value**.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

20. After how many time constants the capacitor is considered fully charged

- 1). 2τ
- 2). 3τ
- 3). 4τ
- 4). 5τ

☒ Correct Answer: 4). 5τ

Explanation:

After five time constants capacitor reaches about **99% of final voltage**.

Ref: Circuits and Networks – A. Sudhakar and Shyammohan S. Palli

21. Series resonance occurs in

- 1). RC circuit
- 2). RL circuit
- 3). RLC circuit
- 4). LC circuit only

✓ Correct Answer: 3). RLC circuit

Explanation:

Resonance occurs when inductive reactance equals capacitive reactance.

Ref: Network Analysis – M.E. Van Valkenburg

22. At resonance condition

- 1). $X_L = X_C$
- 2). $X_L > X_C$
- 3). $X_L < X_C$
- 4). $X_L = 0$

✓ Correct Answer: 1). $X_L = X_C$

Explanation:

Inductive and capacitive reactances cancel each other.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

23. Impedance at series resonance is

- 1). Maximum
- 2). Minimum
- 3). Zero
- 4). Infinite

✓ Correct Answer: 2). Minimum

Explanation:

At resonance impedance equals resistance only.

Ref: Network Analysis – M.E. Van Valkenburg

24. Current at series resonance is

- 1). Minimum
- 2). Maximum
- 3). Zero
- 4). Constant

✓ Correct Answer: 2). Maximum

Explanation:

Minimum impedance causes maximum current.

Ref: Circuits and Networks – A. Sudhakar and Shyammohan S. Palli

25. Resonant frequency of RLC circuit is

- 1). $1/RC$
- 2). $1/LC$
- 3). $1/(2\pi\sqrt{LC})$
- 4). $2\pi\sqrt{LC}$

✓ Correct Answer: 3). $1/(2\pi\sqrt{LC})$

Explanation:

Resonant frequency depends on inductance and capacitance.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

26. Quality factor of series resonant circuit is

- 1). XL/R
- 2). R/XL
- 3). $XL \times R$
- 4). $XL + R$

✓ Correct Answer: 1). XL/R

Explanation:

Q factor indicates sharpness of resonance.

Ref: Circuits and Networks – A. Sudhakar and Shyammohan S. Palli

27. Bandwidth of resonant circuit is

- 1). $f_2 + f_1$
- 2). $f_2 - f_1$
- 3). f_1 / f_2
- 4). $f_1 \times f_2$

✓ Correct Answer: 2). $f_2 - f_1$

Explanation:

Bandwidth is difference between upper and lower cutoff frequencies.

Ref: Network Analysis – M.E. Van Valkenburg

28. Selectivity of resonant circuit increases with

- 1). Low Q
- 2). High Q
- 3). Low frequency
- 4). High resistance

✓ Correct Answer: 2). High Q

Explanation:

Higher Q gives sharper resonance and better selectivity.

Ref: Circuits and Networks – A. Sudhakar and Shyammmohan S. Palli

29. Characteristic impedance of transmission line is

- 1). Load impedance
- 2). Input impedance
- 3). Ratio of voltage to current of traveling wave
- 4). Only resistance

✓ Correct Answer: 3). Ratio of voltage to current of traveling wave

Explanation:

Characteristic impedance defines impedance seen by traveling waves.

Ref: Networks, Lines and Fields – John D. Ryder

30. Reflection coefficient is defined as

- 1). Reflected voltage / incident voltage
- 2). Incident voltage / reflected voltage
- 3). Load voltage / source voltage
- 4). Current ratio

✓ Correct Answer: 1). Reflected voltage / incident voltage

Explanation:

Reflection coefficient measures amount of wave reflection.

Ref: Networks, Lines and Fields – John D. Ryder

31. If load impedance equals characteristic impedance

- 1). Reflection occurs
- 2). Maximum reflection occurs

- 3). No reflection occurs
- 4). Voltage doubles

☒ Correct Answer: 3). No reflection occurs

Explanation:

When $Z_L = Z_0$ the line is perfectly matched.

Ref: Networks, Lines and Fields – John D. Ryder

32. Standing Wave Ratio (SWR) is defined as

- 1). $V_{\max} / V_{\min}$
- 2). $V_{\min} / V_{\max}$
- 3). $I_{\max} / I_{\min}$
- 4). Power ratio

☒ Correct Answer: 1). $V_{\max} / V_{\min}$

Explanation:

SWR measures standing wave severity on transmission line.

Ref: Electromagnetic Waves and Radiating Systems – Edward C. Jordan and Keith G. Balmain

33. SWR for perfectly matched line is

- 1). 0
- 2). 1
- 3). 2
- 4). Infinite

☒ Correct Answer: 2). 1

Explanation:

No reflection means $V_{\max} = V_{\min}$.

Ref: Networks, Lines and Fields – John D. Ryder

34. RC low pass filter allows

- 1). High frequency signals
- 2). Low frequency signals
- 3). Both equally
- 4). No signals

☒ Correct Answer: 2). Low frequency signals

Explanation:

Capacitor blocks high frequency signals.

Ref: Pulse and Digital Circuits – A. Anand Kumar

35. RC high pass filter allows

- 1). Low frequency signals
- 2). High frequency signals
- 3). DC signals only
- 4). No signals

☒ Correct Answer: 2). High frequency signals

Explanation:

Capacitor passes high frequency signals.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

36. RC integrator behaves as

- 1). Low pass filter
- 2). High pass filter
- 3). Amplifier
- 4). Oscillator

☒ Correct Answer: 1). Low pass filter

Explanation:

Integrator allows low frequency components.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

37. RC differentiator behaves as

- 1). Low pass filter
- 2). High pass filter
- 3). Amplifier
- 4). Oscillator

☒ Correct Answer: 2). High pass filter

Explanation:

Differentiator passes rapid changes of signal.

Ref: Pulse and Digital Circuits – A. Anand Kumar

38. The cutoff frequency of RC circuit is

- 1). $1/(RC)$
- 2). $1/(2\pi RC)$
- 3). $2\pi RC$
- 4). RC

✓ Correct Answer: 2). $1/(2\pi RC)$

Explanation:

Cutoff frequency occurs when output drops to 70.7%.

Ref: Circuits and Networks – A. Sudhakar and Shyammohan S. Palli

39. If R increases in RC circuit, cutoff frequency

- 1). Increases
- 2). Decreases
- 3). Remains constant
- 4). Becomes zero

✓ Correct Answer: 2). Decreases

Explanation:

$f_c = 1/(2\pi RC)$, so increase in R reduces cutoff frequency.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

40. If C increases in RC circuit, cutoff frequency

- 1). Increases
- 2). Decreases
- 3). Remains constant
- 4). Doubles

✓ Correct Answer: 2). Decreases

Explanation:

Cutoff frequency inversely proportional to capacitance.

Ref: Circuits and Networks – A. Sudhakar and Shyammohan S. Palli

41. In mesh analysis, the sum of voltage drops around a closed loop is

- 1). Positive
- 2). Zero
- 3). Negative
- 4). Infinite

✓ Correct Answer: 2). Zero

Explanation:

According to KVL, the algebraic sum of voltages in any closed loop is zero.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

42. The number of node voltage equations required equals

- 1). Number of nodes minus one
- 2). Number of meshes
- 3). Number of branches
- 4). Number of sources

✓ Correct Answer: 1). Number of nodes minus one

Explanation:

One node is taken as reference, therefore equations = total nodes – 1.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

43. A reference node is also called

- 1). Terminal node
- 2). Ground node
- 3). Junction node
- 4). Branch node

✓ Correct Answer: 2). Ground node

Explanation:

Reference node is assigned zero voltage and is called ground node.

Ref: Network Analysis – M.E. Van Valkenburg

44. In Thevenin equivalent circuit the resistance is measured

- 1). Across source terminals
- 2). Across load terminals
- 3). Across ground
- 4). Across supply

✓ Correct Answer: 2). Across load terminals

Explanation:

Thevenin resistance is measured looking back from the load terminals.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

45. Norton current is equal to

- 1). Open circuit current
- 2). Short circuit current
- 3). Load current
- 4). Source current

☒ Correct Answer: 2). Short circuit current

Explanation:

Norton current equals the short circuit current between load terminals.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

46. Relation between Thevenin and Norton resistance is

- 1). $R_{th} = R_N$
- 2). $R_{th} = 1/R_N$
- 3). $R_{th} = R_N^2$
- 4). $R_{th} = 2R_N$

☒ Correct Answer: 1). $R_{th} = R_N$

Explanation:

Thevenin and Norton equivalent resistances are equal.

Ref: Network Analysis – M.E. Van Valkenburg

47. Thevenin voltage is measured under

- 1). Short circuit condition
- 2). Open circuit condition
- 3). Load condition
- 4). Resonance condition

☒ Correct Answer: 2). Open circuit condition

Explanation:

Thevenin voltage equals the open circuit voltage across load terminals.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

48. Superposition theorem cannot be used to calculate

- 1). Voltage
- 2). Current

- 3). Power
- 4). Resistance

✓ Correct Answer: 3). Power

Explanation:

Power depends on square of current/voltage, therefore superposition does not apply.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

49. In reciprocity theorem

- 1). Source and response positions can be interchanged
- 2). Current equals voltage
- 3). Power remains constant
- 4). Frequency doubles

✓ Correct Answer: 1). Source and response positions can be interchanged

Explanation:

Reciprocity theorem states that source and response positions are interchangeable.

Ref: Network Analysis – M.E. Van Valkenburg

50. Maximum power transfer theorem is applicable to

- 1). DC circuits only
- 2). AC circuits only
- 3). Both AC and DC circuits
- 4). Digital circuits

✓ Correct Answer: 3). Both AC and DC circuits

Explanation:

Maximum power transfer applies to both AC and DC circuits with proper impedance matching.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

51. Time constant of RC discharge circuit determines

- 1). Charging speed
- 2). Discharging speed
- 3). Voltage gain
- 4). Frequency response

✓ Correct Answer: 2). Discharging speed

Explanation:

RC time constant determines the rate at which capacitor voltage decreases.

Ref: Circuits and Networks – A. Sudhakar and Shyammohan S. Palli

52. In RL circuit current increases according to

- 1). Linear law
- 2). Exponential law
- 3). Quadratic law
- 4). Logarithmic law

☒ Correct Answer: 2). Exponential law

Explanation:

Inductor opposes sudden change in current causing exponential growth.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

53. Voltage across inductor during steady state DC is

- 1). Zero
- 2). Infinite
- 3). Equal to supply
- 4). Negative

☒ Correct Answer: 1). Zero

Explanation:

Inductor behaves like short circuit under steady DC conditions.

Ref: Circuits and Networks – A. Sudhakar and Shyammohan S. Palli

54. Voltage across capacitor during steady state DC is

- 1). Zero
- 2). Infinite
- 3). Constant
- 4). Alternating

☒ Correct Answer: 3). Constant

Explanation:

Capacitor behaves like open circuit in steady DC state.

Ref: Network Analysis – M.E. Van Valkenburg

55. In RLC series resonance circuit power factor is

- 1). Zero
- 2). Unity
- 3). Lagging
- 4). Leading

✓ Correct Answer: 2). Unity

Explanation:

At resonance inductive and capacitive reactances cancel resulting in unity power factor.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

56. The impedance of parallel resonance circuit is

- 1). Minimum
- 2). Maximum
- 3). Zero
- 4). Equal to resistance

✓ Correct Answer: 2). Maximum

Explanation:

Parallel resonance produces maximum impedance.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

57. Current in parallel resonance circuit is

- 1). Maximum
- 2). Minimum
- 3). Infinite
- 4). Constant

✓ Correct Answer: 2). Minimum

Explanation:

High impedance results in minimum supply current.

Ref: Circuits and Networks – A. Sudhakar and Shyammmohan S. Palli

58. Quality factor is defined as

- 1). Resonant frequency / bandwidth
- 2). Bandwidth / resonant frequency
- 3). Resistance / reactance
- 4). Reactance / resistance

✓ Correct Answer: 1). Resonant frequency / bandwidth

Explanation:

Q indicates sharpness of resonance.

Ref: Network Analysis – M.E. Van Valkenburg

59. Higher Q indicates

- 1). Low selectivity
- 2). High selectivity
- 3). High resistance
- 4). Low impedance

✓ Correct Answer: 2). High selectivity

Explanation:

High Q produces narrow bandwidth.

Ref: Circuits and Networks – A. Sudhakar and Shyammoan S. Palli

60. Bandwidth is inversely proportional to

- 1). Resistance
- 2). Inductance
- 3). Quality factor
- 4). Frequency

✓ Correct Answer: 3). Quality factor

Explanation:

$BW = f_r / Q$.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

61. Transmission line is used to

- 1). Store energy
- 2). Transfer power over distance
- 3). Amplify signals
- 4). Rectify voltage

✓ Correct Answer: 2). Transfer power over distance

Explanation:

Transmission lines carry electrical signals from source to load.

Ref: Networks, Lines and Fields – John D. Ryder

62. Characteristic impedance of lossless transmission line is

- 1). $\sqrt{R/G}$
- 2). $\sqrt{L/C}$
- 3). $\sqrt{R/C}$
- 4). $\sqrt{L/G}$

✓ Correct Answer: 2). $\sqrt{L/C}$

Explanation:

Characteristic impedance depends on inductance and capacitance.

Ref: Networks, Lines and Fields – John D. Ryder

63. Reflection coefficient is zero when

- 1). Load impedance equals characteristic impedance
- 2). Load impedance is infinite
- 3). Load impedance is zero
- 4). Frequency is zero

✓ Correct Answer: 1). Load impedance equals characteristic impedance

Explanation:

Perfect matching eliminates reflection.

Ref: Electromagnetic Waves and Radiating Systems – Edward C. Jordan and Keith G. Balmain

64. SWR becomes infinite when

- 1). Perfect match
- 2). Open or short circuit load
- 3). $RL = Z_0$
- 4). Frequency zero

✓ Correct Answer: 2). Open or short circuit load

Explanation:

Complete reflection causes infinite SWR.

Ref: Networks, Lines and Fields – John D. Ryder

65. If reflection coefficient is 0.5, SWR equals

- 1). 1
- 2). 2

- 3). 3
- 4). 4

✓ Correct Answer: 3). 3

Explanation:

$$\text{SWR} = (1+\Gamma)/(1-\Gamma) = (1+0.5)/(1-0.5) = 3.$$

Ref: Electromagnetic Waves and Radiating Systems – Edward C. Jordan and Keith G. Balmain

66. RC circuit acting as integrator requires

- 1). $RC \ll T$
- 2). $RC \gg T$
- 3). $RC = T$
- 4). $RC = 0$

✓ Correct Answer: 2). $RC \gg T$

Explanation:

Large time constant ensures integration effect.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

67. RC differentiator requires

- 1). $RC \ll T$
- 2). $RC \gg T$
- 3). $RC = T$
- 4). RC infinite

✓ Correct Answer: 1). $RC \ll T$

Explanation:

Small time constant produces differentiation effect.

Ref: Pulse and Digital Circuits – A. Anand Kumar

68. The output of differentiator for step input is

- 1). Ramp
- 2). Impulse
- 3). Square
- 4). Sine

✓ Correct Answer: 2). Impulse

Explanation:

Differentiator produces sharp spike when step input applied.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

69. The output of integrator for square wave input is

- 1). Triangular wave
- 2). Square wave
- 3). Sine wave
- 4). Pulse

✓ Correct Answer: 1). Triangular wave

Explanation:

Integration of square wave produces triangular waveform.

Ref: Pulse and Digital Circuits – A. Anand Kumar

70. Linear wave shaping circuits use

- 1). RC networks
- 2). LC networks
- 3). RL networks
- 4). All of the above

✓ Correct Answer: 1). RC networks

Explanation:

RC circuits shape signals into integrator or differentiator outputs.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

71. The number of meshes in a planar circuit is

- 1). Branches – Nodes + 1
- 2). Branches + Nodes
- 3). Nodes – Branches
- 4). Branches / Nodes

✓ Correct Answer: 1). Branches – Nodes + 1

Explanation:

For planar networks, number of independent meshes equals $B - N + 1$.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly and Steven M. Durbin

72. A branch in an electrical circuit is

- 1). A closed loop
- 2). A single element or path between two nodes
- 3). A combination of meshes
- 4). A reference node

☒ Correct Answer: 2). A single element or path between two nodes

Explanation:

A branch represents one circuit element such as resistor, capacitor, or source.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

73. If a network has 6 branches and 4 nodes, the number of meshes is

- 1). 2
- 2). 3
- 3). 4
- 4). 6

☒ Correct Answer: 2). 3

Explanation:

$\text{Meshes} = B - N + 1 = 6 - 4 + 1 = 3.$

Ref: Network Analysis – M.E. Van Valkenburg

74. In node analysis the voltage at reference node is

- 1). 1 V
- 2). 10 V
- 3). 0 V
- 4). Infinite

☒ Correct Answer: 3). 0 V

Explanation:

Reference node is assigned zero potential.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly and Steven M. Durbin

75. If $R_{th} = 10\ \Omega$ and $V_{th} = 20\text{ V}$, the short circuit current is

- 1). 1 A
- 2). 2 A
- 3). 10 A
- 4). 20 A

✓ Correct Answer: 2). 2 A

Explanation:

$$I_{sc} = V_{th} / R_{th} = 20 / 10 = 2 \text{ A.}$$

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

76. If $R_{th} = 5 \Omega$ and load resistance is 5Ω , the power transfer is

- 1). Maximum
- 2). Minimum
- 3). Zero
- 4). Constant

✓ Correct Answer: 1). Maximum

Explanation:

Maximum power transfer occurs when $R_L = R_{th}$.

Ref: Network Analysis – M.E. Van Valkenburg

77. Maximum power delivered to load when $V_{th} = 10 \text{ V}$ and $R_{th} = 5 \Omega$ is

- 1). 2.5 W
- 2). 5 W
- 3). 10 W
- 4). 20 W

✓ Correct Answer: 2). 5 W

Explanation:

$$P_{max} = V^2 / (4R_{th}) = 100 / 20 = 5 \text{ W.}$$

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly and Steven M. Durbin

78. If time constant $\tau = 2$ seconds, capacitor voltage reaches 63% in

- 1). 1 sec
- 2). 2 sec
- 3). 3 sec
- 4). 4 sec

✓ Correct Answer: 2). 2 sec

Explanation:

Voltage reaches 63% of final value at one time constant.

Ref: Circuits and Networks: Analysis and Synthesis – A. Sudhakar and Shyammmohan S. Palli

79. In an RC circuit with $R = 2 \text{ k}\Omega$ and $C = 10 \text{ }\mu\text{F}$, the time constant is

- 1). 0.02 s
- 2). 0.2 s
- 3). 2 s
- 4). 20 s

☒ Correct Answer: 1). 0.02 s

Explanation:

$$\tau = RC = 2000 \times 10 \times 10^{-6} = 0.02 \text{ s.}$$

Ref: Network Analysis and Synthesis – Franklin F. Kuo

80. If $L = 2 \text{ H}$ and $R = 4 \text{ }\Omega$ in RL circuit, time constant is

- 1). 0.25 s
- 2). 0.5 s
- 3). 1 s
- 4). 2 s

☒ Correct Answer: 2). 0.5 s

Explanation:

$$\tau = L/R = 2/4 = 0.5 \text{ s.}$$

Ref: Circuits and Networks: Analysis and Synthesis – A. Sudhakar and Shyammmohan S. Palli

81. At series resonance the impedance is

- 1). Purely inductive
- 2). Purely capacitive
- 3). Purely resistive
- 4). Infinite

☒ Correct Answer: 3). Purely resistive

Explanation:

Inductive and capacitive reactances cancel each other.

Ref: Network Analysis – M.E. Van Valkenburg

82. In series resonance voltage across inductor is

- 1). Zero
- 2). Minimum

- 3). Maximum
- 4). Equal to supply

✓ Correct Answer: 3). Maximum

Explanation:

Large circulating current produces high voltage across L and C.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly and Steven M. Durbin

83. If resonant frequency is 1 kHz and bandwidth is 100 Hz, Q factor is

- 1). 5
- 2). 10
- 3). 20
- 4). 100

✓ Correct Answer: 2). 10

Explanation:

$$Q = f_r / BW = 1000 / 100 = 10.$$

Ref: Circuits and Networks: Analysis and Synthesis – A. Sudhakar and Shyammmohan S. Palli

84. If Q factor increases, bandwidth

- 1). Increases
- 2). Decreases
- 3). Remains constant
- 4). Becomes infinite

✓ Correct Answer: 2). Decreases

Explanation:

$$BW = f_r / Q.$$

Ref: Network Analysis and Synthesis – Franklin F. Kuo

85. At parallel resonance current drawn from supply is

- 1). Maximum
- 2). Minimum
- 3). Infinite
- 4). Zero

✓ Correct Answer: 2). Minimum

Explanation:

Parallel resonance produces maximum impedance.

Ref: Network Analysis – M.E. Van Valkenburg

86. If inductive reactance equals capacitive reactance, the circuit is

- 1). Balanced
- 2). Resonant
- 3). Short circuited
- 4). Open circuited

☒ Correct Answer: 2). Resonant

Explanation:

Resonance occurs when $X_L = X_C$.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly and Steven M. Durbin

87. If reflection coefficient $\Gamma = 0$, SWR is

- 1). 0
- 2). 1
- 3). 2
- 4). Infinite

☒ Correct Answer: 2). 1

Explanation:

No reflection gives $SWR = 1$.

Ref: Networks, Lines and Fields – John D. Ryder

88. If reflection coefficient $\Gamma = 1$, SWR becomes

- 1). 1
- 2). 2
- 3). 3
- 4). Infinite

☒ Correct Answer: 4). Infinite

Explanation:

Complete reflection causes infinite standing wave ratio.

Ref: Electromagnetic Waves and Radiating Systems – Edward C. Jordan and Keith G. Balmain

89. The unit of characteristic impedance is

- 1). Volt
- 2). Ohm
- 3). Ampere
- 4). Henry

✓ Correct Answer: 2). Ohm

Explanation:

Characteristic impedance is ratio of voltage to current.

Ref: Networks, Lines and Fields – John D. Ryder

90. If $Z_L = 100 \Omega$ and $Z_0 = 50 \Omega$, reflection coefficient magnitude is

- 1). 0.33
- 2). 0.5
- 3). 0.67
- 4). 1

✓ Correct Answer: 1). 0.33

Explanation:

$$\Gamma = (Z_L - Z_0)/(Z_L + Z_0) = (100 - 50)/(100 + 50) = 0.33.$$

Ref: Electromagnetic Waves and Radiating Systems – Edward C. Jordan and Keith G. Balmain

91. SWR when reflection coefficient is 0.33 is approximately

- 1). 1
- 2). 1.5
- 3). 2
- 4). 3

✓ Correct Answer: 3). 2

Explanation:

$$\text{SWR} = (1 + \Gamma)/(1 - \Gamma).$$

Ref: Networks, Lines and Fields – John D. Ryder

92. In RC low pass filter cutoff frequency occurs when gain becomes

- 1). 0.5
- 2). 0.707
- 3). 1
- 4). 2

✓ Correct Answer: 2). 0.707

Explanation:

Cutoff occurs when output is 70.7% of input.

Ref: Pulse and Digital Circuits – A. Anand Kumar

93. The output of RC integrator for step input is

- 1). Ramp waveform
- 2). Square waveform
- 3). Sine waveform
- 4). Pulse waveform

✓ Correct Answer: 1). Ramp waveform

Explanation:

Integration of step input produces ramp output.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

94. The output of RC differentiator for ramp input is

- 1). Square wave
- 2). Constant voltage
- 3). Pulse
- 4). Sine wave

✓ Correct Answer: 2). Constant voltage

Explanation:

Differentiation of ramp gives constant value.

Ref: Pulse and Digital Circuits – A. Anand Kumar

95. If $RC \gg$ signal period, circuit behaves as

- 1). Differentiator
- 2). Integrator
- 3). Amplifier
- 4). Oscillator

✓ Correct Answer: 2). Integrator

Explanation:

Large time constant causes integration.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

96. If $RC \ll$ signal period, circuit behaves as

- 1). Integrator
- 2). Differentiator
- 3). Filter
- 4). Rectifier

☒ Correct Answer: 2). Differentiator

Explanation:

Small time constant produces differentiation.

Ref: Pulse and Digital Circuits – A. Anand Kumar

97. In RC circuit voltage across capacitor cannot change

- 1). Slowly
- 2). Exponentially
- 3). Instantaneously
- 4). Gradually

☒ Correct Answer: 3). Instantaneously

Explanation:

Capacitor voltage changes gradually due to energy storage.

Ref: Circuits and Networks: Analysis and Synthesis – A. Sudhakar and Shyammmohan S. Palli

98. Current through inductor cannot change

- 1). Gradually
- 2). Instantaneously
- 3). Slowly
- 4). Exponentially

☒ Correct Answer: 2). Instantaneously

Explanation:

Inductor opposes sudden change in current.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

99. When capacitor discharges, voltage follows

- 1). Linear decay
- 2). Exponential decay

- 3). Constant value
- 4). Sinusoidal decay

☒ Correct Answer: 2). Exponential decay

Explanation:

Discharging capacitor voltage follows exponential decay.

Ref: Circuits and Networks: Analysis and Synthesis – A. Sudhakar and Shyammmohan S. Palli

100. After 5 time constants capacitor voltage becomes approximately

- 1). 63%
- 2). 86%
- 3). 95%
- 4). 99%

☒ Correct Answer: 4). 99%

Explanation:

After five time constants capacitor nearly reaches final voltage.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

101. In transmission line the standing wave is formed due to

- 1). Attenuation
- 2). Reflection
- 3). Amplification
- 4). Oscillation

☒ Correct Answer: 2). Reflection

Explanation:

Standing waves form when incident and reflected waves combine.

Ref: Networks, Lines and Fields – John D. Ryder

102. Voltage maximum occurs when

- 1). Waves cancel
- 2). Waves reinforce
- 3). Current minimum occurs
- 4). Frequency doubles

☒ Correct Answer: 2). Waves reinforce

Explanation:

Constructive interference produces voltage maxima.

Ref: Electromagnetic Waves and Radiating Systems – Edward C. Jordan and Keith G. Balmain

103. Voltage minimum occurs when

- 1). Waves reinforce
- 2). Waves cancel
- 3). Power doubles
- 4). Frequency decreases

☒ Correct Answer: 2). Waves cancel

Explanation:

Destructive interference produces voltage minima.

Ref: Networks, Lines and Fields – John D. Ryder

104. If SWR = 1 the line is

- 1). Shorted
- 2). Open
- 3). Matched
- 4). Lossy

☒ Correct Answer: 3). Matched

Explanation:

Perfect matching gives no reflections.

Ref: Electromagnetic Waves and Radiating Systems – Edward C. Jordan and Keith G. Balmain

105. Characteristic impedance depends on

- 1). Load resistance
- 2). Line parameters
- 3). Supply voltage
- 4). Frequency only

☒ Correct Answer: 2). Line parameters

Explanation:

Z_0 depends on inductance and capacitance per unit length.

Ref: Networks, Lines and Fields – John D. Ryder

106. For lossless line Z_0 equals

- 1). $\sqrt{R/G}$
- 2). $\sqrt{L/C}$
- 3). $\sqrt{RC}$
- 4). $\sqrt{LG}$

✓ Correct Answer: 2). $\sqrt{L/C}$

Explanation:

Characteristic impedance determined by inductance and capacitance.

Ref: Networks, Lines and Fields – John D. Ryder

107. In resonance circuit voltage magnification equals

- 1). Q
- 2). $1/Q$
- 3). $\sqrt{Q}$
- 4). Q^2

✓ Correct Answer: 1). Q

Explanation:

Voltage magnification factor equals quality factor.

Ref: Network Analysis – M.E. Van Valkenburg

108. Current magnification occurs in

- 1). Series resonance
- 2). Parallel resonance
- 3). RC circuit
- 4). RL circuit

✓ Correct Answer: 2). Parallel resonance

Explanation:

Large circulating currents occur in parallel resonance.

Ref: Circuits and Networks: Analysis and Synthesis – A. Sudhakar and Shyammmohan S. Palli

109. The resonant frequency increases when

- 1). L increases
- 2). C increases
- 3). L decreases
- 4). Both L and C increase

✓ Correct Answer: 3). L decreases

Explanation:

$$f_r = 1/(2\pi\sqrt{LC}).$$

Ref: Network Analysis and Synthesis – Franklin F. Kuo

110. Selectivity of circuit improves when

- 1). Bandwidth increases
- 2). Q decreases
- 3). Q increases
- 4). Frequency decreases

✓ Correct Answer: 3). Q increases

Explanation:

Higher Q gives sharper resonance curve.

Ref: Network Analysis – M.E. Van Valkenburg

111. The resonant frequency of an RLC circuit becomes higher when

- 1). Inductance increases
- 2). Capacitance increases
- 3). Inductance decreases
- 4). Both L and C increase

✓ Correct Answer: 3). Inductance decreases

Explanation:

$$\text{Resonant frequency } f_r = \frac{1}{2\pi\sqrt{LC}}.$$

Reducing inductance decreases LC , thus increasing resonant frequency.

Ref: Circuits and Networks: Analysis and Synthesis – A. Sudhakar and Shyammmohan S. Palli

112. If the bandwidth of a resonant circuit increases, the Q factor

- 1). Increases
- 2). Decreases
- 3). Remains constant
- 4). Becomes zero

✓ Correct Answer: 2). Decreases

Explanation:

Quality factor $Q = \frac{f_r}{BW}$.

If bandwidth increases while resonant frequency remains same, Q decreases.

Ref: Network Analysis – M.E. Van Valkenburg

113. In a series resonant circuit, voltage across capacitor is

- 1). Minimum
- 2). Equal to supply
- 3). Maximum
- 4). Zero

☒ Correct Answer: 3). Maximum

Explanation:

At resonance current is maximum, producing large voltage across reactive components.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly and Steven M. Durbin

114. The current in a series RLC circuit at resonance is

- 1). Minimum
- 2). Maximum
- 3). Zero
- 4). Infinite

☒ Correct Answer: 2). Maximum

Explanation:

At resonance impedance becomes minimum (equal to R), resulting in maximum current.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

115. In parallel resonance circuit, impedance is

- 1). Minimum
- 2). Maximum
- 3). Zero
- 4). Equal to reactance

☒ Correct Answer: 2). Maximum

Explanation:

Parallel resonance produces very high impedance.

Ref: Network Analysis – M.E. Van Valkenburg

116. The half-power frequencies are also called

- 1). Resonant frequencies
- 2). Cutoff frequencies
- 3). Natural frequencies
- 4). Peak frequencies

✓ Correct Answer: 2). Cutoff frequencies

Explanation:

At these frequencies power drops to half of maximum value.

Ref: Circuits and Networks: Analysis and Synthesis – A. Sudhakar and Shyammmohan S. Palli

117. The bandwidth of a circuit having $f_1 = 900 \text{ Hz}$ and $f_2 = 1100 \text{ Hz}$ is

- 1). 100 Hz
- 2). 150 Hz
- 3). 200 Hz
- 4). 300 Hz

✓ Correct Answer: 3). 200 Hz

Explanation:

Bandwidth $BW = f_2 - f_1 = 1100 - 900 = 200 \text{ Hz}$.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

118. The Q factor of a circuit with $f_r = 1000 \text{ Hz}$ and $BW = 200 \text{ Hz}$ is

- 1). 2
- 2). 5
- 3). 10
- 4). 20

✓ Correct Answer: 2). 5

Explanation:

$$Q = \frac{f_r}{BW} = \frac{1000}{200} = 5.$$

Ref: Network Analysis – M.E. Van Valkenburg

119. If load impedance equals characteristic impedance, the reflection coefficient is

- 1). -1
- 2). 0

- 3). 1
- 4). Infinite

✓ Correct Answer: 2). 0

Explanation:

Perfect matching causes no reflection.

Ref: Networks, Lines and Fields – John D. Ryder

120. Standing wave ratio depends on

- 1). Voltage only
- 2). Current only
- 3). Reflection coefficient
- 4). Frequency

✓ Correct Answer: 3). Reflection coefficient

Explanation:

$$SWR = \frac{1+|\Gamma|}{1-|\Gamma|}$$

Ref: Electromagnetic Waves and Radiating Systems – Edward C. Jordan and Keith G. Balmain

121. If reflection coefficient magnitude is 0.25, SWR is

- 1). 1.25
- 2). 1.67
- 3). 2
- 4). 3

✓ Correct Answer: 2). 1.67

Explanation:

$$SWR = \frac{1+0.25}{1-0.25} = 1.67.$$

Ref: Networks, Lines and Fields – John D. Ryder

122. In transmission lines voltage maxima occur where

- 1). Incident and reflected waves cancel
- 2). Waves reinforce each other
- 3). Current becomes zero
- 4). Load impedance infinite

✓ Correct Answer: 2). Waves reinforce each other

Explanation:

Constructive interference produces maximum voltage points.

Ref: Electromagnetic Waves and Radiating Systems – Edward C. Jordan and Keith G. Balmain

123. Voltage minima occur when

- 1). Waves reinforce
- 2). Waves cancel
- 3). Current increases
- 4). Resistance decreases

☒ Correct Answer: 2). Waves cancel

Explanation:

Destructive interference produces voltage minimum.

Ref: Networks, Lines and Fields – John D. Ryder

124. In RC differentiator the output is taken across

- 1). Capacitor
- 2). Resistor
- 3). Inductor
- 4). Source

☒ Correct Answer: 2). Resistor

Explanation:

Differentiator output appears across resistor.

Ref: Pulse and Digital Circuits – A. Anand Kumar

125. In RC integrator output is taken across

- 1). Capacitor
- 2). Resistor
- 3). Inductor
- 4). Source

☒ Correct Answer: 1). Capacitor

Explanation:

Integrator output voltage is across capacitor.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

126. The RC low pass filter attenuates

- 1). Low frequencies
- 2). High frequencies
- 3). DC only
- 4). All frequencies

✓ Correct Answer: 2). High frequencies

Explanation:

Capacitor reactance decreases with frequency reducing output.

Ref: Pulse and Digital Circuits – A. Anand Kumar

127. RC high pass filter attenuates

- 1). High frequencies
- 2). Low frequencies
- 3). All frequencies
- 4). DC signals only

✓ Correct Answer: 2). Low frequencies

Explanation:

Capacitor blocks low frequency components.

Ref: Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub

128. If R increases in RC circuit, time constant

- 1). Decreases
- 2). Increases
- 3). Remains constant
- 4). Becomes zero

✓ Correct Answer: 2). Increases

Explanation:

Time constant $\tau = RC$.

Ref: Circuits and Networks: Analysis and Synthesis – A. Sudhakar and Shyammmohan S. Palli

129. If capacitance doubles, RC time constant

- 1). Halves
- 2). Doubles
- 3). Remains constant
- 4). Becomes zero

✓ Correct Answer: 2). Doubles

Explanation:

Time constant directly proportional to capacitance.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

130. If inductance doubles in RL circuit, time constant

- 1). Doubles
- 2). Halves
- 3). Remains same
- 4). Becomes zero

✓ Correct Answer: 1). Doubles

Explanation:

$$\tau = L/R.$$

Ref: Circuits and Networks: Analysis and Synthesis – A. Sudhakar and Shyammmohan S. Palli

131. In RL circuit current after one time constant reaches

- 1). 37%
- 2). 50%
- 3). 63%
- 4). 100%

✓ Correct Answer: 3). 63%

Explanation:

Current reaches 63% of final value at one time constant.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

132. Current in RL circuit after long time becomes

- 1). Zero
- 2). Maximum constant value
- 3). Infinite
- 4). Alternating

✓ Correct Answer: 2). Maximum constant value

Explanation:

Inductor behaves like short circuit in steady DC.

Ref: Network Analysis – M.E. Van Valkenburg

133. Capacitor behaves as open circuit in

- 1). Transient state
- 2). Steady state DC
- 3). AC circuits
- 4). High frequency circuits

✓ Correct Answer: 2). Steady state DC

Explanation:

No current flows through capacitor under steady DC.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

134. Inductor behaves as short circuit in

- 1). AC circuits
- 2). Transient condition
- 3). Steady state DC
- 4). High frequency

✓ Correct Answer: 3). Steady state DC

Explanation:

Inductor voltage becomes zero when current is constant.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly and Steven M. Durbin

135. In resonance circuits the energy alternates between

- 1). Resistance and capacitor
- 2). Inductor and capacitor
- 3). Source and resistor
- 4). Capacitor and source

✓ Correct Answer: 2). Inductor and capacitor

Explanation:

Energy oscillates between magnetic field of inductor and electric field of capacitor.

Ref: Network Analysis – M.E. Van Valkenburg

136. The sharpness of resonance depends on

- 1). Resistance
- 2). Frequency

- 3). Q factor
- 4). Inductance

✓ Correct Answer: 3). Q factor

Explanation:

Higher Q produces sharper resonance curve.

Ref: Circuits and Networks: Analysis and Synthesis – A. Sudhakar and Shyammmohan S. Palli

137. If bandwidth decreases, selectivity

- 1). Decreases
- 2). Increases
- 3). Remains constant
- 4). Becomes zero

✓ Correct Answer: 2). Increases

Explanation:

Narrow bandwidth improves selectivity.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

138. In a matched transmission line

- 1). Power loss maximum
- 2). Reflection maximum
- 3). Power transfer maximum
- 4). Voltage zero

✓ Correct Answer: 3). Power transfer maximum

Explanation:

Matching eliminates reflections ensuring efficient power transfer.

Ref: Networks, Lines and Fields – John D. Ryder

139. Standing waves occur when

- 1). Load impedance equals line impedance
- 2). Reflection occurs
- 3). Voltage zero
- 4). Power zero

✓ Correct Answer: 2). Reflection occurs

Explanation:

Reflected waves combine with incident waves producing standing waves.

Ref: Electromagnetic Waves and Radiating Systems – Edward C. Jordan and Keith G. Balmain

140. In transmission line SWR is always

- 1). Less than 1
- 2). Equal to 0
- 3). Greater than or equal to 1
- 4). Infinite

☒ Correct Answer: 3). Greater than or equal to 1

Explanation:

SWR ranges from **1 (perfect match) to infinity (complete reflection)**.

Ref: Networks, Lines and Fields – John D. Ryder

UNIT 3. ELECTRONIC MEASURING INSTRUMENTS AND AUDIO & VIDEO SYSTEMS

1. The instrument used to measure electric current is

- 1). Voltmeter
- 2). Ammeter
- 3). Ohmmeter
- 4). Wattmeter

☒ Correct Answer: 2). Ammeter

Explanation:

An ammeter is designed to measure electric current and is connected **in series** with the circuit.

Ref: A Course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney

2. The internal resistance of an ideal ammeter is

- 1). Infinite
- 2). Zero
- 3). Very high
- 4). Moderate

☒ Correct Answer: 2). Zero

Explanation:

An ideal ammeter should have zero resistance to avoid affecting circuit current.

Ref: Electronic Instrumentation – H.S. Kalsi

3. The internal resistance of an ideal voltmeter is

- 1). Zero
- 2). Very low
- 3). Infinite
- 4). Moderate

☒ Correct Answer: 3). Infinite

Explanation:

Infinite resistance prevents current flow through the voltmeter.

Ref: Electronic Instrumentation and Measurement Techniques – William D. Cooper and Albert D. Helfrick

4. The range of an ammeter can be extended using

- 1). Series resistance
- 2). Shunt resistance
- 3). Capacitor
- 4). Inductor

☒ Correct Answer: 2). Shunt resistance

Explanation:

A low resistance shunt is connected in parallel with the meter to bypass excess current.

Ref: A Course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney

5. The range of a voltmeter can be extended using

- 1). Shunt resistance
- 2). Series resistance
- 3). Capacitor
- 4). Transformer

☒ Correct Answer: 2). Series resistance

Explanation:

A high series resistance limits current through the voltmeter.

Ref: Electronic Instrumentation – H.S. Kalsi

6. Ohmmeter measures

- 1). Current
- 2). Voltage
- 3). Resistance
- 4). Power

☒ Correct Answer: 3). Resistance

Explanation:

Ohmmeter determines resistance by applying internal voltage source.

Ref: Electronic Instrumentation – H.S. Kalsi

7. The instrument using field effect transistor at input stage is

- 1). Digital voltmeter
- 2). FET voltmeter
- 3). Analog voltmeter
- 4). Ohmmeter

☒ Correct Answer: 2). FET voltmeter

Explanation:

FET voltmeters provide **very high input impedance**.

Ref: Electronic Instrumentation – H.S. Kalsi

8. The main advantage of FET voltmeter is

- 1). Low impedance
- 2). High input impedance
- 3). High power consumption
- 4). Low accuracy

☒ Correct Answer: 2). High input impedance

Explanation:

FET input reduces loading effect on measured circuit.

Ref: Electronic Instrumentation and Measurement Techniques – William D. Cooper and Albert D. Helfrick

9. Differential voltmeter measures

- 1). Absolute voltage
- 2). Difference between two voltages
- 3). Average voltage
- 4). Maximum voltage

☒ Correct Answer: 2). Difference between two voltages

Explanation:

Differential voltmeter compares unknown voltage with reference voltage.

Ref: Electronic Instrumentation – H.S. Kalsi

10. Digital instruments display output in

- 1). Analog form
- 2). Digital numeric form
- 3). Graphical form
- 4). Sinusoidal form

✓ Correct Answer: 2). Digital numeric form

Explanation:

Digital instruments display readings using numeric digits.

Ref: Modern Electronic Instrumentation and Measurement Techniques – Helfrick & Cooper

11. Ramp type digital voltmeter works on

- 1). Voltage comparison
- 2). Time measurement
- 3). Current measurement
- 4). Frequency measurement

✓ Correct Answer: 2). Time measurement

Explanation:

Ramp voltage converts amplitude into time interval.

Ref: Electronic Instrumentation – H.S. Kalsi

12. Dual slope integration method is used in

- 1). Digital voltmeter
- 2). Analog voltmeter
- 3). CRO
- 4). Oscillator

✓ Correct Answer: 1). Digital voltmeter

Explanation:

Dual slope ADC improves noise rejection and accuracy.

Ref: Modern Electronic Instrumentation and Measurement Techniques – Helfrick & Cooper

13. The main advantage of dual slope ADC is

- 1). Low accuracy
- 2). High noise immunity
- 3). Slow operation
- 4). High distortion

☒ Correct Answer: 2). High noise immunity

Explanation:

Integration averages noise improving measurement accuracy.

Ref: Electronic Instrumentation – H.S. Kalsi

14. Successive approximation ADC converts

- 1). Digital to analog
- 2). Analog to digital
- 3). Frequency to voltage
- 4). Voltage to current

☒ Correct Answer: 2). Analog to digital

Explanation:

It uses comparator and DAC to determine digital output.

Ref: Digital Instrumentation – A.J. Bouwens

15. Successive approximation ADC requires

- 1). Comparator
- 2). DAC
- 3). Control logic
- 4). All of the above

☒ Correct Answer: 4). All of the above

Explanation:

These blocks are essential for binary search conversion.

Ref: Digital Instrumentation – A.J. Bouwens

16. Digital frequency meter measures

- 1). Voltage
- 2). Current
- 3). Frequency
- 4). Power

✓ Correct Answer: 3). Frequency

Explanation:

It counts number of cycles within a time interval.

Ref: Electronic Instrumentation – H.S. Kalsi

17. Digital LCR meter measures

- 1). Voltage
- 2). Current
- 3). Inductance, capacitance, resistance
- 4). Frequency only

✓ Correct Answer: 3). Inductance, capacitance, resistance

Explanation:

LCR meter measures passive component parameters.

Ref: Electronic Instrumentation – H.S. Kalsi

18. CRO stands for

- 1). Cathode Ray Oscillator
- 2). Cathode Ray Oscilloscope
- 3). Current Response Oscillator
- 4). Cathode Resistance Oscillator

✓ Correct Answer: 2). Cathode Ray Oscilloscope

Explanation:

CRO displays voltage signals graphically versus time.

Ref: Electronic Devices and Circuits – David A. Bell

19. The main component of CRO is

- 1). CRT
- 2). Transistor
- 3). Oscillator
- 4). Transformer

✓ Correct Answer: 1). CRT

Explanation:

Cathode Ray Tube produces visible waveform.

Ref: Electronic Devices and Circuits – David A. Bell

20. CRT stands for

- 1). Cathode Ray Tube
- 2). Current Ray Tube
- 3). Cathode Resistance Tube
- 4). Cathode Resonance Tube

✓ Correct Answer: 1). Cathode Ray Tube

Explanation:

CRT generates electron beam for display.

Ref: Electronic Devices and Circuits – David A. Bell

21. In CRT electron beam originates from

- 1). Anode
- 2). Cathode
- 3). Grid
- 4). Screen

✓ Correct Answer: 2). Cathode

Explanation:

Cathode emits electrons through thermionic emission.

Ref: Electronic Devices and Circuits – David A. Bell

22. The screen of CRT is coated with

- 1). Copper
- 2). Zinc sulfide
- 3). Silicon
- 4). Carbon

☒ Correct Answer: 2). Zinc sulfide

Explanation:

Phosphor coating emits light when struck by electrons.

Ref: Electronic Devices and Circuits – David A. Bell

23. Horizontal deflection plates produce

- 1). Vertical movement
- 2). Horizontal movement
- 3). Circular movement
- 4). Random movement

☒ Correct Answer: 2). Horizontal movement

Explanation:

Horizontal plates control beam movement along X-axis.

Ref: Electronic Devices and Circuits – David A. Bell

24. Vertical deflection plates produce

- 1). Vertical movement
- 2). Horizontal movement
- 3). Diagonal movement
- 4). Circular movement

☒ Correct Answer: 1). Vertical movement

Explanation:

Vertical plates move beam along Y-axis.

Ref: Electronic Devices and Circuits – David A. Bell

25. Time base generator in CRO produces

- 1). Square wave
- 2). Ramp waveform
- 3). Sine wave
- 4). Pulse waveform

☒ Correct Answer: 2). Ramp waveform

Explanation:

Ramp voltage moves electron beam uniformly across screen.

Ref: Pulse and Digital Circuits – A. Anand Kumar

26. Deflection sensitivity of CRO is defined as

- 1). Voltage per unit deflection
- 2). Deflection per unit voltage
- 3). Current per voltage
- 4). Frequency per voltage

☒ Correct Answer: 2). Deflection per unit voltage

Explanation:

Indicates beam displacement for given voltage.

Ref: Electronic Devices and Circuits – David A. Bell

27. Triggered sweep circuit is used to

- 1). Stabilize waveform display
- 2). Increase brightness
- 3). Increase frequency
- 4). Increase gain

☒ Correct Answer: 1). Stabilize waveform display

Explanation:

Triggering synchronizes sweep with input signal.

Ref: Pulse and Digital Circuits – A. Anand Kumar

28. CRO is used to measure

- 1). Voltage
- 2). Frequency
- 3). Phase difference
- 4). All of the above

☒ Correct Answer: 4). All of the above

Explanation:

CRO measures various signal parameters.

Ref: Electronic Devices and Circuits – David A. Bell

29. AF oscillator generates

- 1). Audio frequency signals
- 2). Radio frequency signals
- 3). Microwave signals
- 4). DC signals

☒ Correct Answer: 1). Audio frequency signals

Explanation:

AF oscillators generate signals in audio range.

Ref: Audio and Video Systems – R.G. Gupta

30. RF signal generator produces

- 1). Audio signals
- 2). Radio frequency signals
- 3). DC voltage
- 4). Pulse signals

☒ Correct Answer: 2). Radio frequency signals

Explanation:

RF generators produce high frequency signals.

Ref: Electronic Instrumentation – H.S. Kalsi

31. Digital IC tester checks

- 1). Analog ICs
- 2). Digital ICs
- 3). Passive components
- 4). Transistors

✓ Correct Answer: 2). Digital ICs

Explanation:

Digital IC tester verifies logic IC functionality.

Ref: Electronic Instrumentation – H.S. Kalsi

32. Audio systems mainly process

- 1). Sound signals
- 2). Video signals
- 3). RF signals
- 4). Microwave signals

✓ Correct Answer: 1). Sound signals

Explanation:

Audio systems amplify and reproduce sound signals.

Ref: Audio and Video Systems – R.G. Gupta

33. The device converting sound waves into electrical signals is

- 1). Loudspeaker
- 2). Microphone
- 3). Amplifier
- 4). Oscillator

✓ Correct Answer: 2). Microphone

Explanation:

Microphones convert acoustic energy into electrical signals.

Ref: Audio and Video Systems – R.G. Gupta

34. Loudspeaker converts

- 1). Electrical signals to sound
- 2). Sound to electrical signals
- 3). Frequency to voltage
- 4). Voltage to current

✓ Correct Answer: 1). Electrical signals to sound

Explanation:

Speaker converts electrical energy into acoustic energy.

Ref: Audio and Video Systems – R.G. Gupta

35. Amplifier in audio system is used to

- 1). Increase signal power
- 2). Reduce noise
- 3). Generate frequency
- 4). Convert digital signals

✓ Correct Answer: 1). Increase signal power

Explanation:

Amplifiers boost weak audio signals.

Ref: Audio and Video Systems – R.G. Gupta

36. In CRO brightness is controlled by

- 1). Grid voltage
- 2). Cathode voltage
- 3). Plate voltage
- 4). Anode current

✓ Correct Answer: 1). Grid voltage

Explanation:

Grid controls intensity of electron beam.

Ref: Electronic Devices and Circuits – David A. Bell

37. Focus control in CRT is achieved by

- 1). Grid
- 2). Focusing anode
- 3). Cathode
- 4). Heater

✓ Correct Answer: 2). Focusing anode

Explanation:

Focusing anode adjusts beam sharpness.

Ref: Electronic Devices and Circuits – David A. Bell

38. CRO display represents

- 1). Voltage vs time
- 2). Current vs voltage
- 3). Power vs frequency
- 4). Voltage vs resistance

✓ Correct Answer: 1). Voltage vs time

Explanation:

CRO graphically displays waveform over time.

Ref: Electronic Devices and Circuits – David A. Bell

39. The vertical amplifier in CRO amplifies

- 1). Horizontal signal
- 2). Vertical input signal
- 3). Trigger signal
- 4). Sweep signal

✓ Correct Answer: 2). Vertical input signal

Explanation:

Vertical amplifier boosts input signal before applying to plates.

Ref: Electronic Devices and Circuits – David A. Bell

40. Horizontal amplifier in CRO amplifies

- 1). Sweep signal
- 2). Input signal
- 3). Audio signal
- 4). RF signal

✓ Correct Answer: 1). Sweep signal

Explanation:

Horizontal amplifier amplifies ramp signal from time base generator.

Ref: Pulse and Digital Circuits – A. Anand Kumar

41. A moving coil ammeter has a full-scale current of 1 mA and resistance of 100 Ω . The voltage across the meter at full scale is

- 1). 0.01 V
- 2). 0.1 V
- 3). 1 V
- 4). 10 V

✓ Correct Answer: 2). 0.1 V

Explanation:

$$V = IR = 1 \text{ mA} \times 100 \Omega = 0.001 \times 100 = 0.1 \text{ V.}$$

Ref: A Course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney

42. To extend the range of an ammeter from 1 mA to 10 mA, a shunt resistance is used because

- 1). It increases meter sensitivity
- 2). It bypasses excess current
- 3). It increases voltage drop
- 4). It increases resistance

✓ Correct Answer: 2). It bypasses excess current

Explanation:

The shunt carries most of the current, protecting the meter movement.

Ref: Electronic Instrumentation – H.S. Kalsi

43. The sensitivity of a voltmeter is expressed in

- 1). Ω/V
- 2). V/Ω
- 3). A/V
- 4). V/A

✓ Correct Answer: 1). Ω/V

Explanation:

Voltmeter sensitivity equals reciprocal of full-scale current.

Ref: Electronic Instrumentation – H.S. Kalsi

44. A voltmeter with sensitivity $20\text{ k}\Omega/V$ on 10 V range has internal resistance

- 1). $20\text{ k}\Omega$
- 2). $100\text{ k}\Omega$
- 3). $200\text{ k}\Omega$
- 4). $2\text{ k}\Omega$

✓ Correct Answer: 3). $200\text{ k}\Omega$

Explanation:

$R = \text{Sensitivity} \times \text{Range} = 20\text{ k}\Omega/V \times 10\text{ V} = 200\text{ k}\Omega.$

Ref: A Course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney

45. An ohmmeter requires

- 1). External voltage source
- 2). Internal battery
- 3). Transformer
- 4). Oscillator

✓ Correct Answer: 2). Internal battery

Explanation:

Ohmmeter measures resistance by passing current from an internal battery.

Ref: Electronic Instrumentation – H.S. Kalsi

46. The main disadvantage of analog instruments is

- 1). High accuracy
- 2). Low cost
- 3). Parallax error
- 4). High impedance

☒ Correct Answer: 3). Parallax error

Explanation:

Reading error occurs due to pointer misalignment.

Ref: Electronic Instrumentation and Measurement Techniques – William D. Cooper and Albert D. Helfrick

47. The major advantage of digital instruments is

- 1). Low accuracy
- 2). No parallax error
- 3). Low impedance
- 4). Large power consumption

☒ Correct Answer: 2). No parallax error

Explanation:

Digital display eliminates reading errors.

Ref: Modern Electronic Instrumentation and Measurement Techniques – Helfrick & Cooper

48. In ramp type digital voltmeter, conversion time depends on

- 1). Input voltage
- 2). Reference voltage
- 3). Ramp slope
- 4). All of the above

☒ Correct Answer: 4). All of the above

Explanation:

Ramp slope and reference determine time interval measurement.

Ref: Electronic Instrumentation – H.S. Kalsi

49. The integration period in dual slope ADC improves

- 1). Noise rejection
- 2). Speed
- 3). Voltage gain
- 4). Frequency

☒ Correct Answer: 1). Noise rejection

Explanation:

Integration averages out noise.

Ref: Digital Instrumentation – A.J. Bouwens

50. Successive approximation ADC uses

- 1). Binary search algorithm
- 2). Analog integration
- 3). Frequency measurement
- 4). Voltage comparison only

☒ Correct Answer: 1). Binary search algorithm

Explanation:

It compares DAC output with input step-by-step.

Ref: Digital Instrumentation – A.J. Bouwens

51. Conversion time of successive approximation ADC is

- 1). Variable
- 2). Constant
- 3). Infinite
- 4). Zero

☒ Correct Answer: 2). Constant

Explanation:

Conversion time depends only on number of bits.

Ref: Digital Instrumentation – A.J. Bouwens

52. The digital frequency meter measures frequency by

- 1). Measuring amplitude
- 2). Counting pulses
- 3). Integrating signal
- 4). Differentiating signal

✓ Correct Answer: 2). Counting pulses

Explanation:

Frequency measured by counting cycles in known time.

Ref: Electronic Instrumentation – H.S. Kalsi

53. A digital LCR meter measures

- 1). Inductance, capacitance, resistance
- 2). Voltage, current, power
- 3). Frequency only
- 4). Phase angle only

✓ Correct Answer: 1). Inductance, capacitance, resistance

Explanation:

LCR meter determines impedance parameters.

Ref: Electronic Instrumentation – H.S. Kalsi

54. CRO vertical axis represents

- 1). Time
- 2). Voltage
- 3). Current
- 4). Power

✓ Correct Answer: 2). Voltage

Explanation:

Vertical deflection proportional to input voltage.

Ref: Electronic Devices and Circuits – David A. Bell

55. CRO horizontal axis represents

- 1). Voltage
- 2). Time
- 3). Frequency
- 4). Power

✓ Correct Answer: 2). Time

Explanation:

Time base generator controls horizontal movement.

Ref: Pulse and Digital Circuits – A. Anand Kumar

56. CRT electron beam is accelerated by

- 1). Cathode
- 2). Grid
- 3). Anode
- 4). Screen

✓ Correct Answer: 3). Anode

Explanation:

Anode accelerates electrons toward screen.

Ref: Electronic Devices and Circuits – David A. Bell

57. Phosphor coating emits

- 1). Heat
- 2). Light
- 3). Current
- 4). Voltage

✓ Correct Answer: 2). Light

Explanation:

Electron beam striking phosphor produces visible light.

Ref: Electronic Devices and Circuits – David A. Bell

58. The time base generator produces

- 1). Sine wave
- 2). Square wave
- 3). Ramp waveform
- 4). Pulse waveform

☒ Correct Answer: 3). Ramp waveform

Explanation:

Ramp voltage sweeps beam horizontally.

Ref: Pulse and Digital Circuits – A. Anand Kumar

59. Deflection sensitivity is expressed as

- 1). V/mm
- 2). mm/V
- 3). A/mm
- 4). Hz/mm

☒ Correct Answer: 2). mm/V

Explanation:

Deflection per unit voltage applied.

Ref: Electronic Devices and Circuits – David A. Bell

60. Triggered sweep circuit ensures

- 1). Stable display
- 2). Increased brightness
- 3). Increased frequency
- 4). Increased gain

☒ Correct Answer: 1). Stable display

Explanation:

Triggering synchronizes sweep with input signal.

Ref: Pulse and Digital Circuits – A. Anand Kumar

61. CRO can measure phase difference using

- 1). Time method
- 2). Lissajous patterns
- 3). Voltage measurement
- 4). Frequency counter

✓ Correct Answer: 2). Lissajous patterns

Explanation:

Lissajous figures show phase relationship.

Ref: Electronic Devices and Circuits – David A. Bell

62. AF oscillator generates frequencies typically in

- 1). 20 Hz – 20 kHz
- 2). 1 kHz – 10 MHz
- 3). 10 MHz – 100 MHz
- 4). Above 1 GHz

✓ Correct Answer: 1). 20 Hz – 20 kHz

Explanation:

Audio range frequencies correspond to human hearing.

Ref: Audio and Video Systems – R.G. Gupta

63. RF signal generator produces

- 1). Low frequency signals
- 2). Radio frequency signals
- 3). DC voltage
- 4). Audio signals

✓ Correct Answer: 2). Radio frequency signals

Explanation:

Used for testing RF circuits.

Ref: Electronic Instrumentation – H.S. Kalsi

64. A digital IC tester checks

- 1). Amplifiers
- 2). Logic ICs
- 3). Passive components
- 4). Power supplies

 Correct Answer: 2). Logic ICs

Explanation:

It verifies digital IC functionality.

Ref: Electronic Instrumentation – H.S. Kalsi

65. Audio amplifier amplifies

- 1). RF signals
- 2). Audio signals
- 3). DC signals
- 4). Microwave signals

 Correct Answer: 2). Audio signals

Explanation:

Amplifies signals within audio frequency range.

Ref: Audio and Video Systems – R.G. Gupta

66. Microphone converts

- 1). Electrical to sound
- 2). Sound to electrical
- 3). Voltage to current
- 4). Frequency to voltage

 Correct Answer: 2). Sound to electrical

Explanation:

Microphone converts acoustic signals to electrical signals.

Ref: Audio and Video Systems – R.G. Gupta

67. Loudspeaker converts

- 1). Electrical signals to sound
- 2). Sound to electrical signals
- 3). Voltage to current
- 4). Current to voltage

☒ Correct Answer: 1). Electrical signals to sound

Explanation:

Speaker converts electrical energy to sound waves.

Ref: Audio and Video Systems – R.G. Gupta

68. The preamplifier in audio system

- 1). Reduces signal strength
- 2). Amplifies weak signals
- 3). Generates frequency
- 4). Converts digital signals

☒ Correct Answer: 2). Amplifies weak signals

Explanation:

Preamplifier boosts small microphone signals.

Ref: Audio and Video Systems – R.G. Gupta

69. Power amplifier stage provides

- 1). High voltage gain only
- 2). High current gain
- 3). High frequency response
- 4). Low noise

☒ Correct Answer: 2). High current gain

Explanation:

Power amplifiers drive loudspeakers.

Ref: Audio and Video Systems – R.G. Gupta

70. CRO can measure

- 1). Voltage
- 2). Frequency
- 3). Phase difference
- 4). All of the above

☒ Correct Answer: 4). All of the above

Explanation:

CRO is versatile measurement instrument.

Ref: Electronic Devices and Circuits – David A. Bell

71. The grid in CRT controls

- 1). Beam acceleration
- 2). Beam intensity
- 3). Beam direction
- 4). Beam frequency

☒ Correct Answer: 2). Beam intensity

Explanation:

Grid voltage controls brightness.

Ref: Electronic Devices and Circuits – David A. Bell

72. Focusing anode controls

- 1). Brightness
- 2). Beam focus
- 3). Beam frequency
- 4). Voltage

☒ Correct Answer: 2). Beam focus

Explanation:

Ensures sharp spot on screen.

Ref: Electronic Devices and Circuits – David A. Bell

73. CRO storage oscilloscope can

- 1). Store waveform
- 2). Amplify signal
- 3). Generate signal
- 4). Convert signal

☒ Correct Answer: 1). Store waveform

Explanation:

Storage CRO holds waveform temporarily.

Ref: Electronic Instrumentation – H.S. Kalsi

74. Triggered sweep improves

- 1). Synchronization
- 2). Voltage gain
- 3). Frequency
- 4). Power

☒ Correct Answer: 1). Synchronization

Explanation:

Synchronizes input signal and sweep.

Ref: Pulse and Digital Circuits – A. Anand Kumar

75. RF signal generators are used to test

- 1). Audio circuits
- 2). Radio receivers
- 3). Power supplies
- 4). Batteries

☒ Correct Answer: 2). Radio receivers

Explanation:

RF signals simulate radio transmissions.

Ref: Electronic Instrumentation – H.S. Kalsi

76. In a digital frequency meter, the gate circuit is used to

- 1). Amplify input signal
- 2). Control counting interval
- 3). Convert analog signal
- 4). Increase voltage

✓ Correct Answer: 2). Control counting interval

Explanation:

The gate allows pulses to reach the counter only during a fixed time interval.

Ref: Electronic Instrumentation – H.S. Kalsi

77. The accuracy of digital instruments mainly depends on

- 1). Power supply
- 2). Resolution of display
- 3). Converter accuracy
- 4). Temperature

✓ Correct Answer: 3). Converter accuracy

Explanation:

Accuracy depends on ADC and reference voltage stability.

Ref: Modern Electronic Instrumentation and Measurement Techniques – Helfrick & Cooper

78. Resolution of a digital instrument indicates

- 1). Maximum value measurable
- 2). Smallest detectable change
- 3). Power consumption
- 4). Frequency response

✓ Correct Answer: 2). Smallest detectable change

Explanation:

Resolution determines the smallest increment detectable by the instrument.

Ref: Electronic Instrumentation – H.S. Kalsi

79. The digital LCR meter measures inductance using

- 1). Bridge method
- 2). Oscillator frequency method
- 3). Resonance method
- 4). Voltage method

✓ Correct Answer: 3). Resonance method

Explanation:

Inductance is determined by resonance conditions in measurement circuits.

Ref: Electronic Instrumentation – H.S. Kalsi

80. In CRO, the vertical amplifier should have

- 1). Low bandwidth
- 2). High bandwidth
- 3). Low gain
- 4). Low impedance

✓ Correct Answer: 2). High bandwidth

Explanation:

High bandwidth allows accurate display of high-frequency signals.

Ref: Electronic Devices and Circuits – David A. Bell

81. Horizontal sweep voltage in CRO is

- 1). Sinusoidal
- 2). Ramp shaped
- 3). Triangular
- 4). Square

✓ Correct Answer: 2). Ramp shaped

Explanation:

Ramp voltage moves the electron beam uniformly across the screen.

Ref: Pulse and Digital Circuits – A. Anand Kumar

82. Persistence of a CRT screen refers to

- 1). Brightness level
- 2). Duration of glow after excitation
- 3). Electron velocity
- 4). Beam current

✓ Correct Answer: 2). Duration of glow after excitation

Explanation:

Persistence determines how long the phosphor continues to emit light.

Ref: Electronic Devices and Circuits – David A. Bell

83. The grid in CRT controls

- 1). Beam direction
- 2). Beam intensity
- 3). Beam acceleration
- 4). Beam frequency

✓ Correct Answer: 2). Beam intensity

Explanation:

Grid voltage regulates electron beam intensity and brightness.

Ref: Electronic Devices and Circuits – David A. Bell

84. Electrostatic deflection in CRT is produced by

- 1). Magnetic coils
- 2). Deflection plates
- 3). Heater
- 4). Grid

✓ Correct Answer: 2). Deflection plates

Explanation:

Electric field between plates deflects the electron beam.

Ref: Electronic Devices and Circuits – David A. Bell

85. In CRO, the horizontal amplifier receives signal from

- 1). Vertical amplifier
- 2). Time base generator
- 3). Input probe
- 4). Trigger circuit

✓ Correct Answer: 2). Time base generator

Explanation:

Time base generator provides ramp voltage for horizontal sweep.

Ref: Pulse and Digital Circuits – A. Anand Kumar

86. The purpose of trigger circuit in CRO is to

- 1). Increase brightness
- 2). Synchronize waveform display
- 3). Increase voltage gain
- 4). Reduce frequency

✓ Correct Answer: 2). Synchronize waveform display

Explanation:

Trigger circuit ensures stable waveform display.

Ref: Pulse and Digital Circuits – A. Anand Kumar

87. Lissajous patterns on CRO screen are used to measure

- 1). Voltage
- 2). Frequency
- 3). Phase difference
- 4). Power

✓ Correct Answer: 3). Phase difference

Explanation:

Phase difference between two signals can be determined from Lissajous patterns.

Ref: Electronic Devices and Circuits – David A. Bell

88. AF oscillator commonly uses

- 1). LC circuits
- 2). RC networks
- 3). Crystal circuits
- 4). Transformer circuits

✓ Correct Answer: 2). RC networks

Explanation:

RC oscillators are suitable for generating audio frequency signals.

Ref: Audio and Video Systems – R.G. Gupta

89. The Wien bridge oscillator is widely used as

- 1). RF generator
- 2). AF oscillator
- 3). Digital generator
- 4). Pulse generator

✓ Correct Answer: 2). AF oscillator

Explanation:

Wien bridge oscillator provides stable low-frequency signals.

Ref: Audio and Video Systems – R.G. Gupta

90. RF signal generators generally operate in

- 1). Audio range
- 2). Radio frequency range
- 3). Microwave range only
- 4). DC range

✓ Correct Answer: 2). Radio frequency range

Explanation:

RF generators produce signals used for radio circuit testing.

Ref: Electronic Instrumentation – H.S. Kalsi

91. The output of RF signal generator is usually

- 1). Square wave
- 2). Sinusoidal wave
- 3). Triangular wave
- 4). Pulse wave

☒ Correct Answer: 2). Sinusoidal wave

Explanation:

RF generators produce stable sinusoidal signals.

Ref: Electronic Instrumentation – H.S. Kalsi

92. A digital IC tester is used for

- 1). Analog circuits
- 2). Logic circuits
- 3). RF circuits
- 4). Power circuits

☒ Correct Answer: 2). Logic circuits

Explanation:

It verifies functionality of digital ICs.

Ref: Electronic Instrumentation – H.S. Kalsi

93. The main advantage of digital IC tester is

- 1). Low accuracy
- 2). Automatic fault detection
- 3). High power consumption
- 4). Low speed

☒ Correct Answer: 2). Automatic fault detection

Explanation:

Digital IC testers automatically check IC functionality.

Ref: Electronic Instrumentation – H.S. Kalsi

94. The first stage in an audio system is usually

- 1). Power amplifier
- 2). Microphone
- 3). Loudspeaker
- 4). Oscillator

☒ Correct Answer: 2). Microphone

Explanation:

Microphone converts sound to electrical signals.

Ref: Audio and Video Systems – R.G. Gupta

95. Audio signals typically lie in frequency range

- 1). 20 Hz – 20 kHz
- 2). 1 Hz – 1 kHz
- 3). 1 MHz – 10 MHz
- 4). Above 10 GHz

☒ Correct Answer: 1). 20 Hz – 20 kHz

Explanation:

Human hearing range defines audio frequency band.

Ref: Audio and Video Systems – R.G. Gupta

96. The final stage in audio system is

- 1). Oscillator
- 2). Loudspeaker
- 3). Microphone
- 4). Converter

☒ Correct Answer: 2). Loudspeaker

Explanation:

Speaker converts electrical signals into sound.

Ref: Audio and Video Systems – R.G. Gupta

97. Audio amplifier output stage is designed for

- 1). High voltage gain
- 2). High current gain
- 3). Low power
- 4). Low frequency

✓ Correct Answer: 2). High current gain

Explanation:

Power stage drives loudspeaker loads.

Ref: Audio and Video Systems – R.G. Gupta

98. The dynamic microphone works on

- 1). Capacitive principle
- 2). Electromagnetic induction
- 3). Photoelectric effect
- 4). Thermal effect

✓ Correct Answer: 2). Electromagnetic induction

Explanation:

Movement of coil in magnetic field generates voltage.

Ref: Audio and Video Systems – R.G. Gupta

99. Condenser microphone works on

- 1). Variable capacitance
- 2). Electromagnetic induction
- 3). Thermal expansion
- 4). Piezoelectric effect

✓ Correct Answer: 1). Variable capacitance

Explanation:

Sound pressure changes capacitance producing electrical signal.

Ref: Audio and Video Systems – R.G. Gupta

100. Loudspeaker operates on

- 1). Electrostatic principle
- 2). Electromagnetic principle
- 3). Capacitive principle
- 4). Thermal principle

✓ Correct Answer: 2). Electromagnetic principle

Explanation:

Current in voice coil interacts with magnetic field.

Ref: Audio and Video Systems – R.G. Gupta

101. The voice coil in loudspeaker is placed in

- 1). Electric field
- 2). Magnetic field
- 3). Thermal field
- 4). Electrostatic field

✓ Correct Answer: 2). Magnetic field

Explanation:

Magnetic interaction produces mechanical movement.

Ref: Audio and Video Systems – R.G. Gupta

102. The diaphragm in loudspeaker converts

- 1). Electrical energy to mechanical vibration
- 2). Mechanical vibration to sound
- 3). Sound to electricity
- 4). Voltage to current

✓ Correct Answer: 2). Mechanical vibration to sound

Explanation:

Diaphragm vibrates to produce sound waves.

Ref: Audio and Video Systems – R.G. Gupta

103. CRO probes are used to

- 1). Increase frequency
- 2). Connect signal to CRO
- 3). Increase voltage
- 4). Reduce current

✓ Correct Answer: 2). Connect signal to CRO

Explanation:

Probes allow measurement without disturbing circuit.

Ref: Electronic Devices and Circuits – David A. Bell

104. High impedance probes reduce

- 1). Signal distortion
- 2). Voltage gain
- 3). Power consumption
- 4). Frequency response

✓ Correct Answer: 1). Signal distortion

Explanation:

High impedance prevents loading of circuit.

Ref: Electronic Devices and Circuits – David A. Bell

105. Storage oscilloscope is useful for

- 1). Continuous signals
- 2). Single transient signals
- 3). Audio signals
- 4). DC signals

✓ Correct Answer: 2). Single transient signals

Explanation:

Storage CRO holds waveform temporarily.

Ref: Electronic Instrumentation – H.S. Kalsi

106. Dual trace CRO displays

- 1). One signal
- 2). Two signals simultaneously
- 3). Three signals
- 4). Multiple signals

✓ Correct Answer: 2). Two signals simultaneously

Explanation:

Dual trace allows comparison of two signals.

Ref: Electronic Devices and Circuits – David A. Bell

107. Sampling oscilloscope is used for

- 1). Low frequency signals
- 2). High frequency signals
- 3). Audio signals
- 4). DC signals

✓ Correct Answer: 2). High frequency signals

Explanation:

Sampling technique enables measurement of very high frequencies.

Ref: Electronic Instrumentation – H.S. Kalsi

108. The sweep time control in CRO adjusts

- 1). Horizontal speed of beam
- 2). Vertical deflection
- 3). Brightness
- 4). Focus

✓ Correct Answer: 1). Horizontal speed of beam

Explanation:

Sweep time determines time scale of waveform.

Ref: Pulse and Digital Circuits – A. Anand Kumar

109. The graticule in CRO is used for

- 1). Beam control
- 2). Measurement reference
- 3). Signal generation
- 4). Voltage amplification

☒ Correct Answer: 2). Measurement reference

Explanation:

Graticule grid allows measurement of voltage and time.

Ref: Electronic Devices and Circuits – David A. Bell

110. The primary function of electronic measuring instruments is

- 1). Generate signals
- 2). Measure electrical quantities
- 3). Store energy
- 4). Convert energy

☒ Correct Answer: 2). Measure electrical quantities

Explanation:

Electronic instruments measure parameters like voltage, current, frequency and resistance.

Ref: Electronic Instrumentation – H.S. Kalsi

UNIT 4. INDUSTRIAL AND POWER ELECTRONICS

1. The device belonging to the thyristor family is

- 1). BJT
- 2). SCR
- 3). MOSFET
- 4). FET

✓ Correct Answer: 2). SCR

Explanation:

SCR (Silicon Controlled Rectifier) is a four-layer PNP device and is the most widely used thyristor.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

2. SCR stands for

- 1). Silicon Current Rectifier
- 2). Silicon Controlled Rectifier
- 3). Semiconductor Controlled Rectifier
- 4). Silicon Control Regulator

✓ Correct Answer: 2). Silicon Controlled Rectifier

Explanation:

SCR is a semiconductor switching device used for power control.

Ref: Power Electronics – P.S. Bimbhra

3. SCR has

- 1). Two layers and two terminals
- 2). Three layers and two terminals
- 3). Four layers and three terminals
- 4). Five layers and four terminals

✓ Correct Answer: 3). Four layers and three terminals

Explanation:

SCR consists of PNP layers with terminals anode, cathode and gate.

Ref: Power Electronics: Circuits, Devices and Applications – Muhammad H. Rashid

4. The three terminals of SCR are

- 1). Gate, source, drain
- 2). Anode, cathode, gate
- 3). Collector, base, emitter
- 4). Source, gate, body

☒ Correct Answer: 2). Anode, cathode, gate

Explanation:

SCR operation is controlled by the gate terminal.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

5. SCR can be turned ON by

- 1). Applying reverse voltage
- 2). Applying gate current
- 3). Removing gate current
- 4). Increasing resistance

☒ Correct Answer: 2). Applying gate current

Explanation:

Gate triggering initiates conduction between anode and cathode.

Ref: Power Electronics – P.S. Bimbhra

6. Once SCR is turned ON it remains ON until

- 1). Gate current removed
- 2). Anode current falls below holding current
- 3). Voltage increases
- 4). Resistance increases

☒ Correct Answer: 2). Anode current falls below holding current

Explanation:

SCR continues conduction until current falls below holding value.

Ref: Power Electronics: Circuits, Devices and Applications – Muhammad H. Rashid

7. TRIAC can conduct

- 1). Only positive half cycle
- 2). Only negative half cycle
- 3). Both half cycles
- 4). DC only

✓ Correct Answer: 3). Both half cycles

Explanation:

TRIAC is bidirectional thyristor used in AC control.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

8. TRIAC is equivalent to

- 1). Two SCRs in series
- 2). Two SCRs in parallel opposite direction
- 3). One diode and SCR
- 4). Two diodes

✓ Correct Answer: 2). Two SCRs in parallel opposite direction

Explanation:

TRIAC conducts current in both directions.

Ref: Power Electronics – P.S. Bimbhra

9. Power BJT is mainly used for

- 1). Low power circuits
- 2). Switching high power
- 3). Frequency generation
- 4). Signal detection

✓ Correct Answer: 2). Switching high power

Explanation:

Power BJTs handle large currents and voltages.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

10. IGBT combines features of

- 1). MOSFET and BJT
- 2). SCR and TRIAC
- 3). BJT and diode
- 4). MOSFET and diode

☒ Correct Answer: 1). MOSFET and BJT

Explanation:

IGBT offers high input impedance and high current capability.

Ref: Power Electronics: Circuits, Devices and Applications – Muhammad H. Rashid

11. The main advantage of IGBT is

- 1). Low voltage rating
- 2). High switching speed and high current capability
- 3). Low impedance input
- 4). High gate current

☒ Correct Answer: 2). High switching speed and high current capability

Explanation:

IGBT is widely used in power electronic converters.

Ref: Power Electronics – P.S. Bimbhra

12. Inverter converts

- 1). AC to DC
- 2). DC to AC
- 3). AC to AC
- 4). DC to DC

☒ Correct Answer: 2). DC to AC

Explanation:

Inverters generate AC supply from DC sources.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

13. Series inverter uses

- 1). Parallel resonant circuit
- 2). Series resonant circuit
- 3). RC circuit
- 4). RL circuit

✓ Correct Answer: 2). Series resonant circuit

Explanation:

Load components form resonant circuit in series inverter.

Ref: Power Electronics – P.S. Bimbhra

14. Parallel inverter uses

- 1). Parallel LC circuit
- 2). RC circuit
- 3). RL circuit
- 4). Diode circuit

✓ Correct Answer: 1). Parallel LC circuit

Explanation:

Parallel inverter employs LC resonance in parallel.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

15. PWM stands for

- 1). Pulse Width Modulation
- 2). Pulse Wave Modulation
- 3). Power Wave Method
- 4). Pulse Wave Measurement

✓ Correct Answer: 1). Pulse Width Modulation

Explanation:

PWM controls inverter output voltage by varying pulse width.

Ref: Power Electronics: Circuits, Devices and Applications – Muhammad H. Rashid

16. The main advantage of PWM inverter is

- 1). Low efficiency
- 2). Reduced harmonic distortion
- 3). High power loss
- 4). Low voltage

☒ Correct Answer: 2). Reduced harmonic distortion

Explanation:

PWM technique improves output waveform quality.

Ref: Power Electronics – P.S. Bimbhra

17. SMPS stands for

- 1). Switched Mode Power Supply
- 2). Switching Mode Power System
- 3). Standard Mode Power Supply
- 4). Single Mode Power Supply

☒ Correct Answer: 1). Switched Mode Power Supply

Explanation:

SMPS converts electrical power efficiently using switching devices.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

18. SMPS is preferred because of

- 1). Low efficiency
- 2). High efficiency and compact size
- 3). High heat loss
- 4). Large size

☒ Correct Answer: 2). High efficiency and compact size

Explanation:

SMPS operates at high frequency reducing transformer size.

Ref: Power Electronics – P.S. Bimbhra

19. UPS stands for

- 1). Universal Power System
- 2). Uninterruptible Power Supply
- 3). Utility Power Supply
- 4). Universal Power Source

☒ Correct Answer: 2). Uninterruptible Power Supply

Explanation:

UPS provides backup power during supply interruption.

Ref: Industrial Electronics and Control – S.K. Bhattacharya

20. Offline UPS is also called

- 1). Standby UPS
- 2). Continuous UPS
- 3). Parallel UPS
- 4). Series UPS

☒ Correct Answer: 1). Standby UPS

Explanation:

In normal operation load connected directly to mains.

Ref: Industrial Electronics – G.K. Mithal

21. Online UPS provides

- 1). Direct mains supply
- 2). Continuous power through inverter
- 3). No backup
- 4). Manual switching

☒ Correct Answer: 2). Continuous power through inverter

Explanation:

Online UPS supplies load through inverter continuously.

Ref: Industrial Electronics – G.K. Mithal

22. LDR stands for

- 1). Light Dependent Resistor
- 2). Light Digital Resistor
- 3). Low Dynamic Resistor
- 4). Linear Device Resistor

☒ Correct Answer: 1). Light Dependent Resistor

Explanation:

Resistance of LDR varies with light intensity.

Ref: Electronic Devices and Circuit Theory – Boylestad and Nashelsky

23. Resistance of LDR

- 1). Increases with light
- 2). Decreases with light
- 3). Remains constant
- 4). Becomes infinite

☒ Correct Answer: 2). Decreases with light

Explanation:

Higher illumination produces more carriers.

Ref: Optoelectronics: An Introduction – Wilson and Hawkes

24. Photodiode converts

- 1). Electrical energy to light
- 2). Light to electrical signal
- 3). Voltage to current
- 4). Current to voltage

☒ Correct Answer: 2). Light to electrical signal

Explanation:

Photodiode generates current proportional to incident light.

Ref: Electronic Devices and Circuit Theory – Boylestad and Nashelsky

25. Phototransistor provides

- 1). Higher sensitivity than photodiode
- 2). Lower sensitivity
- 3). No amplification
- 4). Only voltage output

✓ Correct Answer: 1). Higher sensitivity than photodiode

Explanation:

Phototransistor amplifies photocurrent.

Ref: Optoelectronics: An Introduction – Wilson and Hawkes

26. Photovoltaic cell converts

- 1). Electrical to light
- 2). Light to electrical energy
- 3). Heat to electricity
- 4). Mechanical to electrical

✓ Correct Answer: 2). Light to electrical energy

Explanation:

Solar cells convert solar energy into electrical energy.

Ref: Electronic Devices and Circuit Theory – Boylestad and Nashelsky

27. LVDT stands for

- 1). Linear Variable Differential Transformer
- 2). Linear Voltage Differential Transducer
- 3). Low Voltage Differential Transformer
- 4). Linear Variable Device Transformer

✓ Correct Answer: 1). Linear Variable Differential Transformer

Explanation:

LVDT measures linear displacement.

Ref: A Course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney

28. LVDT works on

- 1). Capacitive principle
- 2). Inductive principle
- 3). Resistive principle
- 4). Thermal principle

✓ Correct Answer: 2). Inductive principle

Explanation:

LVDT uses transformer action to detect displacement.

Ref: A Course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney

29. Strain gauge measures

- 1). Temperature
- 2). Pressure
- 3). Strain
- 4). Frequency

✓ Correct Answer: 3). Strain

Explanation:

Resistance of strain gauge changes with mechanical deformation.

Ref: A Course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney

30. Thermistor is used for measuring

- 1). Pressure
- 2). Temperature
- 3). Humidity
- 4). Displacement

✓ Correct Answer: 2). Temperature

Explanation:

Thermistor resistance varies strongly with temperature.

Ref: Industrial Electronics – G.K. Mithal

31. Thermocouple works on

- 1). Hall effect
- 2). Seebeck effect
- 3). Photoelectric effect
- 4). Piezoelectric effect

✓ Correct Answer: 2). Seebeck effect

Explanation:

Voltage generated due to temperature difference.

Ref: Industrial Electronics – G.K. Mithal

32. Ultrasonic waves have frequency

- 1). Below 20 Hz
- 2). 20 Hz – 20 kHz
- 3). Above 20 kHz
- 4). Above 1 GHz

✓ Correct Answer: 3). Above 20 kHz

Explanation:

Ultrasonic frequencies exceed human hearing range.

Ref: Industrial Electronics – G.K. Mithal

33. Ultrasonic waves are used in

- 1). Communication only
- 2). Flaw detection
- 3). Voltage measurement
- 4). Current measurement

✓ Correct Answer: 2). Flaw detection

Explanation:

Ultrasonics detect internal defects in materials.

Ref: Industrial Electronics – G.K. Mithal

34. Pulse echo method is used for

- 1). Temperature measurement
- 2). Ultrasonic flaw detection
- 3). Voltage detection
- 4). Frequency measurement

✓ Correct Answer: 2). Ultrasonic flaw detection

Explanation:

Reflected ultrasonic waves reveal internal defects.

Ref: Industrial Electronics – G.K. Mithal

35. Induction heating works on

- 1). Joule heating
- 2). Eddy current heating
- 3). Chemical heating
- 4). Capacitive heating

✓ Correct Answer: 2). Eddy current heating

Explanation:

Alternating magnetic field induces eddy currents producing heat.

Ref: Industrial Electronics – G.K. Mithal

36. Dielectric heating is used for

- 1). Conductors
- 2). Insulating materials
- 3). Metals only
- 4). Semiconductors

✓ Correct Answer: 2). Insulating materials

Explanation:

Dielectric heating works for non-conductive materials.

Ref: Industrial Electronics – G.K. Mithal

37. Control system is defined as

- 1). Device measuring current
- 2). System controlling output
- 3). System producing power
- 4). Device converting signals

✓ Correct Answer: 2). System controlling output

Explanation:

Control system regulates output according to input.

Ref: Control Systems – A. Anand Kumar

38. Transfer function is defined as

- 1). Output/Input in time domain
- 2). Output/Input in Laplace domain
- 3). Input/output in frequency domain
- 4). Output/input in DC circuits

✓ Correct Answer: 2). Output/Input in Laplace domain

Explanation:

Transfer function relates output to input under zero initial conditions.

Ref: Control Systems Engineering – I.J. Nagrath and M. Gopal

39. Open loop control system

- 1). Uses feedback
- 2). Does not use feedback
- 3). Uses amplifier
- 4). Uses oscillator

✓ Correct Answer: 2). Does not use feedback

Explanation:

Open loop systems operate without feedback.

Ref: Control Systems – A. Anand Kumar

40. Closed loop control system

- 1). No feedback
- 2). Uses feedback
- 3). Uses transformer
- 4). Uses oscillator

✓ Correct Answer: 2). Uses feedback

Explanation:

Closed loop systems compare output with reference input.

Ref: Control Systems Engineering – I.J. Nagrath and M. Gopal

41. The minimum anode current required to keep SCR in conduction is called

- 1). Latching current
- 2). Holding current
- 3). Gate current
- 4). Reverse current

✓ Correct Answer: 2). Holding current

Explanation:

Holding current is the minimum current below which SCR turns OFF.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

42. The minimum anode current required to turn ON SCR is

- 1). Gate current
- 2). Latching current
- 3). Reverse current
- 4). Leakage current

✓ Correct Answer: 2). Latching current

Explanation:

Latching current is the minimum current required to keep SCR ON immediately after triggering.

Ref: Power Electronics – P.S. Bimbhra

43. SCR operates in how many modes

- 1). Two
- 2). Three
- 3). Four
- 4). Five

✓ Correct Answer: 3). Three

Explanation:

SCR operates in forward blocking, forward conduction and reverse blocking modes.

Ref: Power Electronics: Circuits, Devices and Applications – Muhammad H. Rashid

44. In forward blocking mode SCR behaves like

- 1). Closed switch
- 2). Open switch
- 3). Diode
- 4). Resistor

✓ Correct Answer: 2). Open switch

Explanation:

SCR blocks current until gate trigger is applied.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

45. In forward conduction mode SCR behaves like

- 1). Open switch
- 2). Closed switch
- 3). Capacitor
- 4). Inductor

✓ Correct Answer: 2). Closed switch

Explanation:

Once triggered SCR conducts heavily like a closed switch.

Ref: Power Electronics – P.S. Bimbhra

46. TRIAC is mainly used in

- 1). DC circuits
- 2). AC power control
- 3). RF circuits
- 4). Communication circuits

✓ Correct Answer: 2). AC power control

Explanation:

TRIAC controls both halves of AC waveform.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

47. A TRIAC has how many terminals

- 1). Two
- 2). Three
- 3). Four
- 4). Five

✓ Correct Answer: 2). Three

Explanation:

TRIAC terminals are MT1, MT2 and Gate.

Ref: Power Electronics – P.S. Bimbhra

48. The main application of TRIAC is

- 1). Light dimmer
- 2). Voltage regulator
- 3). Oscillator
- 4). Rectifier

✓ Correct Answer: 1). Light dimmer

Explanation:

TRIAC widely used in lamp dimmers and AC speed control.

Ref: Power Electronics – P.S. Bimbhra

49. IGBT is mainly controlled by

- 1). Current
- 2). Voltage
- 3). Power
- 4). Frequency

☒ Correct Answer: 2). Voltage

Explanation:

IGBT is voltage-controlled like MOSFET.

Ref: Power Electronics: Circuits, Devices and Applications – Muhammad H. Rashid

50. IGBT input impedance is

- 1). Low
- 2). Moderate
- 3). High
- 4). Zero

☒ Correct Answer: 3). High

Explanation:

IGBT has MOSFET-like high input impedance.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

51. The switching speed of IGBT is

- 1). Lower than BJT
- 2). Higher than BJT
- 3). Same as SCR
- 4). Zero

☒ Correct Answer: 2). Higher than BJT

Explanation:

IGBT offers faster switching compared to BJTs.

Ref: Power Electronics – P.S. Bimbhra

52. Inverter output waveform is

- 1). DC
- 2). AC
- 3). Pulsating DC
- 4). Random

✓ Correct Answer: 2). AC

Explanation:

Inverter converts DC supply to AC output.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

53. In a single-phase inverter output frequency depends on

- 1). Load
- 2). Switching frequency
- 3). Supply voltage
- 4). Resistance

✓ Correct Answer: 2). Switching frequency

Explanation:

Output frequency controlled by switching sequence.

Ref: Power Electronics – P.S. Bimbhra

54. PWM inverter reduces

- 1). Power loss
- 2). Harmonics
- 3). Voltage
- 4). Current

✓ Correct Answer: 2). Harmonics

Explanation:

Pulse width modulation improves waveform quality.

Ref: Power Electronics: Circuits, Devices and Applications – Muhammad H. Rashid

55. SMPS works on

- 1). Linear regulation
- 2). Switching regulation
- 3). Magnetic regulation
- 4). Thermal regulation

☒ Correct Answer: 2). Switching regulation

Explanation:

SMPS uses high-frequency switching devices.

Ref: Power Electronics – P.S. Bimbhra

56. Efficiency of SMPS is typically

- 1). 30–40%
- 2). 50–60%
- 3). 80–90%
- 4). 100%

☒ Correct Answer: 3). 80–90%

Explanation:

Switching operation reduces power loss.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

57. Offline UPS supplies power to load

- 1). Through inverter always
- 2). Directly from mains during normal operation
- 3). Only from battery
- 4). Through rectifier

☒ Correct Answer: 2). Directly from mains during normal operation

Explanation:

Battery inverter used only during power failure.

Ref: Industrial Electronics – G.K. Mithal

58. Online UPS supplies power

- 1). Directly from mains
- 2). Through inverter continuously
- 3). Through transformer
- 4). Through capacitor

☒ Correct Answer: 2). Through inverter continuously

Explanation:

Load always powered by inverter.

Ref: Industrial Electronics – G.K. Mithal

59. LDR resistance in darkness is

- 1). Low
- 2). High
- 3). Zero
- 4). Negative

☒ Correct Answer: 2). High

Explanation:

Without light very few charge carriers exist.

Ref: Electronic Devices and Circuit Theory – Boylestad and Nashelsky

60. Photodiode operates in

- 1). Forward bias
- 2). Reverse bias
- 3). Zero bias
- 4). Saturation

☒ Correct Answer: 2). Reverse bias

Explanation:

Reverse bias improves response speed.

Ref: Optoelectronics – Wilson and Hawkes

61. Solar cell is also called

- 1). Photodiode
- 2). Phototransistor
- 3). Photovoltaic cell
- 4). Thermocouple

☒ Correct Answer: 3). Photovoltaic cell

Explanation:

Solar cell converts sunlight to electrical energy.

Ref: Electronic Devices and Circuit Theory – Boylestad and Nashelsky

62. LVDT measures

- 1). Pressure
- 2). Displacement
- 3). Temperature
- 4). Humidity

☒ Correct Answer: 2). Displacement

Explanation:

Output voltage proportional to core displacement.

Ref: A Course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney

63. LVDT output is

- 1). DC voltage
- 2). AC voltage
- 3). Current
- 4). Resistance

☒ Correct Answer: 2). AC voltage

Explanation:

Secondary voltage depends on core position.

Ref: A Course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney

64. Strain gauge works on

- 1). Capacitance change
- 2). Resistance change
- 3). Inductance change
- 4). Voltage change

☒ Correct Answer: 2). Resistance change

Explanation:

Mechanical strain alters electrical resistance.

Ref: A Course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney

65. Thermistor has

- 1). Positive temperature coefficient
- 2). Negative temperature coefficient
- 3). Zero coefficient
- 4). Infinite coefficient

☒ Correct Answer: 2). Negative temperature coefficient

Explanation:

Resistance decreases with temperature rise.

Ref: Industrial Electronics – G.K. Mithal

66. Thermocouple generates voltage due to

- 1). Hall effect
- 2). Seebeck effect
- 3). Joule effect
- 4). Faraday effect

☒ Correct Answer: 2). Seebeck effect

Explanation:

Temperature difference produces thermoelectric voltage.

Ref: Industrial Electronics – G.K. Mithal

67. Ultrasonic waves travel with speed

- 1). Equal to light
- 2). Equal to sound
- 3). Higher than sound
- 4). Lower than sound

✓ Correct Answer: 2). Equal to sound

Explanation:

Ultrasonic waves are sound waves above audible range.

Ref: Industrial Electronics – G.K. Mithal

68. Pulse echo method detects

- 1). Surface defects
- 2). Internal defects
- 3). Temperature
- 4). Voltage

✓ Correct Answer: 2). Internal defects

Explanation:

Reflected ultrasonic pulses indicate defects.

Ref: Industrial Electronics – G.K. Mithal

69. Induction heating mainly heats

- 1). Conductors
- 2). Insulators
- 3). Semiconductors
- 4). Gases

✓ Correct Answer: 1). Conductors

Explanation:

Eddy currents generate heat in metals.

Ref: Industrial Electronics – G.K. Mithal

70. Dielectric heating mainly heats

- 1). Metals
- 2). Insulators
- 3). Semiconductors
- 4). Liquids

✓ Correct Answer: 2). Insulators

Explanation:

Polar molecules generate heat in alternating electric field.

Ref: Industrial Electronics – G.K. Mithal

71. Transfer function relates

- 1). Output voltage to input voltage in Laplace domain
- 2). Output voltage to input current
- 3). Input voltage to output voltage
- 4). Current to resistance

✓ Correct Answer: 1). Output voltage to input voltage in Laplace domain

Explanation:

Transfer function = Output/Input under zero initial conditions.

Ref: Control Systems Engineering – I.J. Nagrath and M. Gopal

72. Open loop system

- 1). Uses feedback
- 2). No feedback
- 3). Uses amplifier
- 4). Uses inverter

✓ Correct Answer: 2). No feedback

Explanation:

Output not compared with input.

Ref: Control Systems – A. Anand Kumar

73. Closed loop system

- 1). Has feedback
- 2). No feedback
- 3). Uses SCR
- 4). Uses inverter

✓ Correct Answer: 1). Has feedback

Explanation:

Output compared with reference signal.

Ref: Control Systems – A. Anand Kumar

74. Example of open loop system

- 1). Electric iron thermostat
- 2). Traffic light timer
- 3). Speed control system
- 4). Voltage regulator

✓ Correct Answer: 2). Traffic light timer

Explanation:

Operation independent of output conditions.

Ref: Control Systems Engineering – I.J. Nagrath and M. Gopal

75. Example of closed loop system

- 1). Electric heater with thermostat
- 2). Traffic light timer
- 3). Water pump
- 4). Light bulb

✓ Correct Answer: 1). Electric heater with thermostat

Explanation:

Temperature feedback controls heater.

Ref: Control Systems – A. Anand Kumar

76. The gate of an SCR is used to

- 1). Turn OFF the SCR
- 2). Control the conduction process
- 3). Increase voltage
- 4). Increase current

✓ Correct Answer: 2). Control the conduction process

Explanation:

Gate current initiates conduction in SCR by triggering the device from forward blocking to forward conduction region.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

77. SCR is primarily used for

- 1). Signal amplification
- 2). Power control
- 3). Frequency generation
- 4). Voltage measurement

✓ Correct Answer: 2). Power control

Explanation:

SCRs are widely used in controlled rectifiers and power regulation circuits.

Ref: Power Electronics – P.S. Bimbhra

78. TRIAC triggering is usually done by

- 1). Gate pulse
- 2). Anode current
- 3). Cathode voltage
- 4). Load current

✓ Correct Answer: 1). Gate pulse

Explanation:

A gate pulse initiates conduction in either direction for TRIAC.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

79. A TRIAC can replace

- 1). One SCR
- 2). Two SCRs connected in anti-parallel
- 3). Two diodes
- 4). One transistor

✓ Correct Answer: 2). Two SCRs connected in anti-parallel

Explanation:

TRIAC conducts current in both directions similar to two anti-parallel SCRs.

Ref: Power Electronics – P.S. Bimbhra

80. The main advantage of IGBT over BJT is

- 1). Higher input current
- 2). Voltage-controlled operation
- 3). Higher power loss
- 4). Low switching speed

✓ Correct Answer: 2). Voltage-controlled operation

Explanation:

IGBT requires very small gate current due to MOS gate structure.

Ref: Power Electronics: Circuits, Devices and Applications – Muhammad H. Rashid

81. Power BJT operates mainly in

- 1). Active region
- 2). Cutoff region
- 3). Saturation and cutoff regions
- 4). Breakdown region

✓ Correct Answer: 3). Saturation and cutoff regions

Explanation:

Power BJTs operate as switches in power electronics.

Ref: Power Electronics – P.S. Bimbhra

82. The main application of an inverter is

- 1). Convert AC to DC
- 2). Convert DC to AC
- 3). Convert AC to AC
- 4). Convert DC to DC

☒ Correct Answer: 2). Convert DC to AC

Explanation:

Inverters produce AC output from DC sources such as batteries.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

83. A series inverter uses

- 1). Parallel LC circuit
- 2). Series LC circuit
- 3). RC circuit
- 4). RL circuit

☒ Correct Answer: 2). Series LC circuit

Explanation:

Load components form a series resonant circuit.

Ref: Power Electronics – P.S. Bimbhra

84. Parallel inverter uses

- 1). Series LC circuit
- 2). Parallel LC circuit
- 3). RC circuit
- 4). RL circuit

☒ Correct Answer: 2). Parallel LC circuit

Explanation:

Parallel resonance is used to produce alternating current output.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

85. PWM technique controls

- 1). Frequency
- 2). Voltage magnitude
- 3). Current only
- 4). Power factor

✓ Correct Answer: 2). Voltage magnitude

Explanation:

Pulse width modulation varies duty cycle to control output voltage.

Ref: Power Electronics: Circuits, Devices and Applications – Muhammad H. Rashid

86. The major advantage of PWM inverter is

- 1). Reduced harmonics
- 2). Increased distortion
- 3). Low efficiency
- 4). Low power output

✓ Correct Answer: 1). Reduced harmonics

Explanation:

PWM produces nearly sinusoidal waveform with low harmonic content.

Ref: Power Electronics – P.S. Bimbhra

87. SMPS reduces size because

- 1). Uses high frequency switching
- 2). Uses large transformer
- 3). Uses linear regulation
- 4). Uses low frequency

✓ Correct Answer: 1). Uses high frequency switching

Explanation:

High frequency reduces transformer size.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

88. UPS provides

- 1). Continuous power supply during failure
- 2). Increased voltage only
- 3). Reduced current
- 4). Frequency regulation only

✓ Correct Answer: 1). Continuous power supply during failure

Explanation:

UPS ensures uninterrupted power to critical loads.

Ref: Industrial Electronics – G.K. Mithal

89. In LDR applications the resistance is minimum when

- 1). No light
- 2). Bright light
- 3). Moderate light
- 4). High voltage

✓ Correct Answer: 2). Bright light

Explanation:

Light increases charge carriers reducing resistance.

Ref: Electronic Devices and Circuit Theory – Boylestad and Nashelsky

90. Phototransistor is basically

- 1). Photodiode with amplification
- 2). LDR with transistor
- 3). Diode with capacitor
- 4). SCR with photodiode

✓ Correct Answer: 1). Photodiode with amplification

Explanation:

Phototransistor amplifies photocurrent using transistor action.

Ref: Optoelectronics – Wilson and Hawkes

91. Solar cell produces

- 1). AC voltage
- 2). DC voltage
- 3). Pulsating voltage
- 4). High frequency voltage

☒ Correct Answer: 2). DC voltage

Explanation:

Photovoltaic effect produces direct voltage.

Ref: Electronic Devices and Circuit Theory – Boylestad and Nashelsky

92. LVDT output voltage is proportional to

- 1). Pressure
- 2). Displacement
- 3). Temperature
- 4). Current

☒ Correct Answer: 2). Displacement

Explanation:

Output changes according to core movement.

Ref: A Course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney

93. Strain gauge factor represents

- 1). Resistance change with strain
- 2). Voltage change with current
- 3). Temperature change with resistance
- 4). Frequency change with voltage

☒ Correct Answer: 1). Resistance change with strain

Explanation:

Gauge factor indicates sensitivity of strain gauge.

Ref: A Course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney

94. Thermistor resistance

- 1). Increases with temperature
- 2). Decreases with temperature
- 3). Remains constant
- 4). Becomes zero

✓ Correct Answer: 2). Decreases with temperature

Explanation:

NTC thermistors decrease resistance with temperature rise.

Ref: Industrial Electronics – G.K. Mithal

95. Thermocouple output is

- 1). AC voltage
- 2). DC voltage
- 3). Current
- 4). Resistance

✓ Correct Answer: 2). DC voltage

Explanation:

Seebeck effect produces DC voltage.

Ref: Industrial Electronics – G.K. Mithal

96. Ultrasonic frequency range is

- 1). Below 20 Hz
- 2). 20 Hz – 20 kHz
- 3). Above 20 kHz
- 4). Above 1 MHz

✓ Correct Answer: 3). Above 20 kHz

Explanation:

Ultrasonic waves exceed human hearing limit.

Ref: Industrial Electronics – G.K. Mithal

97. Pulse echo technique measures

- 1). Voltage
- 2). Internal defects in materials
- 3). Current
- 4). Resistance

☒ Correct Answer: 2). Internal defects in materials

Explanation:

Reflected ultrasonic pulses indicate flaws.

Ref: Industrial Electronics – G.K. Mithal

98. Induction heating is used for

- 1). Plastic heating
- 2). Metal heating
- 3). Chemical heating
- 4). Water heating

☒ Correct Answer: 2). Metal heating

Explanation:

Eddy currents produce heat in conductive materials.

Ref: Industrial Electronics – G.K. Mithal

99. Dielectric heating is suitable for

- 1). Conductors
- 2). Insulators
- 3). Metals
- 4). Semiconductors

☒ Correct Answer: 2). Insulators

Explanation:

Polar molecules generate heat under alternating electric field.

Ref: Industrial Electronics – G.K. Mithal

100. In a closed loop control system

- 1). No feedback exists
- 2). Output is compared with input
- 3). Only input exists
- 4). Only output exists

 Correct Answer: 2). Output is compared with input

Explanation:

Feedback reduces error between desired and actual output.

Ref: Control Systems – A. Anand Kumar

UNIT 5. COMMUNICATION SYSTEMS

1. The process of combining information signal with carrier signal is called

- 1). Detection
- 2). Modulation
- 3). Demodulation
- 4). Multiplexing

✓ Correct Answer: 2). Modulation

Explanation:

Modulation shifts the baseband signal to a higher frequency carrier for efficient transmission.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

2. The main purpose of modulation is to

- 1). Increase signal amplitude
- 2). Reduce noise
- 3). Enable efficient transmission over long distances
- 4). Reduce bandwidth

✓ Correct Answer: 3). Enable efficient transmission over long distances

Explanation:

Modulation allows signals to be transmitted efficiently using antennas.

Ref: Communication Systems – Simon Haykin

3. In amplitude modulation, the parameter varied according to message signal is

- 1). Frequency
- 2). Phase
- 3). Amplitude
- 4). Time

✓ Correct Answer: 3). Amplitude

Explanation:

In AM, carrier amplitude varies proportional to the message signal.

Ref: Principles of Communication Systems – Taub and Schilling

4. The modulation index of AM is defined as

- 1). Carrier amplitude / modulating amplitude
- 2). Modulating amplitude / carrier amplitude
- 3). Carrier frequency / message frequency
- 4). Message frequency / carrier frequency

☒ Correct Answer: 2). Modulating amplitude / carrier amplitude

Explanation:

Modulation index determines depth of modulation.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

5. If modulation index exceeds 1 in AM, the signal becomes

- 1). Perfect modulation
- 2). Overmodulated
- 3). Undermodulated
- 4). Linear

☒ Correct Answer: 2). Overmodulated

Explanation:

Overmodulation causes distortion in demodulated signal.

Ref: Communication Systems – Simon Haykin

6. Bandwidth of an AM signal is

- 1). f_m
- 2). f_c
- 3). $2f_m$
- 4). $2f_c$

☒ Correct Answer: 3). $2f_m$

Explanation:

AM bandwidth equals twice the maximum modulating frequency.

Ref: Principles of Communication Systems – Taub and Schilling

7. Total power in AM signal is

- 1). P_c
- 2). $P_c(1+m^2/2)$
- 3). $P_c(1+m^2)$
- 4). $P_c(m^2/2)$

✓ Correct Answer: 2). $P_c(1+m^2/2)$

Explanation:

Total transmitted power includes carrier and sideband power.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

8. Frequency modulation varies

- 1). Carrier amplitude
- 2). Carrier frequency
- 3). Carrier phase
- 4). Carrier power

✓ Correct Answer: 2). Carrier frequency

Explanation:

FM varies frequency proportional to message signal.

Ref: Communication Systems – Simon Haykin

9. Phase modulation varies

- 1). Carrier amplitude
- 2). Carrier frequency
- 3). Carrier phase
- 4). Carrier power

✓ Correct Answer: 3). Carrier phase

Explanation:

In PM the phase of the carrier changes according to the modulating signal.

Ref: Principles of Communication Systems – Taub and Schilling

10. FM bandwidth is determined using

- 1). Carson's rule
- 2). Nyquist rule
- 3). Shannon theorem
- 4). Hartley theorem

✓ Correct Answer: 1). Carson's rule

Explanation:

FM bandwidth $\approx 2(\Delta f + f_m)$.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

11. In AM transmitter, modulation occurs at

- 1). Audio stage
- 2). RF stage
- 3). Power supply
- 4). Antenna stage

✓ Correct Answer: 2). RF stage

Explanation:

Carrier and modulating signal combine in RF section.

Ref: Communication Systems – Simon Haykin

12. Low level modulation occurs

- 1). After power amplifier
- 2). Before power amplifier
- 3). In antenna
- 4). In receiver

✓ Correct Answer: 2). Before power amplifier

Explanation:

Low-level modulation occurs before RF power amplification.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

13. High level modulation occurs

- 1). After RF amplification
- 2). Before RF amplification
- 3). At antenna
- 4). At mixer

☒ Correct Answer: 1). After RF amplification

Explanation:

Modulation applied at power amplifier stage.

Ref: Communication Systems – Simon Haykin

14. SSB transmission means

- 1). Single Side Band
- 2). Small Signal Band
- 3). Single Signal Band
- 4). Separate Side Band

☒ Correct Answer: 1). Single Side Band

Explanation:

Only one sideband transmitted improving efficiency.

Ref: Principles of Communication Systems – Taub and Schilling

15. Advantage of SSB transmission is

- 1). Increased bandwidth
- 2). Reduced bandwidth
- 3). Reduced power efficiency
- 4). Increased noise

☒ Correct Answer: 2). Reduced bandwidth

Explanation:

SSB uses only one sideband saving spectrum.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

16. The most widely used radio receiver is

- 1). Crystal receiver
- 2). Superheterodyne receiver
- 3). Regenerative receiver
- 4). Direct conversion receiver

✓ Correct Answer: 2). Superheterodyne receiver

Explanation:

Superheterodyne receivers provide high selectivity and sensitivity.

Ref: Communication Systems – Simon Haykin

17. In superheterodyne receiver, signal is converted to

- 1). High frequency
- 2). Intermediate frequency
- 3). Zero frequency
- 4). Audio frequency

✓ Correct Answer: 2). Intermediate frequency

Explanation:

Mixing converts RF signal to fixed IF for easier amplification.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

18. The typical IF used in AM receiver is

- 1). 455 kHz
- 2). 1 MHz
- 3). 100 kHz
- 4). 10 MHz

✓ Correct Answer: 1). 455 kHz

Explanation:

455 kHz provides good selectivity and stability.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

19. Sensitivity of receiver refers to

- 1). Ability to reject unwanted signals
- 2). Ability to detect weak signals
- 3). Ability to reduce noise
- 4). Ability to increase power

✓ Correct Answer: 2). Ability to detect weak signals

Explanation:

Sensitivity indicates minimum detectable signal.

Ref: Communication Systems – Simon Haykin

20. Selectivity of receiver refers to

- 1). Detect weak signals
- 2). Reject unwanted frequencies
- 3). Increase power
- 4). Increase bandwidth

✓ Correct Answer: 2). Reject unwanted frequencies

Explanation:

Selectivity allows receiver to separate desired signal from others.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

21. Fidelity refers to

- 1). Accuracy of reproduced signal
- 2). Signal power
- 3). Signal bandwidth
- 4). Signal frequency

✓ Correct Answer: 1). Accuracy of reproduced signal

Explanation:

Fidelity measures faithfulness of reproduced signal.

Ref: Communication Systems – Simon Haykin

22. Image frequency in superheterodyne receiver causes

- 1). Signal distortion
- 2). Interference
- 3). Power loss
- 4). Frequency shift

✓ Correct Answer: 2). Interference

Explanation:

Image signals produce unwanted interference in receiver.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

23. IMRR stands for

- 1). Image Modulation Rejection Ratio
- 2). Image Frequency Rejection Ratio
- 3). Intermediate Modulation Ratio
- 4). Image Mixing Ratio

✓ Correct Answer: 2). Image Frequency Rejection Ratio

Explanation:

IMRR measures receiver's ability to reject image frequency.

Ref: Communication Systems – Simon Haykin

24. Ground wave propagation occurs

- 1). Along earth surface
- 2). Through ionosphere
- 3). Through space only
- 4). Through atmosphere only

✓ Correct Answer: 1). Along earth surface

Explanation:

Ground waves follow curvature of earth.

Ref: Antennas and Wave Propagation – K.D. Prasad

25. Sky wave propagation uses

- 1). Troposphere
- 2). Ionosphere
- 3). Stratosphere
- 4). Mesosphere

✓ Correct Answer: 2). Ionosphere

Explanation:

Radio waves reflect from ionosphere layers.

Ref: Antennas and Wave Propagation – John D. Kraus

26. Space wave propagation is used in

- 1). Radio broadcasting
- 2). Satellite communication
- 3). Long wave communication
- 4). Submarine communication

✓ Correct Answer: 2). Satellite communication

Explanation:

Space waves travel directly between antennas.

Ref: Antennas and Wave Propagation – K.D. Prasad

27. Pulse Code Modulation converts

- 1). Digital to analog
- 2). Analog to digital
- 3). Frequency to voltage
- 4). Voltage to frequency

✓ Correct Answer: 2). Analog to digital

Explanation:

PCM digitizes analog signals using sampling, quantization and encoding.

Ref: Digital Communications – Sanjay Sharma

28. Delta modulation is used for

- 1). Signal amplification
- 2). Digital encoding
- 3). Noise reduction
- 4). Frequency modulation

☒ Correct Answer: 2). Digital encoding

Explanation:

Delta modulation encodes difference between successive samples.

Ref: Digital Communications – Sanjay Sharma

29. In PCM the first step is

- 1). Encoding
- 2). Sampling
- 3). Quantization
- 4). Detection

☒ Correct Answer: 2). Sampling

Explanation:

Analog signal is first sampled at regular intervals.

Ref: Principles of Digital Communication – J. Das, S.K. Tyagi and M.C. Mallick

30. Nyquist sampling theorem states sampling frequency must be

- 1). Equal to signal frequency
- 2). Twice the signal frequency
- 3). Half the signal frequency
- 4). Four times the signal frequency

☒ Correct Answer: 2). Twice the signal frequency

Explanation:

Sampling rate $\geq 2f_m$ prevents aliasing.

Ref: Digital Communications – Sanjay Sharma

31. The second step in PCM after sampling is

- 1). Detection
- 2). Quantization
- 3). Encoding
- 4). Transmission

✓ Correct Answer: 2). Quantization

Explanation:

Quantization converts sampled analog values into discrete amplitude levels.

Ref: Digital Communications – Sanjay Sharma

32. Quantization error occurs due to

- 1). Sampling
- 2). Encoding
- 3). Finite number of quantization levels
- 4). Transmission noise

✓ Correct Answer: 3). Finite number of quantization levels

Explanation:

Quantization error is the difference between actual sample value and quantized value.

Ref: Digital and Analog Communication Systems – K. Sam Shanmugam

33. In PCM the binary representation of quantized values is called

- 1). Detection
- 2). Encoding
- 3). Sampling
- 4). Multiplexing

✓ Correct Answer: 2). Encoding

Explanation:

Each quantized level is assigned a binary code.

Ref: Principles of Digital Communication – J. Das, S.K. Tyagi and M.C. Mallick

34. Delta modulation transmits

- 1). Absolute signal values
- 2). Difference between successive samples
- 3). Carrier frequency
- 4). Modulating frequency

✓ Correct Answer: 2). Difference between successive samples

Explanation:

Delta modulation encodes only change in amplitude.

Ref: Digital Communications – Sanjay Sharma

35. Delta modulation suffers from

- 1). Aliasing
- 2). Slope overload distortion
- 3). Phase distortion
- 4). Frequency distortion

✓ Correct Answer: 2). Slope overload distortion

Explanation:

Occurs when signal changes faster than modulator tracking ability.

Ref: Digital and Analog Communication Systems – K. Sam Shanmugam

36. In ASK modulation the parameter varied is

- 1). Amplitude
- 2). Frequency
- 3). Phase
- 4). Time

✓ Correct Answer: 1). Amplitude

Explanation:

Binary data changes amplitude of carrier.

Ref: Digital Communications – Sanjay Sharma

37. In FSK modulation the parameter varied is

- 1). Amplitude
- 2). Frequency
- 3). Phase
- 4). Bandwidth

✓ Correct Answer: 2). Frequency

Explanation:

Binary data shifts between two carrier frequencies.

Ref: Digital Communications – Sanjay Sharma

38. In PSK modulation the parameter varied is

- 1). Amplitude
- 2). Frequency
- 3). Phase
- 4). Power

✓ Correct Answer: 3). Phase

Explanation:

Binary data changes phase of carrier.

Ref: Principles of Digital Communication – J. Das, S.K. Tyagi and M.C. Mallick

39. Binary Phase Shift Keying uses

- 1). Two phases
- 2). Four phases
- 3). Eight phases
- 4). Sixteen phases

✓ Correct Answer: 1). Two phases

Explanation:

BPSK uses 0° and 180° phase shifts.

Ref: Digital Communications – Sanjay Sharma

40. QAM stands for

- 1). Quadrature Amplitude Modulation
- 2). Quality Amplitude Modulation
- 3). Quantum Amplitude Modulation
- 4). Quadratic Amplitude Modulation

✓ Correct Answer: 1). Quadrature Amplitude Modulation

Explanation:

QAM combines amplitude and phase modulation.

Ref: Digital Communications – Sanjay Sharma

41. ASK detection is usually done using

- 1). Envelope detector
- 2). Phase detector
- 3). Frequency discriminator
- 4). Mixer

✓ Correct Answer: 1). Envelope detector

Explanation:

Envelope detector recovers amplitude variations.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

42. FSK detection uses

- 1). Frequency discriminator
- 2). Envelope detector
- 3). Phase detector
- 4). Mixer

✓ Correct Answer: 1). Frequency discriminator

Explanation:

Frequency discriminator identifies different frequencies.

Ref: Digital Communications – Sanjay Sharma

43. PSK detection requires

- 1). Coherent detection
- 2). Envelope detection
- 3). Rectification
- 4). Amplification

✓ Correct Answer: 1). Coherent detection

Explanation:

PSK demodulation requires phase synchronization.

Ref: Digital Communications – Sanjay Sharma

44. Data codes are used for

- 1). Signal amplification
- 2). Digital representation of data
- 3). Noise reduction
- 4). Carrier generation

✓ Correct Answer: 2). Digital representation of data

Explanation:

Data codes convert information into digital format.

Ref: Digital Communications – Sanjay Sharma

45. Synchronous transmission requires

- 1). Separate clock signal
- 2). No timing signal
- 3). Variable timing
- 4). Random timing

✓ Correct Answer: 1). Separate clock signal

Explanation:

Sender and receiver share a common clock.

Ref: Digital and Analog Communication Systems – K. Sam Shanmugam

46. Asynchronous transmission

- 1). Uses common clock
- 2). Uses start and stop bits
- 3). Requires high bandwidth
- 4). Uses carrier signals

✓ Correct Answer: 2). Uses start and stop bits

Explanation:

Data transmitted character by character.

Ref: Digital Communications – Sanjay Sharma

47. Error detection method includes

- 1). Parity check
- 2). Amplitude modulation
- 3). Frequency modulation
- 4). Phase modulation

✓ Correct Answer: 1). Parity check

Explanation:

Parity bits detect transmission errors.

Ref: Digital Communications – Sanjay Sharma

48. Error correction method includes

- 1). Hamming code
- 2). ASK
- 3). FSK
- 4). PCM

✓ Correct Answer: 1). Hamming code

Explanation:

Hamming code detects and corrects errors.

Ref: Digital Communications – Sanjay Sharma

49. Multiplexing is

- 1). Combining multiple signals
- 2). Splitting signals
- 3). Amplifying signals
- 4). Detecting signals

✓ Correct Answer: 1). Combining multiple signals

Explanation:

Multiplexing transmits multiple signals over single channel.

Ref: Communication Systems – Simon Haykin

50. FDM stands for

- 1). Frequency Division Multiplexing
- 2). Fast Division Multiplexing
- 3). Frequency Data Multiplexing
- 4). Fast Data Modulation

✓ Correct Answer: 1). Frequency Division Multiplexing

Explanation:

Each signal occupies different frequency band.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

51. In FDM channels are separated by

- 1). Time slots
- 2). Frequency bands
- 3). Voltage levels
- 4). Phase shifts

✓ Correct Answer: 2). Frequency bands

Explanation:

Each channel occupies unique frequency.

Ref: Communication Systems – Simon Haykin

52. TDM stands for

- 1). Time Division Multiplexing
- 2). Transmission Data Modulation
- 3). Time Data Multiplexing
- 4). Time Detection Method

✓ Correct Answer: 1). Time Division Multiplexing

Explanation:

Each signal transmitted in different time slot.

Ref: Digital Communications – Sanjay Sharma

53. In TDM signals share

- 1). Frequency band
- 2). Time slots
- 3). Voltage levels
- 4). Phase shifts

✓ Correct Answer: 2). Time slots

Explanation:

Signals transmitted sequentially in time.

Ref: Digital Communications – Sanjay Sharma

54. TDMA stands for

- 1). Time Division Multiple Access
- 2). Transmission Data Multiple Access
- 3). Time Data Modulation Access
- 4). Time Digital Modulation Access

✓ Correct Answer: 1). Time Division Multiple Access

Explanation:

Multiple users share channel in different time slots.

Ref: Digital Communications – Sanjay Sharma

55. Ground wave propagation is suitable for

- 1). Long distance HF communication
- 2). Local broadcasting
- 3). Satellite communication
- 4). Microwave communication

✓ Correct Answer: 2). Local broadcasting

Explanation:

Ground waves follow earth surface.

Ref: Antennas and Wave Propagation – K.D. Prasad

56. Sky wave propagation is mainly used for

- 1). Long distance HF communication
- 2). Television broadcasting
- 3). Satellite communication
- 4). Radar

✓ Correct Answer: 1). Long distance HF communication

Explanation:

Ionosphere reflects HF waves enabling long-distance communication.

Ref: Antennas and Wave Propagation – John D. Kraus

57. Space wave propagation occurs between

- 1). Earth surface and antenna
- 2). Two antennas in line of sight
- 3). Earth and ionosphere
- 4). Ground and ocean

✓ Correct Answer: 2). Two antennas in line of sight

Explanation:

Used in satellite and microwave communication.

Ref: Antennas and Wave Propagation – K.D. Prasad

58. The D layer of ionosphere

- 1). Reflects radio waves
- 2). Absorbs radio waves
- 3). Generates signals
- 4). Amplifies signals

✓ Correct Answer: 2). Absorbs radio waves

Explanation:

D layer absorbs low frequency signals during daytime.

Ref: Antennas and Wave Propagation – John D. Kraus

59. E and F layers of ionosphere

- 1). Reflect radio waves
- 2). Absorb radio waves
- 3). Generate signals
- 4). Amplify signals

✓ Correct Answer: 1). Reflect radio waves

Explanation:

These layers enable sky wave communication.

Ref: Antennas and Wave Propagation – K.D. Prasad

60. IF frequency of FM receiver is usually

- 1). 455 kHz
- 2). 10.7 MHz
- 3). 1 MHz
- 4). 100 kHz

✓ Correct Answer: 2). 10.7 MHz

Explanation:

FM receivers use higher IF frequency than AM receivers.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

81. The deviation ratio in FM is defined as

- 1). $\Delta f / f_m$
- 2). $f_m / \Delta f$
- 3). f_c / f_m
- 4). f_m / f_c

✓ Correct Answer: 1). $\Delta f / f_m$

Explanation:

Deviation ratio is the ratio of maximum frequency deviation to maximum modulating frequency.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

82. If modulation index of AM is 0.5, sideband power is

- 1). $P_c/4$
- 2). $P_c/8$
- 3). $P_c/2$
- 4). P_c

✓ Correct Answer: 2). $P_c/8$

Explanation:

Sideband power = $P_c(m^2/4)$. For $m = 0.5 \rightarrow P_c(0.25/4) = P_c/16$ per sideband, total = $P_c/8$.

Ref: Principles of Communication Systems – Taub and Schilling

83. Carrier power in AM is

- 1). P_c
- 2). $P_c(m^2)$
- 3). $P_c/2$
- 4). $P_c(1+m^2/2)$

✓ Correct Answer: 1). P_c

Explanation:

Carrier power remains constant regardless of modulation index.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

84. The AM detector commonly used is

- 1). Frequency discriminator
- 2). Envelope detector
- 3). Phase detector
- 4). Balanced modulator

☒ Correct Answer: 2). Envelope detector

Explanation:

Envelope detector recovers modulating signal from AM waveform.

Ref: Communication Systems – Simon Haykin

85. In FM, noise immunity is

- 1). Poor
- 2). Moderate
- 3). Better than AM
- 4). Same as AM

☒ Correct Answer: 3). Better than AM

Explanation:

Frequency modulation suppresses amplitude noise.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

86. Frequency deviation in FM depends on

- 1). Carrier amplitude
- 2). Carrier frequency
- 3). Amplitude of modulating signal
- 4). Bandwidth

☒ Correct Answer: 3). Amplitude of modulating signal

Explanation:

Greater modulating amplitude produces larger frequency deviation.

Ref: Communication Systems – Simon Haykin

87. The modulation index of FM is

- 1). f_m / f_c
- 2). $\Delta f / f_m$
- 3). f_c / f_m
- 4). $f_m / \Delta f$

✓ Correct Answer: 2). $\Delta f / f_m$

Explanation:

FM modulation index equals frequency deviation divided by modulating frequency.

Ref: Principles of Communication Systems – Taub and Schilling

88. Narrowband FM occurs when

- 1). $\beta \gg 1$
- 2). $\beta \ll 1$
- 3). $\beta = 1$
- 4). $\beta = 0$

✓ Correct Answer: 2). $\beta \ll 1$

Explanation:

Narrowband FM occurs when modulation index is small.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

89. Wideband FM occurs when

- 1). $\beta \ll 1$
- 2). $\beta \approx 1$
- 3). $\beta \gg 1$
- 4). $\beta = 0$

✓ Correct Answer: 3). $\beta \gg 1$

Explanation:

Wideband FM produces large bandwidth signals.

Ref: Communication Systems – Simon Haykin

90. FM demodulation commonly uses

- 1). Envelope detector
- 2). Frequency discriminator
- 3). Balanced modulator
- 4). Mixer

☒ Correct Answer: 2). Frequency discriminator

Explanation:

Frequency discriminator converts frequency variations into voltage.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

91. The mixer stage in superheterodyne receiver

- 1). Amplifies signal
- 2). Converts RF to IF
- 3). Demodulates signal
- 4). Filters signal

☒ Correct Answer: 2). Converts RF to IF

Explanation:

Mixer combines RF and local oscillator signals to produce intermediate frequency.

Ref: Communication Systems – Simon Haykin

92. The local oscillator frequency is

- 1). Equal to IF
- 2). Equal to RF
- 3). $RF \pm IF$
- 4). $IF/2$

☒ Correct Answer: 3). $RF \pm IF$

Explanation:

Local oscillator generates signal whose difference with RF equals IF.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

93. Image frequency in receiver occurs due to

- 1). Amplifier distortion
- 2). Mixer operation
- 3). Detector failure
- 4). Oscillator noise

✓ Correct Answer: 2). Mixer operation

Explanation:

Mixer produces unwanted frequency responses known as image frequencies.

Ref: Communication Systems – Simon Haykin

94. The image frequency rejection improves with

- 1). High IF
- 2). Low IF
- 3). High carrier frequency
- 4). High modulating frequency

✓ Correct Answer: 1). High IF

Explanation:

Higher IF increases separation between desired and image frequency.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

95. The fidelity of receiver depends mainly on

- 1). RF amplifier
- 2). Detector
- 3). Audio amplifier
- 4). Antenna

✓ Correct Answer: 3). Audio amplifier

Explanation:

Audio amplifier reproduces modulating signal accurately.

Ref: Communication Systems – Simon Haykin

96. In PCM, bit rate is

- 1). Sampling rate $\times$ bits per sample
- 2). Sampling rate / bits
- 3). Bits / sampling rate
- 4). Frequency / bits

✓ Correct Answer: 1). Sampling rate $\times$ bits per sample

Explanation:

PCM bit rate equals number of samples per second multiplied by bits per sample.

Ref: Digital Communications – Sanjay Sharma

97. If sampling frequency is 8 kHz and 8 bits per sample, bit rate is

- 1). 16 kbps
- 2). 32 kbps
- 3). 64 kbps
- 4). 128 kbps

✓ Correct Answer: 3). 64 kbps

Explanation:

Bit rate = $8,000 \times 8 = 64,000$ bits/sec.

Ref: Digital Communications – Sanjay Sharma

98. PCM is widely used in

- 1). Television
- 2). Telephone systems
- 3). Radar
- 4). Satellite control

✓ Correct Answer: 2). Telephone systems

Explanation:

Digital telephony commonly uses PCM encoding.

Ref: Digital and Analog Communication Systems – K. Sam Shanmugam

99. In delta modulation step size should be

- 1). Very small
- 2). Very large
- 3). Properly selected
- 4). Zero

☒ Correct Answer: 3). Properly selected

Explanation:

Improper step size causes slope overload or granular noise.

Ref: Digital Communications – Sanjay Sharma

100. Granular noise occurs in delta modulation when

- 1). Step size too large
- 2). Step size too small
- 3). Carrier frequency high
- 4). Bandwidth low

☒ Correct Answer: 2). Step size too small

Explanation:

Small step size causes random oscillations around signal.

Ref: Digital Communications – Sanjay Sharma

101. ASK is sensitive to

- 1). Phase noise
- 2). Frequency noise
- 3). Amplitude noise
- 4). Thermal noise only

☒ Correct Answer: 3). Amplitude noise

Explanation:

Since amplitude represents data, noise affects detection.

Ref: Digital Communications – Sanjay Sharma

102. FSK has advantage over ASK because

- 1). Less bandwidth
- 2). Better noise immunity
- 3). Higher power
- 4). Lower frequency

✓ Correct Answer: 2). Better noise immunity

Explanation:

Frequency variation less affected by amplitude noise.

Ref: Digital Communications – Sanjay Sharma

103. PSK is more power efficient than

- 1). ASK
- 2). FM
- 3). PCM
- 4). AM

✓ Correct Answer: 1). ASK

Explanation:

Phase modulation requires less power for same error performance.

Ref: Principles of Digital Communication – J. Das, S.K. Tyagi and M.C. Mallick

104. In QAM information is transmitted using

- 1). Frequency only
- 2). Amplitude only
- 3). Phase only
- 4). Amplitude and phase

✓ Correct Answer: 4). Amplitude and phase

Explanation:

QAM combines amplitude and phase modulation.

Ref: Digital Communications – Sanjay Sharma

105. Multiplexing allows

- 1). Single signal transmission
- 2). Multiple signals over one channel
- 3). Noise reduction
- 4). Signal amplification

✓ Correct Answer: 2). Multiple signals over one channel

Explanation:

Multiplexing increases channel utilization.

Ref: Communication Systems – Simon Haykin

106. In FDM each signal occupies

- 1). Same frequency band
- 2). Separate frequency band
- 3). Same time slot
- 4). Same amplitude

✓ Correct Answer: 2). Separate frequency band

Explanation:

FDM allocates distinct frequency bands.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

107. TDM requires

- 1). Synchronization
- 2). Amplification
- 3). Detection
- 4). Modulation

✓ Correct Answer: 1). Synchronization

Explanation:

Timing synchronization ensures proper separation of signals.

Ref: Digital Communications – Sanjay Sharma

108. TDMA is used in

- 1). Analog systems
- 2). Digital cellular systems
- 3). Audio systems
- 4). Radar systems

✓ Correct Answer: 2). Digital cellular systems

Explanation:

TDMA allows multiple users to share same channel.

Ref: Digital Communications – Sanjay Sharma

109. Satellite communication mainly uses

- 1). Ground wave
- 2). Sky wave
- 3). Space wave
- 4). Surface wave

✓ Correct Answer: 3). Space wave

Explanation:

Signals travel directly between satellite and ground station.

Ref: Antennas and Wave Propagation – K.D. Prasad

110. Microwave communication also uses

- 1). Ground waves
- 2). Sky waves
- 3). Space waves
- 4). Surface waves

✓ Correct Answer: 3). Space waves

Explanation:

Microwave links require line-of-sight propagation.

Ref: Antennas and Wave Propagation – John D. Kraus

111. The Carson's rule for estimating FM bandwidth is

- 1). $BW = f_m$
- 2). $BW = 2f_m$
- 3). $BW = 2(\Delta f + f_m)$
- 4). $BW = \Delta f$

✓ Correct Answer: 3). $BW = 2(\Delta f + f_m)$

Explanation:

Carson's rule provides approximate bandwidth of FM signals considering frequency deviation and modulating frequency.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

112. If frequency deviation in FM is 75 kHz and modulating frequency is 15 kHz, bandwidth is

- 1). 90 kHz
- 2). 120 kHz
- 3). 180 kHz
- 4). 150 kHz

✓ Correct Answer: 3). 180 kHz

Explanation:

$$BW = 2(\Delta f + f_m) = 2(75 + 15) = 180 \text{ kHz.}$$

Ref: Principles of Communication Systems – Taub and Schilling

113. The frequency band used for FM broadcasting is

- 1). 530–1710 kHz
- 2). 88–108 MHz
- 3). 300–3000 Hz
- 4). 30–300 kHz

✓ Correct Answer: 2). 88–108 MHz

Explanation:

FM broadcasting operates in the VHF band.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

114. The IF used in FM receivers is

- 1). 455 kHz
- 2). 10.7 MHz
- 3). 1 MHz
- 4). 100 kHz

☒ Correct Answer: 2). 10.7 MHz

Explanation:

Higher IF improves selectivity and image rejection in FM receivers.

Ref: Communication Systems – Simon Haykin

115. The IF used in AM receivers is

- 1). 10.7 MHz
- 2). 455 kHz
- 3). 1 MHz
- 4). 200 kHz

☒ Correct Answer: 2). 455 kHz

Explanation:

455 kHz is chosen for good selectivity and stability.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

116. The block that removes unwanted frequencies in receiver is

- 1). Mixer
- 2). Detector
- 3). RF amplifier
- 4). Filter

☒ Correct Answer: 4). Filter

Explanation:

Filters select the desired signal and reject others.

Ref: Communication Systems – Simon Haykin

117. The purpose of RF amplifier in receiver is

- 1). Increase audio signal
- 2). Amplify received RF signal
- 3). Generate IF signal
- 4). Demodulate signal

☒ Correct Answer: 2). Amplify received RF signal

Explanation:

RF amplifier improves receiver sensitivity.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

118. In superheterodyne receiver the IF stage provides

- 1). Demodulation
- 2). Major amplification
- 3). Oscillation
- 4). Modulation

☒ Correct Answer: 2). Major amplification

Explanation:

Most amplification occurs at fixed IF frequency.

Ref: Communication Systems – Simon Haykin

119. The process of recovering modulating signal is called

- 1). Modulation
- 2). Detection
- 3). Amplification
- 4). Multiplexing

☒ Correct Answer: 2). Detection

Explanation:

Detection extracts original message signal.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

120. The process of separating combined multiplexed signals is

- 1). Multiplexing
- 2). Demultiplexing
- 3). Detection
- 4). Modulation

✓ Correct Answer: 2). Demultiplexing

Explanation:

Demultiplexer separates individual signals.

Ref: Digital Communications – Sanjay Sharma

121. In PCM quantization levels depend on

- 1). Sampling frequency
- 2). Number of bits
- 3). Carrier frequency
- 4). Bandwidth

✓ Correct Answer: 2). Number of bits

Explanation:

Number of quantization levels = 2^n .

Ref: Digital Communications – Sanjay Sharma

122. If PCM uses 8 bits per sample, quantization levels are

- 1). 64
- 2). 128
- 3). 256
- 4). 512

✓ Correct Answer: 3). 256

Explanation:

Levels = $2^8 = 256$.

Ref: Digital Communications – Sanjay Sharma

123. Sampling theorem states

- 1). $f_s \geq f_m$
- 2). $f_s \geq 2f_m$
- 3). $f_s = f_m$
- 4). $f_s = 3f_m$

✓ Correct Answer: 2). $f_s \geq 2f_m$

Explanation:

Sampling frequency must be at least twice the highest signal frequency.

Ref: Principles of Digital Communication – J. Das, S.K. Tyagi and M.C. Mallick

124. The Nyquist rate is

- 1). Maximum frequency
- 2). Twice the maximum frequency
- 3). Half the frequency
- 4). Equal to carrier frequency

✓ Correct Answer: 2). Twice the maximum frequency

Explanation:

Minimum sampling rate to avoid aliasing.

Ref: Digital Communications – Sanjay Sharma

125. In ASK modulation binary 1 is represented by

- 1). Zero amplitude
- 2). Carrier amplitude present
- 3). Frequency change
- 4). Phase change

✓ Correct Answer: 2). Carrier amplitude present

Explanation:

Carrier amplitude corresponds to logic 1.

Ref: Digital Communications – Sanjay Sharma

126. In binary FSK

- 1). Two amplitudes used
- 2). Two frequencies used
- 3). Two phases used
- 4). Two time slots used

✓ Correct Answer: 2). Two frequencies used

Explanation:

Binary data represented by two distinct frequencies.

Ref: Digital Communications – Sanjay Sharma

127. In BPSK

- 1). Two amplitudes used
- 2). Two frequencies used
- 3). Two phases used
- 4). Two time slots used

✓ Correct Answer: 3). Two phases used

Explanation:

Phase shifts of 0° and 180° represent binary data.

Ref: Digital Communications – Sanjay Sharma

128. QAM is widely used in

- 1). Television broadcasting
- 2). Satellite communication
- 3). Digital modems
- 4). Radar

✓ Correct Answer: 3). Digital modems

Explanation:

QAM enables high data rates in modems.

Ref: Digital Communications – Sanjay Sharma

129. The advantage of digital communication over analog is

- 1). Higher noise sensitivity
- 2). Better noise immunity
- 3). Lower bandwidth
- 4). Lower reliability

✓ Correct Answer: 2). Better noise immunity

Explanation:

Digital signals are less affected by noise.

Ref: Digital and Analog Communication Systems – K. Sam Shanmugam

130. Error detection technique commonly used in data transmission is

- 1). Parity check
- 2). AM modulation
- 3). FM modulation
- 4). Phase modulation

✓ Correct Answer: 1). Parity check

Explanation:

Parity bit helps detect errors in data transmission.

Ref: Digital Communications – Sanjay Sharma

131. Hamming code is used for

- 1). Error detection only
- 2). Error correction
- 3). Amplification
- 4). Modulation

✓ Correct Answer: 2). Error correction

Explanation:

Hamming code detects and corrects single-bit errors.

Ref: Digital Communications – Sanjay Sharma

132. In FDM guard bands are used to

- 1). Increase bandwidth
- 2). Prevent overlap between channels
- 3). Increase noise
- 4). Increase amplitude

✓ Correct Answer: 2). Prevent overlap between channels

Explanation:

Guard bands separate adjacent frequency channels.

Ref: Communication Systems – Simon Haykin

133. In TDM signals are separated by

- 1). Frequency
- 2). Time
- 3). Phase
- 4). Amplitude

✓ Correct Answer: 2). Time

Explanation:

Each signal assigned unique time slot.

Ref: Digital Communications – Sanjay Sharma

134. TDMA allows

- 1). Single user access
- 2). Multiple users sharing time slots
- 3). Multiple frequencies
- 4). Multiple amplitudes

✓ Correct Answer: 2). Multiple users sharing time slots

Explanation:

Each user transmits during assigned time slot.

Ref: Digital Communications – Sanjay Sharma

135. Ground wave propagation mainly occurs in

- 1). VHF band
- 2). LF and MF bands
- 3). UHF band
- 4). Microwave band

☒ Correct Answer: 2). LF and MF bands

Explanation:

Low and medium frequencies follow earth surface.

Ref: Antennas and Wave Propagation – K.D. Prasad

136. Sky wave propagation uses reflection from

- 1). Troposphere
- 2). Ionosphere
- 3). Stratosphere
- 4). Mesosphere

☒ Correct Answer: 2). Ionosphere

Explanation:

Ionosphere reflects radio waves enabling long distance communication.

Ref: Antennas and Wave Propagation – John D. Kraus

137. Space wave communication requires

- 1). Reflection from ionosphere
- 2). Line of sight path
- 3). Ground reflection
- 4). Ocean reflection

☒ Correct Answer: 2). Line of sight path

Explanation:

Used in microwave and satellite links.

Ref: Antennas and Wave Propagation – K.D. Prasad

138. Satellite communication mainly uses

- 1). Ground waves
- 2). Sky waves
- 3). Space waves
- 4). Surface waves

☒ Correct Answer: 3). Space waves

Explanation:

Signals travel directly between satellite and earth stations.

Ref: Antennas and Wave Propagation – John D. Kraus

139. Microwave communication uses

- 1). Ground wave
- 2). Sky wave
- 3). Space wave
- 4). Surface wave

☒ Correct Answer: 3). Space wave

Explanation:

Microwaves propagate in straight line.

Ref: Antennas and Wave Propagation – K.D. Prasad

140. The main advantage of multiplexing is

- 1). Reduces power
- 2). Efficient use of channel bandwidth
- 3). Reduces noise
- 4). Increases distortion

☒ Correct Answer: 2). Efficient use of channel bandwidth

Explanation:

Multiplexing allows multiple signals over one channel.

Ref: Communication Systems – Simon Haykin

141. PCM requires

- 1). Modulator only
- 2). Sampler, quantizer, encoder
- 3). Amplifier only
- 4). Oscillator only

✓ Correct Answer: 2). Sampler, quantizer, encoder

Explanation:

These blocks convert analog signals into digital format.

Ref: Digital Communications – Sanjay Sharma

142. Delta modulation uses

- 1). Comparator and integrator
- 2). Oscillator
- 3). Mixer
- 4). Detector

✓ Correct Answer: 1). Comparator and integrator

Explanation:

Comparator compares input and predicted signal.

Ref: Digital Communications – Sanjay Sharma

143. In digital communication bandwidth requirement is

- 1). Low
- 2). High
- 3). Zero
- 4). Constant

✓ Correct Answer: 2). High

Explanation:

Digital signals require wider bandwidth.

Ref: Digital and Analog Communication Systems – K. Sam Shanmugam

144. Binary data transmission rate is measured in

- 1). Hertz
- 2). Bits per second
- 3). Watts
- 4). Volts

✓ Correct Answer: 2). Bits per second

Explanation:

bps indicates number of bits transmitted per second.

Ref: Digital Communications – Sanjay Sharma

145. Symbol rate is also called

- 1). Baud rate
- 2). Bit rate
- 3). Carrier rate
- 4). Signal rate

✓ Correct Answer: 1). Baud rate

Explanation:

Baud rate indicates number of symbols transmitted per second.

Ref: Digital Communications – Sanjay Sharma

146. In QAM two carriers are

- 1). In phase
- 2). 90° phase shifted
- 3). 180° phase shifted
- 4). 45° phase shifted

✓ Correct Answer: 2). 90° phase shifted

Explanation:

Quadrature carriers allow simultaneous amplitude modulation.

Ref: Digital Communications – Sanjay Sharma

147. In synchronous transmission data is sent

- 1). Character by character
- 2). Frame by frame
- 3). Bit by bit randomly
- 4). Without clock

✓ Correct Answer: 2). Frame by frame

Explanation:

Data transmitted in blocks using common clock.

Ref: Digital Communications – Sanjay Sharma

148. Asynchronous transmission is used in

- 1). Serial communication
- 2). Satellite communication
- 3). Microwave links
- 4). Radar

✓ Correct Answer: 1). Serial communication

Explanation:

Used in UART communication systems.

Ref: Digital Communications – Sanjay Sharma

149. Error control coding improves

- 1). Noise generation
- 2). Data reliability
- 3). Carrier frequency
- 4). Modulation index

✓ Correct Answer: 2). Data reliability

Explanation:

Error control codes ensure correct data reception.

Ref: Digital Communications – Sanjay Sharma

150. The primary objective of communication system is

- 1). Generate signals
- 2). Transmit information accurately
- 3). Amplify signals
- 4). Reduce frequency

☒ Correct Answer: 2). Transmit information accurately

Explanation:

Communication systems aim to transfer information efficiently and reliably.

Ref: Electronic Communication Systems – George Kennedy and Bernard Davis

UNIT 6. ADVANCED COMMUNICATION SYSTEMS

1. Radiation resistance of an antenna represents

- 1). Power radiated by antenna
- 2). Loss resistance
- 3). Equivalent resistance that radiates power
- 4). Input impedance

✓ Correct Answer: 3). Equivalent resistance that radiates power

Explanation:

Radiation resistance represents the portion of antenna resistance responsible for radiation of electromagnetic waves.

Ref: Antennas and Wave Propagation – John D. Kraus and Ronald J. Marhefka

2. Beam width of an antenna is defined as

- 1). Width of antenna element
- 2). Angle between half power points
- 3). Angle between main lobes
- 4). Width of radiation pattern

✓ Correct Answer: 2). Angle between half power points

Explanation:

Beam width is the angular separation between half-power points in the radiation pattern.

Ref: Antennas and Wave Propagation – K.D. Prasad

3. Polarization of an antenna refers to

- 1). Direction of signal propagation
- 2). Orientation of electric field vector
- 3). Magnetic field strength
- 4). Radiation resistance

✓ Correct Answer: 2). Orientation of electric field vector

Explanation:

Polarization indicates the direction of the electric field in the radiated wave.

Ref: Antenna Theory – Constantine A. Balanis

4. Directivity of an antenna indicates

- 1). Power loss
- 2). Directional concentration of radiation
- 3). Frequency response
- 4). Input impedance

✓ Correct Answer: 2). Directional concentration of radiation

Explanation:

Directivity measures how focused the radiation pattern is in a particular direction.

Ref: Antennas and Wave Propagation – John D. Kraus and Ronald J. Marhefka

5. Antenna efficiency is defined as

- 1). Radiated power / input power
- 2). Input power / radiated power
- 3). Output voltage / input voltage
- 4). Gain / bandwidth

✓ Correct Answer: 1). Radiated power / input power

Explanation:

Efficiency represents fraction of input power actually radiated.

Ref: Antennas and Wave Propagation – K.D. Prasad

6. Antenna gain combines

- 1). Directivity and efficiency
- 2). Bandwidth and power
- 3). Radiation resistance and reactance
- 4). Frequency and wavelength

✓ Correct Answer: 1). Directivity and efficiency

Explanation:

Gain accounts for both directional radiation and antenna losses.

Ref: Antenna Theory – Constantine A. Balanis

7. Front-to-back ratio represents

- 1). Ratio of front radiation to back radiation
- 2). Ratio of antenna length to width
- 3). Ratio of input to output power
- 4). Ratio of gain to efficiency

☒ Correct Answer: 1). Ratio of front radiation to back radiation

Explanation:

Indicates directional performance of antenna.

Ref: Antennas and Wave Propagation – John D. Kraus and Ronald J. Marhefka

8. A folded dipole antenna has

- 1). Lower impedance than dipole
- 2). Higher impedance than dipole
- 3). Same impedance as dipole
- 4). Zero impedance

☒ Correct Answer: 2). Higher impedance than dipole

Explanation:

Folded dipole impedance is approximately four times that of simple dipole.

Ref: Antennas and Wave Propagation – K.D. Prasad

9. Broadside array radiates maximum energy

- 1). Along axis of array
- 2). Perpendicular to array axis
- 3). Random direction
- 4). Toward ground

☒ Correct Answer: 2). Perpendicular to array axis

Explanation:

Broadside arrays produce radiation normal to the antenna line.

Ref: Antenna Theory – Constantine A. Balanis

10. End-fire array radiates maximum energy

- 1). Along axis of array
- 2). Perpendicular to axis
- 3). Random direction
- 4). Toward ground

☒ Correct Answer: 1). Along axis of array

Explanation:

End-fire arrays radiate along the direction of antenna elements.

Ref: Antennas and Wave Propagation – K.D. Prasad

11. Yagi-Uda antenna is mainly used for

- 1). Television reception
- 2). Radar
- 3). Satellite communication
- 4). Microwave heating

☒ Correct Answer: 1). Television reception

Explanation:

Yagi antenna provides high gain for TV reception.

Ref: Antennas and Wave Propagation – John D. Kraus and Ronald J. Marhefka

12. A Yagi antenna consists of

- 1). Driven element only
- 2). Driven element, reflector and directors
- 3). Reflector only
- 4). Directors only

☒ Correct Answer: 2). Driven element, reflector and directors

Explanation:

These elements improve antenna gain and directivity.

Ref: Antennas and Wave Propagation – K.D. Prasad

13. Log periodic antenna is known for

- 1). Narrow bandwidth
- 2). Wide bandwidth
- 3). Low gain
- 4). Low efficiency

☒ Correct Answer: 2). Wide bandwidth

Explanation:

Log periodic antennas operate over wide frequency range.

Ref: Antenna Theory – Constantine A. Balanis

14. Parabolic reflector antennas are used in

- 1). Satellite communication
- 2). Audio systems
- 3). Power electronics
- 4). Television amplifiers

☒ Correct Answer: 1). Satellite communication

Explanation:

Parabolic reflectors provide very high gain.

Ref: Antennas and Wave Propagation – John D. Kraus and Ronald J. Marhefka

15. Gain of parabolic reflector increases with

- 1). Decreasing diameter
- 2). Increasing diameter
- 3). Decreasing frequency
- 4). Increasing wavelength

☒ Correct Answer: 2). Increasing diameter

Explanation:

Larger dish provides higher gain.

Ref: Antennas and Wave Propagation – K.D. Prasad

16. Waveguides are used to transmit

- 1). Low frequency signals
- 2). Microwave signals
- 3). Audio signals
- 4). DC signals

☒ Correct Answer: 2). Microwave signals

Explanation:

Waveguides efficiently guide microwave energy.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

17. The most common waveguide shape is

- 1). Circular
- 2). Rectangular
- 3). Square
- 4). Triangular

☒ Correct Answer: 2). Rectangular

Explanation:

Rectangular waveguides are widely used due to simple design.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

18. Dominant mode in rectangular waveguide is

- 1). TE₁₀
- 2). TE₁₁
- 3). TM₁₁
- 4). TEM

☒ Correct Answer: 1). TE₁₀

Explanation:

TE₁₀ has lowest cutoff frequency.

Ref: Microwave and Radar Engineering – M. Kulkarni

19. Cutoff wavelength of waveguide is

- 1). Maximum wavelength that can propagate
- 2). Minimum wavelength
- 3). Average wavelength
- 4). Infinite wavelength

☒ Correct Answer: 1). Maximum wavelength that can propagate

Explanation:

Signals with wavelength larger than cutoff cannot propagate.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

20. Phase velocity in waveguide is

- 1). Less than speed of light
- 2). Equal to speed of light
- 3). Greater than speed of light
- 4). Zero

☒ Correct Answer: 3). Greater than speed of light

Explanation:

Phase velocity exceeds speed of light but does not violate relativity.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

21. Group velocity represents

- 1). Speed of energy transmission
- 2). Speed of electrons
- 3). Speed of photons
- 4). Speed of modulation

✓ Correct Answer: 1). Speed of energy transmission

Explanation:

Group velocity indicates speed of signal energy.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

22. Magnetron operates on

- 1). Velocity modulation
- 2). Cross-field interaction
- 3). Amplitude modulation
- 4). Phase modulation

✓ Correct Answer: 2). Cross-field interaction

Explanation:

Magnetron uses perpendicular electric and magnetic fields.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

23. Klystron amplifier operates on

- 1). Cross-field effect
- 2). Velocity modulation
- 3). Phase modulation
- 4). Frequency modulation

✓ Correct Answer: 2). Velocity modulation

Explanation:

Electron beam velocity is modulated to amplify microwave signals.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

24. TWT stands for

- 1). Traveling Wave Tube
- 2). Transverse Wave Tube
- 3). Thermal Wave Tube
- 4). Time Wave Tube

✓ Correct Answer: 1). Traveling Wave Tube

Explanation:

TWT amplifies microwave signals over wide bandwidth.

Ref: Microwave and Radar Engineering – M. Kulkarni

25. Radar stands for

- 1). Radio Detection and Ranging
- 2). Radio Data and Response
- 3). Radar Detection and Analysis
- 4). Radio Distance and Range

☒ Correct Answer: 1). Radio Detection and Ranging

Explanation:

Radar detects objects and determines distance.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

26. Radar range equation determines

- 1). Maximum detection range
- 2). Signal frequency
- 3). Antenna impedance
- 4). Wave velocity

☒ Correct Answer: 1). Maximum detection range

Explanation:

Radar range equation calculates distance at which target can be detected.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

27. Duplexer in radar allows

- 1). Simultaneous transmission and reception using same antenna
- 2). Separate antennas
- 3). Higher power transmission
- 4). Frequency conversion

✓ Correct Answer: 1). Simultaneous transmission and reception using same antenna

Explanation:

Duplexer switches antenna between transmitter and receiver.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

28. Pulsed radar measures range using

- 1). Signal frequency
- 2). Time delay of echo
- 3). Signal amplitude
- 4). Phase shift

✓ Correct Answer: 2). Time delay of echo

Explanation:

Distance determined from round trip travel time.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

29. CW radar measures

- 1). Range
- 2). Velocity
- 3). Frequency
- 4). Phase

✓ Correct Answer: 2). Velocity

Explanation:

Continuous wave radar uses Doppler effect.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

30. MTI radar is used for

- 1). Detect stationary targets
- 2). Detect moving targets
- 3). Detect frequency
- 4). Detect phase

✓ Correct Answer: 2). Detect moving targets

Explanation:

MTI radar eliminates stationary clutter.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

41. The main function of a satellite in communication is

- 1). Generate signals
- 2). Amplify and retransmit signals
- 3). Detect signals
- 4). Store signals

✓ Correct Answer: 2). Amplify and retransmit signals

Explanation:

Communication satellites receive signals from earth, amplify them and retransmit back.

Ref: Satellite Communications – Dennis Roddy

42. The frequency used for uplink in satellite communication is usually

- 1). Lower than downlink frequency
- 2). Higher than downlink frequency
- 3). Equal to downlink frequency
- 4). Zero frequency

✓ Correct Answer: 2). Higher than downlink frequency

Explanation:

Higher uplink frequency reduces interference between uplink and downlink.

Ref: Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt

43. Downlink frequency is

- 1). Higher than uplink frequency
- 2). Lower than uplink frequency
- 3). Equal to uplink frequency
- 4). Random

✓ Correct Answer: 2). Lower than uplink frequency

Explanation:

Lower frequency reduces atmospheric attenuation during reception.

Ref: Satellite Communications – Dennis Roddy

44. A satellite that remains fixed relative to earth is called

- 1). Polar satellite
- 2). Geostationary satellite
- 3). Elliptical satellite
- 4). LEO satellite

✓ Correct Answer: 2). Geostationary satellite

Explanation:

Geostationary satellites orbit earth in 24 hours at equatorial plane.

Ref: Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt

45. The altitude of geostationary satellite is approximately

- 1). 360 km
- 2). 3600 km
- 3). 36,000 km
- 4). 360,000 km

✓ Correct Answer: 3). 36,000 km

Explanation:

Geostationary orbit is about 35,786 km above earth.

Ref: Satellite Communications – Dennis Roddy

46. Satellite onboard equipment includes

- 1). Antenna and transponder
- 2). Only antenna
- 3). Only transmitter
- 4). Only receiver

✓ Correct Answer: 1). Antenna and transponder

Explanation:

Transponder receives, amplifies and retransmits signals.

Ref: Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt

47. The earth station is used to

- 1). Launch satellites
- 2). Communicate with satellites
- 3). Detect radar signals
- 4). Generate microwaves

✓ Correct Answer: 2). Communicate with satellites

Explanation:

Earth stations transmit and receive signals to satellites.

Ref: Satellite Communications – Dennis Roddy

48. A satellite transponder acts like

- 1). Amplifier
- 2). Repeater
- 3). Modulator
- 4). Oscillator

✓ Correct Answer: 2). Repeater

Explanation:

It receives signal, amplifies and retransmits it.

Ref: Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt

49. Fiber optic communication uses

- 1). Electrical signals
- 2). Light signals
- 3). Radio waves
- 4). Microwave signals

✓ Correct Answer: 2). Light signals

Explanation:

Optical fiber transmits information using light pulses.

Ref: Optical Fiber Communications – Gerd Keiser

50. Optical fiber works on

- 1). Reflection
- 2). Total internal reflection
- 3). Diffraction
- 4). Refraction only

✓ Correct Answer: 2). Total internal reflection

Explanation:

Light propagates inside fiber through total internal reflection.

Ref: Optical Fiber Communications – Gerd Keiser

51. Optical fiber core is surrounded by

- 1). Insulation
- 2). Cladding
- 3). Sheath
- 4). Shield

✓ Correct Answer: 2). Cladding

Explanation:

Cladding has lower refractive index than core.

Ref: Optical Fiber Communications – John M. Senior

52. Optical fibers are mainly classified as

- 1). Single mode and multimode
- 2). Analog and digital
- 3). Coaxial and twisted pair
- 4). Metallic and non-metallic

✓ Correct Answer: 1). Single mode and multimode

Explanation:

Classification based on number of light propagation paths.

Ref: Optical Fiber Communications – Gerd Keiser

53. Single mode fiber is used for

- 1). Short distance communication
- 2). Long distance communication
- 3). Local networks
- 4). Audio systems

✓ Correct Answer: 2). Long distance communication

Explanation:

Single mode fibers have low dispersion.

Ref: Optical Fiber Communications – John M. Senior

54. Optical connectors are used to

- 1). Amplify light
- 2). Join fibers temporarily
- 3). Generate light
- 4). Detect light

✓ Correct Answer: 2). Join fibers temporarily

Explanation:

Connectors allow removable fiber connections.

Ref: Optical Fiber Communications – Gerd Keiser

55. Splicing of optical fibers means

- 1). Permanent joining of fibers
- 2). Temporary joining
- 3). Amplifying signal
- 4). Detecting signal

✓ Correct Answer: 1). Permanent joining of fibers

Explanation:

Splicing creates permanent optical fiber joints.

Ref: Optical Fiber Communications – John M. Senior

56. Optical emitters include

- 1). LED and laser diode
- 2). Photodiode and transistor
- 3). Thermistor and LDR
- 4). SCR and TRIAC

✓ Correct Answer: 1). LED and laser diode

Explanation:

These devices convert electrical signals into light.

Ref: Optical Fiber Communications – Gerd Keiser

57. Optical detectors include

- 1). Photodiode
- 2). Laser diode
- 3). LED
- 4). Oscillator

✓ Correct Answer: 1). Photodiode

Explanation:

Photodiodes convert light signals into electrical signals.

Ref: Optical Fiber Communications – John M. Senior

58. Optical repeaters are used to

- 1). Amplify electrical signals
- 2). Regenerate optical signals
- 3). Detect signals
- 4). Filter signals

✓ Correct Answer: 2). Regenerate optical signals

Explanation:

Repeaters extend communication distance.

Ref: Optical Fiber Communications – Gerd Keiser

59. WDM stands for

- 1). Wave Division Multiplexing
- 2). Wavelength Division Multiplexing
- 3). Wide Division Modulation
- 4). Wave Data Multiplexing

✓ Correct Answer: 2). Wavelength Division Multiplexing

Explanation:

Multiple wavelengths transmitted through same fiber.

Ref: Optical Fiber Communications – Gerd Keiser

60. WDM increases

- 1). Signal attenuation
- 2). Channel capacity
- 3). Noise
- 4). Signal distortion

✓ Correct Answer: 2). Channel capacity

Explanation:

Different wavelengths carry separate channels.

Ref: Optical Fiber Communications – John M. Senior

61. Cellular communication divides area into

- 1). Zones
- 2). Cells
- 3). Regions
- 4). Blocks

✓ Correct Answer: 2). Cells

Explanation:

Cellular concept improves frequency reuse.

Ref: Wireless Communications – Theodore S. Rappaport

62. Frequency reuse improves

- 1). Signal distortion
- 2). System capacity
- 3). Power loss
- 4). Noise

✓ Correct Answer: 2). System capacity

Explanation:

Same frequencies reused in different cells.

Ref: Mobile Cellular Telecommunications – William C.Y. Lee

63. Handoff in cellular communication means

- 1). Signal amplification
- 2). Transfer of call between cells
- 3). Frequency conversion
- 4). Power reduction

✓ Correct Answer: 2). Transfer of call between cells

Explanation:

Maintains call continuity during movement.

Ref: Wireless Communications – Theodore S. Rappaport

64. AMPS system uses

- 1). FDMA
- 2). TDMA
- 3). CDMA
- 4). OFDM

✓ Correct Answer: 1). FDMA

Explanation:

AMPS uses frequency division multiple access.

Ref: Mobile Cellular Telecommunications – William C.Y. Lee

65. GSM system uses

- 1). TDMA
- 2). FDMA
- 3). CDMA
- 4). OFDM

☒ Correct Answer: 1). TDMA

Explanation:

GSM uses time division multiple access.

Ref: Wireless Communications – Theodore S. Rappaport

66. CDMA stands for

- 1). Code Division Multiple Access
- 2). Carrier Division Multiple Access
- 3). Code Digital Modulation Access
- 4). Carrier Digital Multiple Access

☒ Correct Answer: 1). Code Division Multiple Access

Explanation:

Users share same frequency band using unique codes.

Ref: Wireless Communications – Theodore S. Rappaport

67. CDMA advantage is

- 1). Low capacity
- 2). High capacity
- 3). High interference
- 4). Low reliability

✓ Correct Answer: 2). High capacity

Explanation:

Spread spectrum allows many users simultaneously.

Ref: Mobile Cellular Telecommunications – William C.Y. Lee

68. Cellular communication mainly uses

- 1). Ground waves
- 2). Sky waves
- 3). Space waves
- 4). Surface waves

✓ Correct Answer: 3). Space waves

Explanation:

Signals travel directly between base station and mobile.

Ref: Wireless Communications – Theodore S. Rappaport

69. Radar indicators include

- 1). A-scope
- 2). PPI scope
- 3). B-scope
- 4). All of the above

✓ Correct Answer: 4). All of the above

Explanation:

Different radar displays provide range and position information.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

70. Radar range depends on

- 1). Transmitted power
- 2). Antenna gain
- 3). Target cross section
- 4). All of the above

✓ Correct Answer: 4). All of the above

Explanation:

Radar range equation includes these parameters.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

71. The radar range equation determines

- 1). Target velocity
- 2). Maximum detection range
- 3). Antenna impedance
- 4). Signal bandwidth

✓ Correct Answer: 2). Maximum detection range

Explanation:

Radar range equation relates transmitted power, antenna gain, wavelength and target cross-section to determine maximum detectable distance.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

72. In pulsed radar, range of a target is determined by

- 1). Frequency of signal
- 2). Amplitude of signal
- 3). Time delay between transmitted and received pulse
- 4). Phase of signal

✓ Correct Answer: 3). Time delay between transmitted and received pulse

Explanation:

Distance is calculated using the round-trip time of the reflected pulse.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

73. Radar range is given by

- 1). $R = c / f$
- 2). $R = ct$

3). $R = ct / 2$

4). $R = t / c$

✓ Correct Answer: 3). $R = ct / 2$

Explanation:

Radar signal travels to the target and back, so distance is half the product of speed of light and time delay.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

74. Duplexer in radar is used to

- 1). Amplify signal
- 2). Protect receiver during transmission
- 3). Increase antenna gain
- 4). Detect signal

✓ Correct Answer: 2). Protect receiver during transmission

Explanation:

Duplexer switches antenna between transmitter and receiver.

Ref: Microwave and Radar Engineering – M. Kulkarni

75. Continuous wave radar measures

- 1). Range only
- 2). Velocity only
- 3). Power
- 4). Frequency

✓ Correct Answer: 2). Velocity only

Explanation:

CW radar uses Doppler shift to measure target velocity.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

76. MTI radar is used to

- 1). Detect stationary objects
- 2). Detect moving targets in clutter

- 3). Measure distance
- 4). Detect signal frequency

✓ Correct Answer: 2). Detect moving targets in clutter

Explanation:

Moving Target Indicator radar suppresses reflections from stationary objects.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

77. In a rectangular waveguide, the cutoff frequency depends on

- 1). Waveguide dimensions
- 2). Signal amplitude
- 3). Antenna gain
- 4). Transmitter power

✓ Correct Answer: 1). Waveguide dimensions

Explanation:

Cutoff frequency determined by physical dimensions of waveguide.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

78. If wavelength is greater than cutoff wavelength

- 1). Signal propagates normally
- 2). Signal attenuates rapidly
- 3). Signal amplifies
- 4). Signal oscillates

✓ Correct Answer: 2). Signal attenuates rapidly

Explanation:

Propagation is not possible when wavelength exceeds cutoff value.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

79. Waveguide transmission is mainly used in

- 1). Audio systems
- 2). Microwave communication
- 3). Low frequency systems
- 4). DC systems

☒ Correct Answer: 2). Microwave communication

Explanation:

Waveguides efficiently carry microwave signals.

Ref: Microwave and Radar Engineering – M. Kulkarni

80. In a parabolic reflector antenna, the feed is placed at

- 1). Center
- 2). Focus
- 3). Edge
- 4). Random point

☒ Correct Answer: 2). Focus

Explanation:

Feed antenna at focus reflects waves into parallel beam.

Ref: Antennas and Wave Propagation – John D. Kraus and Ronald J. Marhefka

81. Beam width of antenna decreases when

- 1). Antenna size decreases
- 2). Antenna size increases
- 3). Frequency decreases
- 4). Power decreases

☒ Correct Answer: 2). Antenna size increases

Explanation:

Larger antennas produce narrower beams.

Ref: Antennas and Wave Propagation – K.D. Prasad

82. Antenna gain increases when

- 1). Beam width increases
- 2). Beam width decreases
- 3). Frequency decreases
- 4). Power decreases

☒ Correct Answer: 2). Beam width decreases

Explanation:

Narrow beams concentrate power increasing gain.

Ref: Antenna Theory – Constantine A. Balanis

83. Optical fiber attenuation is mainly caused by

- 1). Reflection
- 2). Absorption and scattering
- 3). Amplification
- 4). Dispersion only

☒ Correct Answer: 2). Absorption and scattering

Explanation:

Material absorption and Rayleigh scattering cause signal loss.

Ref: Optical Fiber Communications – Gerd Keiser

84. Optical switches are used to

- 1). Amplify signals
- 2). Route optical signals
- 3). Detect signals
- 4). Generate signals

☒ Correct Answer: 2). Route optical signals

Explanation:

Switches direct signals between optical paths.

Ref: Optical Fiber Communications – John M. Senior

85. Optical couplers are used to

- 1). Combine optical signals
- 2). Detect signals
- 3). Amplify signals
- 4). Generate signals

☒ Correct Answer: 1). Combine optical signals

Explanation:

Couplers split or combine optical power.

Ref: Optical Fiber Communications – Gerd Keiser

86. Fiber optic communication offers

- 1). Low bandwidth
- 2). High bandwidth
- 3). High interference
- 4). High attenuation

☒ Correct Answer: 2). High bandwidth

Explanation:

Optical fibers support extremely high data rates.

Ref: Optical Fiber Communications – John M. Senior

87. Major advantage of fiber optics is

- 1). Immunity to electromagnetic interference
- 2). High noise
- 3). Low bandwidth
- 4). Low reliability

☒ Correct Answer: 1). Immunity to electromagnetic interference

Explanation:

Light signals are not affected by electromagnetic noise.

Ref: Optical Fiber Communications – Gerd Keiser

88. Cellular frequency reuse factor improves

- 1). Noise
- 2). Capacity
- 3). Attenuation
- 4). Delay

✓ Correct Answer: 2). Capacity

Explanation:

Reuse allows many users in different cells.

Ref: Wireless Communications – Theodore S. Rappaport

89. GSM system mainly uses

- 1). FDMA
- 2). TDMA
- 3). CDMA
- 4). OFDM

✓ Correct Answer: 2). TDMA

Explanation:

GSM divides channel into time slots.

Ref: Wireless Communications – Theodore S. Rappaport

90. CDMA system spreads signal using

- 1). Frequency division
- 2). Time division
- 3). Spread spectrum codes
- 4). Amplitude modulation

✓ Correct Answer: 3). Spread spectrum codes

Explanation:

Each user uses unique code sequence.

Ref: Mobile Cellular Telecommunications – William C.Y. Lee

91. AMPS cellular system uses

- 1). FDMA
- 2). TDMA
- 3). CDMA
- 4). OFDM

☒ Correct Answer: 1). FDMA

Explanation:

AMPS assigns different frequencies to users.

Ref: Mobile Cellular Telecommunications – William C.Y. Lee

92. Cellular communication improves

- 1). Power loss
- 2). Spectrum efficiency
- 3). Signal distortion
- 4). Noise

☒ Correct Answer: 2). Spectrum efficiency

Explanation:

Frequency reuse increases system efficiency.

Ref: Wireless Communications – Theodore S. Rappaport

93. Handoff occurs when

- 1). User moves between cells
- 2). Signal lost
- 3). Frequency changes
- 4). Antenna rotates

☒ Correct Answer: 1). User moves between cells

Explanation:

Connection transfers to next base station.

Ref: Wireless Communications – Theodore S. Rappaport

94. Satellite communication mainly uses frequency band

- 1). HF
- 2). VHF
- 3). SHF
- 4). LF

✓ Correct Answer: 3). SHF

Explanation:

Microwave frequencies used for satellite links.

Ref: Satellite Communications – Dennis Roddy

95. Satellite uplink frequency band is generally

- 1). Lower than downlink
- 2). Higher than downlink
- 3). Equal to downlink
- 4). Random

✓ Correct Answer: 2). Higher than downlink

Explanation:

Higher uplink frequency avoids interference.

Ref: Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt

96. The Doppler effect in radar measures

- 1). Distance
- 2). Velocity
- 3). Frequency
- 4). Phase

✓ Correct Answer: 2). Velocity

Explanation:

Frequency shift due to motion gives velocity.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

97. Satellite footprint represents

- 1). Satellite orbit
- 2). Coverage area on earth
- 3). Antenna gain
- 4). Signal power

✓ Correct Answer: 2). Coverage area on earth

Explanation:

Footprint indicates region served by satellite.

Ref: Satellite Communications – Dennis Roddy

98. Fiber optic repeater increases

- 1). Signal strength
- 2). Signal frequency
- 3). Signal wavelength
- 4). Signal phase

✓ Correct Answer: 1). Signal strength

Explanation:

Repeaters regenerate weakened signals.

Ref: Optical Fiber Communications – Gerd Keiser

99. Parabolic reflector antennas are widely used in

- 1). Microwave links
- 2). Audio systems
- 3). Power electronics
- 4). Digital logic

✓ Correct Answer: 1). Microwave links

Explanation:

High gain directional antennas for microwave communication.

Ref: Antennas and Wave Propagation – John D. Kraus and Ronald J. Marhefka

100. The main advantage of satellite communication is

- 1). Limited coverage
- 2). Global communication capability
- 3). High noise
- 4). Low bandwidth

 Correct Answer: 2). Global communication capability

Explanation:

Satellites provide communication over very large geographic areas.

Ref: Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt

UNIT 7. DIGITAL ELECTRONICS

1. The base of binary number system is

- 1). 2
- 2). 8
- 3). 10
- 4). 16

☒ Correct Answer: 1). 2

Explanation:

Binary system uses two symbols (0 and 1) and has base 2.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

2. The decimal equivalent of binary number $(1011)_2$ is

- 1). 9
- 2). 10
- 3). 11
- 4). 12

☒ Correct Answer: 3). 11

Explanation:

$$(1011)_2 = 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0 = 8 + 2 + 1 = 11.$$

Ref: Fundamentals of Digital Circuits – A. Anand Kumar

3. The hexadecimal equivalent of binary 1111 is

- 1). A
- 2). C
- 3). E
- 4). F

☒ Correct Answer: 4). F

Explanation:

Binary 1111 equals decimal 15 which corresponds to hexadecimal F.

Ref: Digital Fundamentals – Thomas L. Floyd

4. The logic gate that produces output 1 only when all inputs are 1 is

- 1). OR gate
- 2). AND gate
- 3). NAND gate
- 4). XOR gate

☒ Correct Answer: 2). AND gate

Explanation:

AND gate outputs logic 1 only if all inputs are 1.

Ref: Modern Digital Electronics – R.P. Jain

5. The OR gate output is 1 when

- 1). All inputs are 0
- 2). Any input is 1
- 3). All inputs are 1
- 4). No input is 1

☒ Correct Answer: 2). Any input is 1

Explanation:

OR gate outputs logic 1 if at least one input is high.

Ref: Digital Systems – Tocci, Widmer and Moss

6. NAND gate is called

- 1). Basic gate
- 2). Universal gate
- 3). Sequential gate
- 4). Linear gate

☒ Correct Answer: 2). Universal gate

Explanation:

NAND gate can implement any logic function.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

7. NOR gate is also called

- 1). Universal gate
- 2). Sequential gate
- 3). Linear gate
- 4). Buffer gate

✓ Correct Answer: 1). Universal gate

Explanation:

NOR gate can also realize all logic circuits.

Ref: Modern Digital Electronics – R.P. Jain

8. XOR gate outputs 1 when

- 1). Inputs are equal
- 2). Inputs are different
- 3). All inputs are 0
- 4). All inputs are 1

✓ Correct Answer: 2). Inputs are different

Explanation:

Exclusive OR gate produces output 1 for unequal inputs.

Ref: Digital Fundamentals – Thomas L. Floyd

9. Boolean algebra was developed by

- 1). George Boole
- 2). Isaac Newton
- 3). Maxwell
- 4). Faraday

✓ Correct Answer: 1). George Boole

Explanation:

George Boole introduced Boolean algebra for logical operations.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

10. The Boolean identity $A + 0$ equals

- 1). 0
- 2). A
- 3). 1
- 4). A'

☒ Correct Answer: 2). A

Explanation:

OR operation with zero does not change the variable.

Ref: Modern Digital Electronics – R.P. Jain

11. The Boolean identity $A \cdot 1$ equals

- 1). A
- 2). 0
- 3). 1
- 4). A'

☒ Correct Answer: 1). A

Explanation:

AND operation with 1 leaves variable unchanged.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

12. The complement of $A + B$ is

- 1). $A' + B'$
- 2). $A'B'$
- 3). AB
- 4). $A + B'$

☒ Correct Answer: 2). $A'B'$

Explanation:

From De Morgan's theorem: $(A+B)' = A'B'$.

Ref: Digital Fundamentals – Thomas L. Floyd

13. A half adder performs

- 1). Addition of two bits
- 2). Subtraction of two bits
- 3). Multiplication
- 4). Division

☒ Correct Answer: 1). Addition of two bits

Explanation:

Half adder produces sum and carry outputs.

Ref: Digital Systems – Tocci, Widmer and Moss

14. A full adder adds

- 1). Two bits
- 2). Three bits
- 3). Four bits
- 4). Five bits

☒ Correct Answer: 2). Three bits

Explanation:

Full adder adds two input bits and carry input.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

15. The carry output of half adder is

- 1). $A + B$
- 2). AB
- 3). $A \oplus B$
- 4). $A'B$

☒ Correct Answer: 2). AB

Explanation:

Carry occurs only when both inputs are 1.

Ref: Modern Digital Electronics – R.P. Jain

16. Flip-flop is

- 1). Combinational circuit
- 2). Sequential circuit
- 3). Analog circuit
- 4). Linear circuit

✓ Correct Answer: 2). Sequential circuit

Explanation:

Flip-flops store binary information.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

17. The basic flip-flop is

- 1). SR flip-flop
- 2). JK flip-flop
- 3). D flip-flop
- 4). T flip-flop

✓ Correct Answer: 1). SR flip-flop

Explanation:

SR flip-flop is the simplest memory element.

Ref: Modern Digital Electronics – R.P. Jain

18. JK flip-flop eliminates

- 1). Race condition
- 2). Invalid state of SR flip-flop
- 3). Timing errors
- 4). Logic errors

✓ Correct Answer: 2). Invalid state of SR flip-flop

Explanation:

JK flip-flop resolves the forbidden condition.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

19. D flip-flop is also called

- 1). Delay flip-flop
- 2). Data flip-flop
- 3). Both
- 4). None

☒ Correct Answer: 3). Both

Explanation:

D flip-flop stores data and delays it by one clock cycle.

Ref: Modern Digital Electronics – R.P. Jain

20. T flip-flop is mainly used in

- 1). Registers
- 2). Counters
- 3). Adders
- 4). Multiplexers

☒ Correct Answer: 2). Counters

Explanation:

T flip-flop toggles output on each clock pulse.

Ref: Digital Systems – Tocci, Widmer and Moss

21. Register is used to

- 1). Store binary data
- 2). Amplify signals
- 3). Detect signals
- 4). Generate signals

☒ Correct Answer: 1). Store binary data

Explanation:

Registers consist of flip-flops used for data storage.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

22. A shift register shifts data

- 1). Horizontally
- 2). Vertically
- 3). Sequentially
- 4). Randomly

✓ Correct Answer: 3). Sequentially

Explanation:

Shift registers move data bit by bit.

Ref: Modern Digital Electronics – R.P. Jain

23. Counter is used for

- 1). Counting pulses
- 2). Amplifying signals
- 3). Detecting signals
- 4). Storing signals

✓ Correct Answer: 1). Counting pulses

Explanation:

Counters count clock pulses.

Ref: Digital Systems – Tocci, Widmer and Moss

24. Asynchronous counter is also called

- 1). Ripple counter
- 2). Synchronous counter
- 3). Binary counter
- 4). Decade counter

✓ Correct Answer: 1). Ripple counter

Explanation:

Clock propagates sequentially through flip-flops.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

25. Synchronous counter uses

- 1). Single clock for all flip-flops
- 2). Separate clocks
- 3). No clock
- 4). Random clocks

✓ Correct Answer: 1). Single clock for all flip-flops

Explanation:

All flip-flops receive clock simultaneously.

Ref: Modern Digital Electronics – R.P. Jain

26. RAM stands for

- 1). Random Access Memory
- 2). Read Access Memory
- 3). Rapid Access Memory
- 4). Random Analog Memory

✓ Correct Answer: 1). Random Access Memory

Explanation:

RAM allows random read and write operations.

Ref: Digital Electronics – Anil K. Maini

27. ROM stands for

- 1). Read Only Memory
- 2). Random Only Memory
- 3). Rapid Output Memory
- 4). Read Output Module

✓ Correct Answer: 1). Read Only Memory

Explanation:

ROM stores permanent data.

Ref: Digital Electronics – Anil K. Maini

28. Flash memory is

- 1). Volatile memory
- 2). Non-volatile memory
- 3). Temporary memory
- 4). Cache memory

☒ Correct Answer: 2). Non-volatile memory

Explanation:

Flash memory retains data even when power is removed.

Ref: Digital Electronics – Anil K. Maini

29. NVROM stands for

- 1). Non-Volatile ROM
- 2). Non-Variable ROM
- 3). Network ROM
- 4). Numerical ROM

☒ Correct Answer: 1). Non-Volatile ROM

Explanation:

NVROM retains stored data without power.

Ref: Digital Electronics – Anil K. Maini

30. DAC converts

- 1). Analog to digital
- 2). Digital to analog
- 3). Frequency to voltage
- 4). Voltage to frequency

☒ Correct Answer: 2). Digital to analog

Explanation:

DAC converts binary input into analog output voltage.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

41. A binary weighted DAC uses

- 1). Equal resistors
- 2). Binary weighted resistors
- 3). Capacitors
- 4). Inductors

☒ Correct Answer: 2). Binary weighted resistors

Explanation:

Binary weighted DAC uses resistors with values R , $2R$, $4R$, $8R$ etc.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

42. The main disadvantage of binary weighted DAC is

- 1). High cost
- 2). Difficulty in maintaining precise resistor values
- 3). High power loss
- 4). Low resolution

☒ Correct Answer: 2). Difficulty in maintaining precise resistor values

Explanation:

Accurate resistor ratios become difficult for higher bit DAC.

Ref: Digital Electronics – Anil K. Maini

43. R-2R ladder DAC uses

- 1). Only two resistor values
- 2). Multiple resistor values
- 3). Capacitors only
- 4). Inductors only

☒ Correct Answer: 1). Only two resistor values

Explanation:

R-2R ladder DAC uses only R and $2R$ resistors.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

44. The advantage of R-2R DAC over binary weighted DAC is

- 1). Simpler resistor design
- 2). Higher power loss
- 3). Lower resolution
- 4). Complex circuit

✓ Correct Answer: 1). Simpler resistor design

Explanation:

Only two resistor values are required.

Ref: Digital Electronics – Anil K. Maini

45. ADC stands for

- 1). Analog to Digital Converter
- 2). Analog Data Converter
- 3). Automatic Digital Converter
- 4). Analog Detection Converter

✓ Correct Answer: 1). Analog to Digital Converter

Explanation:

ADC converts analog input signals to digital output.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

46. Counter type ADC uses

- 1). Binary counter and DAC
- 2). Oscillator and amplifier
- 3). Comparator only
- 4). Logic gates only

✓ Correct Answer: 1). Binary counter and DAC

Explanation:

Counter increases count until DAC output equals input voltage.

Ref: Digital Electronics – Anil K. Maini

47. Conversion time of counter type ADC is

- 1). Constant
- 2). Variable
- 3). Zero
- 4). Infinite

☒ Correct Answer: 2). Variable

Explanation:

Conversion time depends on input voltage.

Ref: Digital Electronics – Anil K. Maini

48. Successive approximation ADC works on

- 1). Binary search method
- 2). Counting method
- 3). Analog comparison only
- 4). Pulse method

☒ Correct Answer: 1). Binary search method

Explanation:

Successive approximation ADC determines digital output bit by bit.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

49. Conversion time of successive approximation ADC is

- 1). Variable
- 2). Constant
- 3). Infinite
- 4). Zero

☒ Correct Answer: 2). Constant

Explanation:

Conversion time depends only on number of bits.

Ref: Digital Electronics – Anil K. Maini

50. Resolution of an n-bit DAC is

- 1). $1 / (2^n - 1)$
- 2). $1 / (2^n)$
- 3). 2^n
- 4). $2^n - 1$

✓ Correct Answer: 1). $1 / (2^n - 1)$

Explanation:

Resolution represents smallest analog step.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

51. K-map is used for

- 1). Circuit amplification
- 2). Boolean expression simplification
- 3). Signal detection
- 4). Frequency conversion

✓ Correct Answer: 2). Boolean expression simplification

Explanation:

Karnaugh maps simplify logic expressions.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

52. A 3-variable K-map contains

- 1). 4 cells
- 2). 8 cells
- 3). 16 cells
- 4). 32 cells

✓ Correct Answer: 2). 8 cells

Explanation:

Number of cells = 2^n where n is number of variables.

Ref: Fundamentals of Digital Circuits – A. Anand Kumar

53. A 4-variable K-map contains

- 1). 8 cells
- 2). 16 cells
- 3). 32 cells
- 4). 64 cells

✓ Correct Answer: 2). 16 cells

Explanation:

$2^4 = 16$ cells.

Ref: Digital Fundamentals – Thomas L. Floyd

54. JK flip-flop toggles when

- 1). $J = 0, K = 0$
- 2). $J = 1, K = 1$
- 3). $J = 1, K = 0$
- 4). $J = 0, K = 1$

✓ Correct Answer: 2). $J = 1, K = 1$

Explanation:

Output toggles on each clock pulse.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

55. Race around condition occurs in

- 1). SR flip-flop
- 2). JK flip-flop
- 3). D flip-flop
- 4). T flip-flop

✓ Correct Answer: 2). JK flip-flop

Explanation:

Occurs when $J=K=1$ and clock pulse is long.

Ref: Modern Digital Electronics – R.P. Jain

56. Race around condition can be eliminated by

- 1). Increasing clock width
- 2). Master-slave flip-flop
- 3). Removing clock
- 4). Using OR gate

☒ Correct Answer: 2). Master-slave flip-flop

Explanation:

Master-slave configuration avoids multiple toggles.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

57. Modulus of a counter represents

- 1). Number of flip-flops
- 2). Maximum count
- 3). Clock frequency
- 4). Input voltage

☒ Correct Answer: 2). Maximum count

Explanation:

Modulus indicates number of states.

Ref: Modern Digital Electronics – R.P. Jain

58. A decade counter has modulus

- 1). 8
- 2). 10
- 3). 12
- 4). 16

☒ Correct Answer: 2). 10

Explanation:

Counts from 0 to 9.

Ref: Digital Systems – Tocci, Widmer and Moss

59. Number of flip-flops required for MOD-16 counter

- 1). 2
- 2). 3
- 3). 4
- 4). 5

☒ Correct Answer: 3). 4

Explanation:

$2^4 = 16$ states.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

60. Shift register used for serial to parallel conversion is

- 1). SISO
- 2). SIPO
- 3). PISO
- 4). PIPO

☒ Correct Answer: 2). SIPO

Explanation:

Serial input parallel output register converts serial data.

Ref: Modern Digital Electronics – R.P. Jain

61. Parallel input parallel output register is

- 1). SISO
- 2). SIPO
- 3). PISO
- 4). PIPO

☒ Correct Answer: 4). PIPO

Explanation:

Both input and output are parallel.

Ref: Digital Systems – Tocci, Widmer and Moss

62. SRAM stands for

- 1). Static RAM
- 2). Sequential RAM
- 3). Serial RAM
- 4). Standard RAM

☒ Correct Answer: 1). Static RAM

Explanation:

SRAM stores data using flip-flops.

Ref: Digital Electronics – Anil K. Maini

63. DRAM stores data using

- 1). Flip-flops
- 2). Capacitors
- 3). Resistors
- 4). Inductors

☒ Correct Answer: 2). Capacitors

Explanation:

DRAM stores charge on capacitors.

Ref: Digital Electronics – Anil K. Maini

64. DRAM requires

- 1). Refreshing
- 2). Amplification
- 3). Oscillation
- 4). Detection

☒ Correct Answer: 1). Refreshing

Explanation:

Charge leaks from capacitors over time.

Ref: Digital Electronics – Anil K. Maini

65. Flash ROM is

- 1). Volatile memory
- 2). Non-volatile memory
- 3). Temporary memory
- 4). Cache memory

☒ Correct Answer: 2). Non-volatile memory

Explanation:

Flash retains data without power.

Ref: Digital Electronics – Anil K. Maini

66. ROM is mainly used for

- 1). Temporary storage
- 2). Permanent program storage
- 3). Signal detection
- 4). Amplification

☒ Correct Answer: 2). Permanent program storage

Explanation:

ROM stores fixed instructions.

Ref: Digital Electronics – Anil K. Maini

67. NVROM means

- 1). Non-volatile ROM
- 2). Negative voltage ROM
- 3). Network ROM
- 4). Normal voltage ROM

☒ Correct Answer: 1). Non-volatile ROM

Explanation:

NVROM retains data without power supply.

Ref: Digital Electronics – Anil K. Maini

68. DAC output is

- 1). Digital
- 2). Analog
- 3). Pulse
- 4). Binary

☒ Correct Answer: 2). Analog

Explanation:

DAC converts digital input into analog voltage.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

69. A 4-bit DAC has how many quantization levels

- 1). 8
- 2). 16
- 3). 32
- 4). 64

☒ Correct Answer: 2). 16

Explanation:

Levels = $2^n = 2^4 = 16$.

Ref: Digital Electronics – Anil K. Maini

70. Resolution of ADC improves when

- 1). Number of bits increases
- 2). Number of bits decreases
- 3). Frequency increases
- 4). Voltage decreases

☒ Correct Answer: 1). Number of bits increases

Explanation:

Higher bits produce finer quantization.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

71. A MOD-8 counter requires how many flip-flops

- 1). 2
- 2). 3
- 3). 4
- 4). 8

☒ Correct Answer: 2). 3

Explanation:

Number of flip-flops required = $\log_2(8) = 3$.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

72. The number of states in a counter using n flip-flops is

- 1). n
- 2). $2n$
- 3). 2^n
- 4). n^2

☒ Correct Answer: 3). 2^n

Explanation:

Each flip-flop has two states; therefore total states = 2^n .

Ref: Modern Digital Electronics – R.P. Jain

73. In synchronous counters

- 1). Flip-flops are triggered sequentially
- 2). All flip-flops receive same clock signal
- 3). Clock is not used
- 4). Flip-flops are triggered randomly

☒ Correct Answer: 2). All flip-flops receive same clock signal

Explanation:

Simultaneous triggering improves speed.

Ref: Digital Systems – Tocci, Widmer and Moss

74. Ripple counters are also called

- 1). Parallel counters
- 2). Asynchronous counters
- 3). Synchronous counters
- 4). Binary counters

☒ Correct Answer: 2). Asynchronous counters

Explanation:

Clock propagates sequentially through flip-flops.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

75. The propagation delay in ripple counters

- 1). Is zero
- 2). Increases with number of flip-flops
- 3). Decreases with number of flip-flops
- 4). Remains constant

☒ Correct Answer: 2). Increases with number of flip-flops

Explanation:

Delay accumulates as signal passes through each flip-flop.

Ref: Modern Digital Electronics – R.P. Jain

76. The excitation table is mainly used for

- 1). Designing sequential circuits
- 2). Designing combinational circuits
- 3). Amplifying signals
- 4). Detecting signals

☒ Correct Answer: 1). Designing sequential circuits

Explanation:

Excitation tables determine required inputs for flip-flop state transitions.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

77. The output of a T flip-flop toggles when

- 1). $T = 0$
- 2). $T = 1$
- 3). $T = 0.5$
- 4). $T = -1$

☒ Correct Answer: 2). $T = 1$

Explanation:

When $T=1$, output changes state at each clock pulse.

Ref: Modern Digital Electronics – R.P. Jain

78. The characteristic equation of D flip-flop is

- 1). $Q_{n+1} = D$
- 2). $Q_{n+1} = JQ' + K'Q$
- 3). $Q_{n+1} = T \oplus Q$
- 4). $Q_{n+1} = Q$

☒ Correct Answer: 1). $Q_{n+1} = D$

Explanation:

Next state equals input data.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

79. The characteristic equation of JK flip-flop is

- 1). $Q_{n+1} = D$
- 2). $Q_{n+1} = JQ' + K'Q$
- 3). $Q_{n+1} = T \oplus Q$
- 4). $Q_{n+1} = Q$

☒ Correct Answer: 2). $Q_{n+1} = JQ' + K'Q$

Explanation:

Next state depends on J and K inputs.

Ref: Modern Digital Electronics – R.P. Jain

80. The characteristic equation of T flip-flop is

- 1). $Q_{n+1} = TQ' + T'Q$
- 2). $Q_{n+1} = D$
- 3). $Q_{n+1} = JQ' + K'Q$
- 4). $Q_{n+1} = Q$

☒ Correct Answer: 1). $Q_{n+1} = TQ' + T'Q$

Explanation:

T flip-flop toggles when $T=1$.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

81. Static RAM is faster than DRAM because

- 1). Uses capacitors
- 2). Uses flip-flops
- 3). Requires refreshing
- 4). Has lower power

☒ Correct Answer: 2). Uses flip-flops

Explanation:

SRAM stores data using bistable circuits.

Ref: Digital Electronics – Anil K. Maini

82. DRAM is cheaper than SRAM because

- 1). Uses simple capacitor structure
- 2). Uses flip-flops
- 3). Uses logic gates
- 4). Uses resistors

☒ Correct Answer: 1). Uses simple capacitor structure

Explanation:

DRAM cells require fewer components.

Ref: Digital Electronics – Anil K. Maini

83. The access time of memory refers to

- 1). Time required to read data
- 2). Time required to write data
- 3). Time required to access memory location
- 4). Time required to store data

☒ Correct Answer: 3). Time required to access memory location

Explanation:

Access time is delay between request and availability of data.

Ref: Digital Electronics – Anil K. Maini

84. Flash memory is widely used in

- 1). Hard disks
- 2). USB drives
- 3). CRT monitors
- 4). Amplifiers

☒ Correct Answer: 2). USB drives

Explanation:

Flash memory stores data without power.

Ref: Digital Electronics – Anil K. Maini

85. DAC output voltage depends on

- 1). Input digital code
- 2). Clock frequency
- 3). Power supply
- 4). Input current

☒ Correct Answer: 1). Input digital code

Explanation:

Digital input determines analog output level.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

86. In an n-bit DAC maximum output levels are

- 1). n
- 2). n^2
- 3). 2^n
- 4). $2n$

☒ Correct Answer: 3). 2^n

Explanation:

Each bit doubles number of output levels.

Ref: Digital Electronics – Anil K. Maini

87. In ADC quantization error is

- 1). Difference between actual and quantized value
- 2). Amplification error
- 3). Sampling error
- 4). Timing error

☒ Correct Answer: 1). Difference between actual and quantized value

Explanation:

Occurs due to finite quantization levels.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

88. The conversion speed of successive approximation ADC is

- 1). Slow
- 2). Fast
- 3). Moderate
- 4). Zero

☒ Correct Answer: 2). Fast

Explanation:

Binary search algorithm speeds up conversion.

Ref: Digital Electronics – Anil K. Maini

89. Counter type ADC is also called

- 1). Ramp ADC
- 2). Flash ADC
- 3). Parallel ADC
- 4). Delta ADC

☒ Correct Answer: 1). Ramp ADC

Explanation:

DAC output forms ramp until equal to input voltage.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

90. Flash ADC is fastest because

- 1). Uses comparators in parallel
- 2). Uses counters
- 3). Uses sequential method
- 4). Uses DAC only

☒ Correct Answer: 1). Uses comparators in parallel

Explanation:

Parallel comparison speeds up conversion.

Ref: Digital Electronics – Anil K. Maini

91. The smallest analog change detectable by ADC is

- 1). Resolution
- 2). Quantization
- 3). Sampling rate
- 4). Gain

☒ Correct Answer: 1). Resolution

Explanation:

Resolution defines smallest detectable voltage.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

92. Resolution of 8-bit ADC is

- 1). 1/255
- 2). 1/256
- 3). 1/128
- 4). 1/64

✓ Correct Answer: 1). 1/255

Explanation:

Resolution $\approx 1/(2^8-1)$.

Ref: Digital Electronics – Anil K. Maini

93. Boolean expression $AB + AB'$ simplifies to

- 1). A
- 2). B
- 3). A'
- 4). B'

✓ Correct Answer: 1). A

Explanation:

Using Boolean algebra: $AB + AB' = A(B + B') = A$.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

94. The output of NAND gate with inputs A=1, B=1 is

- 1). 1
- 2). 0
- 3). A
- 4). B

✓ Correct Answer: 2). 0

Explanation:

NAND = NOT(AND). AND=1 $\rightarrow$ output=0.

Ref: Digital Fundamentals – Thomas L. Floyd

95. XOR gate is mainly used in

- 1). Comparators
- 2). Adders
- 3). Counters
- 4). Registers

✓ Correct Answer: 2). Adders

Explanation:

Sum output of half adder uses XOR gate.

Ref: Modern Digital Electronics – R.P. Jain

96. The carry output of full adder is

- 1). $A \oplus B$
- 2). $AB + BC + AC$
- 3). $A + B$
- 4). AB

✓ Correct Answer: 2). $AB + BC + AC$

Explanation:

Carry occurs when at least two inputs are high.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

97. Shift registers are mainly used for

- 1). Data storage and transfer
- 2). Amplification
- 3). Detection
- 4). Modulation

✓ Correct Answer: 1). Data storage and transfer

Explanation:

Registers store and move data between circuits.

Ref: Modern Digital Electronics – R.P. Jain

98. Parallel data transfer is

- 1). Faster than serial
- 2). Slower than serial
- 3). Equal speed
- 4). Random

☒ Correct Answer: 1). Faster than serial

Explanation:

Multiple bits transferred simultaneously.

Ref: Digital Systems – Tocci, Widmer and Moss

99. Serial communication transmits

- 1). One bit at a time
- 2). Multiple bits simultaneously
- 3). Random bits
- 4). Analog signals

☒ Correct Answer: 1). One bit at a time

Explanation:

Data transmitted sequentially through single channel.

Ref: Digital Systems – Tocci, Widmer and Moss

100. The main advantage of digital circuits is

- 1). High noise sensitivity
- 2). Low reliability
- 3). High noise immunity
- 4). Low speed

☒ Correct Answer: 3). High noise immunity

Explanation:

Digital circuits are less affected by noise compared to analog circuits.

Ref: Modern Digital Electronics – R.P. Jain

8. MICROCONTROLLERS

1. The 8051 microcontroller is an

- 1). 4-bit microcontroller
- 2). 8-bit microcontroller
- 3). 16-bit microcontroller
- 4). 32-bit microcontroller

✓ Correct Answer: 2). 8-bit microcontroller

Explanation:

The 8051 processes data in 8-bit units and has an 8-bit ALU.

Ref: The 8051 Microcontroller and Embedded Systems – Muhammad Ali Mazidi, Janice Mazidi, Rolin McKinlay

2. The program memory size of standard 8051 is

- 1). 2 KB
- 2). 4 KB
- 3). 8 KB
- 4). 16 KB

✓ Correct Answer: 2). 4 KB

Explanation:

The original 8051 contains 4 KB of on-chip ROM.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

3. Internal RAM of 8051 is

- 1). 64 bytes
- 2). 128 bytes
- 3). 256 bytes
- 4). 512 bytes

✓ Correct Answer: 2). 128 bytes

Explanation:

The standard 8051 has 128 bytes of internal RAM.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

4. The accumulator register in 8051 is

- 1). A
- 2). B
- 3). R0
- 4). PSW

☒ Correct Answer: 1). A

Explanation:

Accumulator A is used for most arithmetic and logic operations.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

5. The register used in multiplication and division operations is

- 1). A register
- 2). B register
- 3). R7 register
- 4). DPTR

☒ Correct Answer: 2). B register

Explanation:

Register B works with accumulator in MUL and DIV instructions.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

6. The data pointer register in 8051 is

- 1). PSW
- 2). SP
- 3). DPTR
- 4). ACC

☒ Correct Answer: 3). DPTR

Explanation:

DPTR is a 16-bit register used for addressing external memory.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

7. The stack pointer register is

- 1). SP
- 2). PSW
- 3). PC
- 4). DPTR

☒ Correct Answer: 1). SP

Explanation:

SP points to the top of stack in RAM.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

8. The Program Counter (PC) is used to

- 1). Store data
- 2). Store address of next instruction
- 3). Store flags
- 4). Store accumulator

☒ Correct Answer: 2). Store address of next instruction

Explanation:

PC holds address of instruction to be executed.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

9. The number of register banks in 8051 is

- 1). 2
- 2). 4
- 3). 6
- 4). 8

☒ Correct Answer: 2). 4

Explanation:

8051 has four register banks each containing R0–R7.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

10. The Special Function Registers (SFRs) are located in

- 1). Lower RAM
- 2). Upper RAM
- 3). ROM
- 4). Stack

☒ Correct Answer: 2). Upper RAM

Explanation:

SFRs occupy addresses from 80H to FFH.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

11. PSW stands for

- 1). Program Status Word
- 2). Processor Status Word
- 3). Program Signal Word
- 4). Processor Signal Word

☒ Correct Answer: 1). Program Status Word

Explanation:

PSW contains flags and register bank select bits.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

12. The flag register in 8051 is

- 1). SP
- 2). PSW
- 3). DPTR
- 4). ACC

☒ Correct Answer: 2). PSW

Explanation:

PSW stores flags like carry, auxiliary carry, overflow.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

13. The carry flag is set when

- 1). Result is negative
- 2). Arithmetic overflow occurs
- 3). Carry out from MSB occurs
- 4). Result is zero

☒ Correct Answer: 3). Carry out from MSB occurs

Explanation:

Carry flag indicates overflow beyond 8 bits.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

14. The instruction MOV A,#25H uses

- 1). Direct addressing
- 2). Immediate addressing
- 3). Indirect addressing
- 4). Indexed addressing

☒ Correct Answer: 2). Immediate addressing

Explanation:

Immediate value 25H is loaded into accumulator.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

15. The instruction MOV A,R1 uses

- 1). Register addressing
- 2). Immediate addressing
- 3). Direct addressing
- 4). Indirect addressing

☒ Correct Answer: 1). Register addressing

Explanation:

Data is moved from register R1 to accumulator.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

16. The instruction MOV A,@R0 uses

- 1). Immediate addressing
- 2). Register addressing
- 3). Indirect addressing
- 4). Indexed addressing

☒ Correct Answer: 3). Indirect addressing

Explanation:

R0 contains address of data.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

17. The instruction used to call subroutine is

- 1). RET
- 2). CALL
- 3). JMP
- 4). MOV

☒ Correct Answer: 2). CALL

Explanation:

CALL transfers control to subroutine.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

18. The instruction used to return from subroutine is

- 1). JMP
- 2). CALL
- 3). RET
- 4). MOV

☒ Correct Answer: 3). RET

Explanation:

RET returns control to main program.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

19. The stack in 8051 grows toward

- 1). Lower memory addresses
- 2). Higher memory addresses
- 3). Both directions
- 4). Fixed location

☒ Correct Answer: 2). Higher memory addresses

Explanation:

Stack pointer increments as data is pushed.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

20. PUSH instruction is used to

- 1). Store data in stack
- 2). Remove data from stack
- 3). Move data to register
- 4). Transfer control

☒ Correct Answer: 1). Store data in stack

Explanation:

PUSH places data onto stack.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

41. The POP instruction is used to

- 1). Store data in stack
- 2). Retrieve data from stack
- 3). Move data to accumulator
- 4). Jump to subroutine

☒ Correct Answer: 2). Retrieve data from stack

Explanation:

POP removes the top value from stack and stores it in the specified register.

Ref: The 8051 Microcontroller and Embedded Systems – Muhammad Ali Mazidi

42. The instruction DJNZ stands for

- 1). Decrement and Jump if Not Zero
- 2). Divide and Jump if Not Zero
- 3). Decrement and Jump if Zero
- 4). Divide and Jump if Zero

✓ Correct Answer: 1). Decrement and Jump if Not Zero

Explanation:

DJNZ decrements a register and jumps if result is not zero.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

43. The instruction used for unconditional jump is

- 1). JNZ
- 2). JMP
- 3). DJNZ
- 4). CJNE

✓ Correct Answer: 2). JMP

Explanation:

JMP transfers control to a specified memory address unconditionally.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

44. The instruction CJNE means

- 1). Compare and Jump if Not Equal
- 2). Compare and Jump if Equal
- 3). Compare and Jump if Greater
- 4). Compare and Jump if Less

✓ Correct Answer: 1). Compare and Jump if Not Equal

Explanation:

CJNE compares two values and jumps if they are not equal.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

45. The instruction used to complement accumulator is

- 1). CPL A
- 2). COM A
- 3). NEG A
- 4). INV A

☒ Correct Answer: 1). CPL A

Explanation:

CPL instruction complements accumulator bits.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

46. The instruction CLR A performs

- 1). Clears accumulator
- 2). Clears stack pointer
- 3). Clears program counter
- 4). Clears PSW

☒ Correct Answer: 1). Clears accumulator

Explanation:

CLR A sets accumulator contents to zero.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

47. The instruction SETB P1.0 is used to

- 1). Clear bit
- 2). Set bit
- 3). Toggle bit
- 4). Compare bit

☒ Correct Answer: 2). Set bit

Explanation:

SETB sets specified bit to logic 1.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

48. The instruction used to toggle a bit is

- 1). CLR
- 2). CPL
- 3). MOV
- 4). SETB

☒ Correct Answer: 2). CPL

Explanation:

CPL instruction complements specified bit.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

49. The number of I/O ports in 8051 is

- 1). 2
- 2). 3
- 3). 4
- 4). 5

☒ Correct Answer: 3). 4

Explanation:

Ports P0, P1, P2, and P3 provide I/O functionality.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

50. Each port in 8051 has

- 1). 4 pins
- 2). 8 pins
- 3). 16 pins
- 4). 32 pins

☒ Correct Answer: 2). 8 pins

Explanation:

Each port is 8-bit wide.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

51. Port P0 is used for

- 1). General I/O only
- 2). Address and data bus
- 3). Timer input
- 4). Interrupt input

☒ Correct Answer: 2). Address and data bus

Explanation:

Port P0 multiplexes address and data lines.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

52. Port P3 pins provide

- 1). General I/O only
- 2). Special functions
- 3). Memory control
- 4). Power control

☒ Correct Answer: 2). Special functions

Explanation:

Port P3 pins include interrupts, serial communication, and timers.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

53. The machine cycle of 8051 consists of

- 1). 6 clock cycles
- 2). 12 clock cycles
- 3). 24 clock cycles
- 4). 48 clock cycles

☒ Correct Answer: 2). 12 clock cycles

Explanation:

One machine cycle requires 12 oscillator periods.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

54. If crystal frequency is 12 MHz, machine cycle time is

- 1). 0.5 μ s
- 2). 1 μ s
- 3). 2 μ s
- 4). 4 μ s

☒ Correct Answer: 2). 1 μ s

Explanation:

Machine cycle = $12 / 12 \text{ MHz} = 1 \mu\text{s}$.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

55. Time delay programs are mainly created using

- 1). MOV instruction
- 2). DJNZ instruction
- 3). ADD instruction
- 4). OR instruction

☒ Correct Answer: 2). DJNZ instruction

Explanation:

Loops using DJNZ create delays.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

56. ORG directive is used to

- 1). Define variable
- 2). Specify program origin
- 3). End program
- 4). Define constant

☒ Correct Answer: 2). Specify program origin

Explanation:

ORG sets starting address of program.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

57. EQU directive is used to

- 1). Define constant value
- 2). End program
- 3). Jump instruction
- 4). Call subroutine

☒ Correct Answer: 1). Define constant value

Explanation:

EQU assigns symbolic name to constant.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

58. DB directive is used to

- 1). Define byte
- 2). Define bit
- 3). Define register
- 4). Define address

☒ Correct Answer: 1). Define byte

Explanation:

DB stores data byte in memory.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

59. END directive indicates

- 1). Start of program
- 2). End of assembly program
- 3). Subroutine start
- 4). Interrupt start

☒ Correct Answer: 2). End of assembly program

Explanation:

END marks end of source program.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

60. Peripheral IC 8255 is

- 1). Timer
- 2). Programmable Peripheral Interface
- 3). Interrupt controller
- 4). Memory chip

☒ Correct Answer: 2). Programmable Peripheral Interface

Explanation:

8255 provides programmable I/O ports.

Ref: Microprocessors and Interfacing – Douglas V. Hall

61. The 8255 provides

- 1). 8 I/O lines
- 2). 16 I/O lines
- 3). 24 I/O lines
- 4). 32 I/O lines

☒ Correct Answer: 3). 24 I/O lines

Explanation:

Ports A, B, C provide 24 programmable I/O lines.

Ref: Microprocessors and Interfacing – Douglas V. Hall

62. The ports of 8255 are

- 1). A, B, C
- 2). P0, P1, P2
- 3). X, Y, Z
- 4). R0, R1, R2

☒ Correct Answer: 1). A, B, C

Explanation:

8255 has three ports named A, B and C.

Ref: Microprocessors and Interfacing – Douglas V. Hall

63. Mode 0 of 8255 is

- 1). Basic input output mode
- 2). Handshake mode
- 3). Bidirectional mode
- 4). Interrupt mode

☒ Correct Answer: 1). Basic input output mode

Explanation:

Mode 0 provides simple input/output operations.

Ref: Microprocessors and Interfacing – Douglas V. Hall

64. Mode 1 of 8255 is

- 1). Basic mode
- 2). Handshake I/O mode
- 3). Bidirectional mode
- 4). Interrupt mode

☒ Correct Answer: 2). Handshake I/O mode

Explanation:

Mode 1 provides handshake signals for data transfer.

Ref: Microprocessors and Interfacing – Douglas V. Hall

65. Mode 2 of 8255 supports

- 1). Simple output
- 2). Bidirectional bus
- 3). Timer function
- 4). Interrupt function

☒ Correct Answer: 2). Bidirectional bus

Explanation:

Mode 2 supports bidirectional communication.

Ref: Microprocessors and Interfacing – Douglas V. Hall

66. The stack in 8051 is located in

- 1). ROM
- 2). RAM
- 3). External memory
- 4). Flash memory

☒ Correct Answer: 2). RAM

Explanation:

Stack is stored in internal RAM.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

67. Default stack pointer value in 8051 is

- 1). 00H
- 2). 07H
- 3). 10H
- 4). FFH

☒ Correct Answer: 2). 07H

Explanation:

SP initially points to address 07H.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

68. Interrupts are used for

- 1). Program branching
- 2). Handling external events
- 3). Arithmetic operations
- 4). Memory addressing

☒ Correct Answer: 2). Handling external events

Explanation:

Interrupts allow processor to respond to events.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

69. The number of interrupts in 8051 is

- 1). 3
- 2). 5
- 3). 8
- 4). 10

☒ Correct Answer: 2). 5

Explanation:

8051 supports five interrupt sources.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

70. Timer in 8051 is used for

- 1). Delay generation
- 2). Frequency measurement
- 3). Event counting
- 4). All of the above

☒ Correct Answer: 4). All of the above

Explanation:

Timers perform multiple timing operations.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

71. The 8051 contains how many timers

- 1). 1
- 2). 2
- 3). 3
- 4). 4

☒ Correct Answer: 2). 2

Explanation:

The standard 8051 microcontroller has **Timer-0 and Timer-1**, each 16-bit timers.

Ref: The 8051 Microcontroller and Embedded Systems – Muhammad Ali Mazidi

72. The timers of 8051 can operate in

- 1). One mode
- 2). Two modes
- 3). Three modes
- 4). Four modes

☒ Correct Answer: 4). Four modes

Explanation:

8051 timers operate in **Mode 0, Mode 1, Mode 2 and Mode 3**.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

73. Mode-0 timer operation corresponds to

- 1). 8-bit timer
- 2). 13-bit timer
- 3). 16-bit timer
- 4). 32-bit timer

☒ Correct Answer: 2). 13-bit timer

Explanation:

Mode-0 timer uses 13-bit counting.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

74. Mode-1 timer operation corresponds to

- 1). 8-bit timer
- 2). 13-bit timer
- 3). 16-bit timer
- 4). 32-bit timer

☒ Correct Answer: 3). 16-bit timer

Explanation:

Mode-1 provides full **16-bit timer/counter operation**.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

75. Mode-2 timer is

- 1). 16-bit timer
- 2). 8-bit auto-reload timer
- 3). 13-bit timer
- 4). 32-bit timer

☒ Correct Answer: 2). 8-bit auto-reload timer

Explanation:

In Mode-2, timer automatically reloads from TH register.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

76. The register used to control timer modes is

- 1). TCON
- 2). TMOD
- 3). PSW
- 4). SCON

☒ Correct Answer: 2). TMOD

Explanation:

TMOD register selects timer mode and operation.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

77. The register used to control timer flags is

- 1). TMOD
- 2). TCON
- 3). PSW
- 4). IE

✓ Correct Answer: 2). TCON

Explanation:

TCON register contains timer control and overflow flags.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

78. Serial communication in 8051 uses

- 1). SBUF register
- 2). SP register
- 3). PSW register
- 4). DPTR register

✓ Correct Answer: 1). SBUF register

Explanation:

SBUF is used to transmit and receive serial data.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

79. The serial control register is

- 1). SCON
- 2). TMOD
- 3). PSW
- 4). TCON

✓ Correct Answer: 1). SCON

Explanation:

SCON controls serial communication modes.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

80. The number of serial communication modes in 8051 is

- 1). 2
- 2). 3
- 3). 4
- 4). 5

✓ Correct Answer: 3). 4

Explanation:

8051 supports **four serial communication modes**.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

81. Baud rate in 8051 serial communication is controlled by

- 1). Timer-1
- 2). Timer-0
- 3). Accumulator
- 4). Stack pointer

✓ Correct Answer: 1). Timer-1

Explanation:

Timer-1 generates baud rate for serial communication.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

82. The instruction INC A performs

- 1). Increment accumulator
- 2). Decrement accumulator
- 3). Clear accumulator
- 4). Complement accumulator

✓ Correct Answer: 1). Increment accumulator

Explanation:

INC increases value of accumulator by 1.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

83. The instruction DEC A performs

- 1). Increment accumulator
- 2). Decrement accumulator
- 3). Complement accumulator
- 4). Clear accumulator

✓ Correct Answer: 2). Decrement accumulator

Explanation:

DEC reduces value in accumulator by one.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

84. The instruction ADD A,R1 performs

- 1). Subtraction
- 2). Addition
- 3). Multiplication
- 4). Division

✓ Correct Answer: 2). Addition

Explanation:

Value of R1 is added to accumulator.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

85. The instruction SUBB means

- 1). Subtract with borrow
- 2). Subtract without borrow
- 3). Multiply
- 4). Divide

✓ Correct Answer: 1). Subtract with borrow

Explanation:

SUBB subtracts with carry/borrow.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

86. The instruction MUL AB multiplies

- 1). A and R0
- 2). A and B
- 3). B and R1
- 4). A and DPTR

✓ Correct Answer: 2). A and B

Explanation:

Product stored in A and B registers.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

87. The instruction DIV AB divides

- 1). A by B
- 2). B by A
- 3). A by R0
- 4). B by R1

✓ Correct Answer: 1). A by B

Explanation:

Quotient stored in A and remainder in B.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

88. Bit-addressable RAM area in 8051 is

- 1). 00H–1FH
- 2). 20H–2FH
- 3). 30H–3FH
- 4). 40H–4FH

✓ Correct Answer: 2). 20H–2FH

Explanation:

These locations allow individual bit addressing.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

89. The number of bits in bit-addressable RAM is

- 1). 64 bits
- 2). 128 bits
- 3). 256 bits
- 4). 512 bits

✓ Correct Answer: 2). 128 bits

Explanation:

$16 \text{ bytes} \times 8 \text{ bits} = 128 \text{ bits}$.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

90. The interrupt enable register is

- 1). IE
- 2). IP
- 3). PSW
- 4). TCON

✓ Correct Answer: 1). IE

Explanation:

IE register enables or disables interrupts.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

91. Interrupt priority register is

- 1). IE
- 2). IP
- 3). PSW
- 4). TMOD

✓ Correct Answer: 2). IP

Explanation:

IP determines interrupt priority.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

92. External interrupt pins in 8051 are

- 1). P1.0 and P1.1
- 2). P3.2 and P3.3
- 3). P2.0 and P2.1
- 4). P0.0 and P0.1

✓ Correct Answer: 2). P3.2 and P3.3

Explanation:

These pins correspond to INT0 and INT1.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

93. Machine cycle of 8051 with 11.0592 MHz crystal is approximately

- 1). 0.5 μ s
- 2). 1.085 μ s
- 3). 2 μ s
- 4). 5 μ s

☒ Correct Answer: 2). 1.085 μ s

Explanation:

Machine cycle = $12 / 11.0592 \text{ MHz}$.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

94. Delay loops in 8051 are implemented using

- 1). MOV instruction
- 2). DJNZ instruction
- 3). ADD instruction
- 4). OR instruction

☒ Correct Answer: 2). DJNZ instruction

Explanation:

DJNZ creates loop-based delay.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

95. Assembler directive used to store string is

- 1). DB
- 2). ORG
- 3). END
- 4). EQU

☒ Correct Answer: 1). DB

Explanation:

DB defines bytes such as ASCII characters.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

96. Instruction size in 8051 ranges from

- 1). 1–2 bytes
- 2). 1–3 bytes
- 3). 2–4 bytes
- 4). 4–6 bytes

☒ Correct Answer: 2). 1–3 bytes

Explanation:

Instructions can be one, two, or three bytes long.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

97. The maximum external program memory supported by 8051 is

- 1). 32 KB
- 2). 64 KB
- 3). 128 KB
- 4). 256 KB

☒ Correct Answer: 2). 64 KB

Explanation:

8051 supports up to 64 KB external program memory.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

98. The maximum external data memory supported by 8051 is

- 1). 32 KB
- 2). 64 KB
- 3). 128 KB
- 4). 256 KB

☒ Correct Answer: 2). 64 KB

Explanation:

External RAM addressing limit is 64 KB.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

99. The microcontroller combines

- 1). CPU and memory only
- 2). CPU, memory and I/O
- 3). CPU and I/O only
- 4). Memory and I/O only

☒ Correct Answer: 2). CPU, memory and I/O

Explanation:

Microcontrollers integrate CPU, memory, and peripherals.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

100. The main advantage of microcontrollers is

- 1). High cost
- 2). Compact embedded system design
- 3). Low processing capability
- 4). Limited applications

☒ Correct Answer: 2). Compact embedded system design

Explanation:

Microcontrollers integrate components for embedded applications.

Ref: Microcontrollers: Architecture, Programming, Interfacing and System Design – Raj Kamal

9. DATA COMMUNICATIONS AND COMPUTER NETWORKS

1. The basic element of data communication system is

- 1). Message
- 2). Medium
- 3). Sender and receiver
- 4). All of the above

☒ Correct Answer: 4). All of the above

Explanation:

A communication system includes sender, receiver, message, transmission medium and protocol.

Ref: Data Communications and Networking – Behrouz A. Forouzan

2. Twisted pair cables are mainly used in

- 1). Telephone networks
- 2). Satellite communication
- 3). Microwave communication
- 4). Radar systems

☒ Correct Answer: 1). Telephone networks

Explanation:

Twisted pair cables are widely used in telephone and LAN connections.

Ref: Computer Networks – Andrew S. Tanenbaum and David J. Wetherall

3. UTP stands for

- 1). Unshielded Twisted Pair
- 2). Universal Twisted Pair
- 3). Unified Transmission Pair
- 4). Ultra Twisted Pair

☒ Correct Answer: 1). Unshielded Twisted Pair

Explanation:

UTP cables have no shielding around twisted conductors.

Ref: Data Communications and Networking – Behrouz A. Forouzan

4. STP stands for

- 1). Shielded Twisted Pair
- 2). Standard Twisted Pair
- 3). Shield Transmission Pair
- 4). Secure Twisted Pair

✓ Correct Answer: 1). Shielded Twisted Pair

Explanation:

STP cables include shielding to reduce electromagnetic interference.

Ref: Data Communications and Networking – Behrouz A. Forouzan

5. Coaxial cable consists of

- 1). Single conductor
- 2). Two parallel wires
- 3). Central conductor with shielding
- 4). Optical fiber core

✓ Correct Answer: 3). Central conductor with shielding

Explanation:

Coaxial cable has a central conductor surrounded by insulation and shielding.

Ref: Computer Networks – Andrew S. Tanenbaum

6. Optical fiber communication uses

- 1). Electrical signals
- 2). Light signals
- 3). Radio signals
- 4). Microwave signals

✓ Correct Answer: 2). Light signals

Explanation:

Fiber optics transmit information through light pulses.

Ref: Data Communications and Networking – Behrouz A. Forouzan

7. Optical fiber has advantage of

- 1). High attenuation
- 2). Low bandwidth
- 3). High bandwidth and low loss
- 4). High interference

✓ Correct Answer: 3). High bandwidth and low loss

Explanation:

Fiber optics provide high data rates and immunity to electromagnetic interference.

Ref: Computer Networks – Andrew S. Tanenbaum

8. Shannon capacity theorem determines

- 1). Maximum data rate of channel
- 2). Signal frequency
- 3). Signal amplitude
- 4). Signal power

✓ Correct Answer: 1). Maximum data rate of channel

Explanation:

Shannon theorem defines maximum theoretical channel capacity.

Ref: Data Communications and Networking – Behrouz A. Forouzan

9. Shannon capacity equation is

- 1). $C = B \log_2(1 + S/N)$
- 2). $C = B + S/N$
- 3). $C = S/N$
- 4). $C = B \log(S/N)$

✓ Correct Answer: 1). $C = B \log_2(1 + S/N)$

Explanation:

Channel capacity depends on bandwidth and signal-to-noise ratio.

Ref: Data Communications and Networking – Behrouz A. Forouzan

10. In BUS topology all nodes are connected to

- 1). Central hub
- 2). Single backbone cable
- 3). Ring network
- 4). Mesh network

✓ Correct Answer: 2). Single backbone cable

Explanation:

All devices share one common communication line.

Ref: Computer Networks – Andrew S. Tanenbaum

11. In STAR topology all nodes are connected to

- 1). Bus cable
- 2). Central hub
- 3). Ring cable
- 4). Multiple cables

✓ Correct Answer: 2). Central hub

Explanation:

Each node communicates through central hub.

Ref: Data Communications and Networking – Behrouz A. Forouzan

12. In RING topology data flows

- 1). In one direction around ring
- 2). Randomly
- 3). Through central hub
- 4). Through backbone cable

✓ Correct Answer: 1). In one direction around ring

Explanation:

Nodes form a closed loop structure.

Ref: Computer Networks – Andrew S. Tanenbaum

13. Packet switching divides message into

- 1). Frames
- 2). Packets
- 3). Segments
- 4). Blocks

☒ Correct Answer: 2). Packets

Explanation:

Each packet transmitted independently across network.

Ref: Data and Computer Communications – William Stallings

14. Message switching transmits

- 1). Entire message at once
- 2). Packets only
- 3). Frames only
- 4). Bits only

☒ Correct Answer: 1). Entire message at once

Explanation:

Message switching sends complete message as a unit.

Ref: Data and Computer Communications – William Stallings

15. OSI model has how many layers

- 1). 5
- 2). 6
- 3). 7
- 4). 8

☒ Correct Answer: 3). 7

Explanation:

OSI model consists of seven layers.

Ref: Computer Networking – James Kurose and Keith Ross

16. The top layer of OSI model is

- 1). Network layer
- 2). Application layer
- 3). Transport layer
- 4). Data link layer

✓ Correct Answer: 2). Application layer

Explanation:

Application layer provides services to end users.

Ref: Data Communications and Networking – Behrouz A. Forouzan

17. The lowest layer of OSI model is

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 1). Physical layer

Explanation:

Physical layer deals with transmission of raw bits.

Ref: Computer Networks – Andrew S. Tanenbaum

18. Error detection occurs in

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Application layer

✓ Correct Answer: 2). Data link layer

Explanation:

Data link layer detects transmission errors.

Ref: Data Communications and Networking – Behrouz A. Forouzan

19. Routing function belongs to

- 1). Physical layer
- 2). Network layer
- 3). Transport layer
- 4). Application layer

✓ Correct Answer: 2). Network layer

Explanation:

Network layer determines path for packet delivery.

Ref: Computer Networks – Andrew S. Tanenbaum

20. CSMA stands for

- 1). Carrier Sense Multiple Access
- 2). Carrier Signal Multiple Access
- 3). Communication System Multiple Access
- 4). Carrier Shared Media Access

✓ Correct Answer: 1). Carrier Sense Multiple Access

Explanation:

Nodes sense channel before transmitting.

Ref: Data Communications and Networking – Behrouz A. Forouzan

41. CSMA/CD is mainly used in

- 1). Ethernet networks
- 2). Satellite communication
- 3). Microwave communication
- 4). Optical fiber communication

✓ Correct Answer: 1). Ethernet networks

Explanation:

Carrier Sense Multiple Access with Collision Detection is used in Ethernet LANs.

Ref: Data Communications and Networking – Behrouz A. Forouzan

42. Token Ring protocol uses

- 1). Bus topology
- 2). Ring topology
- 3). Star topology
- 4). Mesh topology

✓ Correct Answer: 2). Ring topology

Explanation:

In token ring networks, data transmission occurs around a logical ring.

Ref: Computer Networks – Andrew S. Tanenbaum and David J. Wetherall

43. CDMA stands for

- 1). Carrier Division Multiple Access
- 2). Code Division Multiple Access
- 3). Communication Data Multiple Access
- 4). Code Digital Modulation Access

✓ Correct Answer: 2). Code Division Multiple Access

Explanation:

CDMA allows multiple users to share the same frequency using unique codes.

Ref: Data Communications and Networking – Behrouz A. Forouzan

44. Wireless LAN commonly follows IEEE standard

- 1). 802.3
- 2). 802.5
- 3). 802.11
- 4). 802.16

✓ Correct Answer: 3). 802.11

Explanation:

IEEE 802.11 defines WLAN standards.

Ref: Computer Networking: A Top-Down Approach – James Kurose and Keith Ross

45. Bluetooth technology is used for

- 1). Long-distance communication
- 2). Short-range wireless communication
- 3). Satellite communication
- 4). Microwave communication

✓ Correct Answer: 2). Short-range wireless communication

Explanation:

Bluetooth connects devices within about 10 meters.

Ref: Data Communications and Networking – Behrouz A. Forouzan

46. A Bluetooth network is called

- 1). Cluster
- 2). Piconet
- 3). Subnet
- 4). Intranet

✓ Correct Answer: 2). Piconet

Explanation:

Bluetooth devices form a small network called piconet.

Ref: Computer Networks – Andrew S. Tanenbaum

47. WAN stands for

- 1). Wide Area Network
- 2). Wireless Area Network
- 3). World Access Network
- 4). Wide Access Node

✓ Correct Answer: 1). Wide Area Network

Explanation:

WAN connects networks over large geographical areas.

Ref: Data Communications and Networking – Behrouz A. Forouzan

48. ARPANET was developed by

- 1). IBM
- 2). Microsoft
- 3). US Department of Defense
- 4). Google

☒ Correct Answer: 3). US Department of Defense

Explanation:

ARPANET was the precursor to the modern Internet.

Ref: Computer Networks – Andrew S. Tanenbaum

49. ISP stands for

- 1). Internet Service Provider
- 2). Internet Signal Provider
- 3). Internal Service Protocol
- 4). Internet System Program

☒ Correct Answer: 1). Internet Service Provider

Explanation:

ISP provides internet access to users.

Ref: Data Communications and Networking – Behrouz A. Forouzan

50. ISDN stands for

- 1). Integrated Services Digital Network
- 2). International Service Data Network
- 3). Integrated Signal Data Network
- 4). Internal Service Digital Network

☒ Correct Answer: 1). Integrated Services Digital Network

Explanation:

ISDN integrates voice, data and video services.

Ref: Data and Computer Communications – William Stallings

51. X.25 protocol is used in

- 1). LAN
- 2). WAN
- 3). PAN
- 4). WLAN

✓ Correct Answer: 2). WAN

Explanation:

X.25 is an early packet-switched WAN protocol.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

52. Frame Relay is

- 1). Circuit switching technology
- 2). Packet switching technology
- 3). Optical communication
- 4). Satellite communication

✓ Correct Answer: 2). Packet switching technology

Explanation:

Frame Relay uses packet switching for fast data transfer.

Ref: Data Communications and Networking – Behrouz A. Forouzan

53. ATM stands for

- 1). Asynchronous Transfer Mode
- 2). Automatic Transfer Mode
- 3). Analog Transmission Method
- 4). Advanced Transfer Mechanism

✓ Correct Answer: 1). Asynchronous Transfer Mode

Explanation:

ATM uses fixed-size cells for high-speed communication.

Ref: Data and Computer Communications – William Stallings

54. ATM uses fixed cell size of

- 1). 32 bytes
- 2). 48 bytes
- 3). 53 bytes
- 4). 64 bytes

☒ Correct Answer: 3). 53 bytes

Explanation:

ATM cells contain 48 bytes payload and 5 bytes header.

Ref: Data Communications and Networking – Behrouz A. Forouzan

55. TCP stands for

- 1). Transmission Control Protocol
- 2). Transfer Control Protocol
- 3). Transport Control Protocol
- 4). Transmission Communication Protocol

☒ Correct Answer: 1). Transmission Control Protocol

Explanation:

TCP ensures reliable data transmission.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

56. IP stands for

- 1). Internet Protocol
- 2). Internal Protocol
- 3). Internet Process
- 4). Internal Process

☒ Correct Answer: 1). Internet Protocol

Explanation:

IP handles addressing and routing of packets.

Ref: Internetworking with TCP/IP – Douglas E. Comer

57. TCP/IP model consists of

- 1). 3 layers
- 2). 4 layers
- 3). 5 layers
- 4). 7 layers

☒ Correct Answer: 2). 4 layers

Explanation:

TCP/IP layers are Network Access, Internet, Transport, Application.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

58. Port number used for HTTP is

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 3). 80

Explanation:

HTTP uses port 80.

Ref: Computer Networking: A Top-Down Approach – Kurose and Ross

59. FTP uses port number

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 1). 21

Explanation:

FTP uses port 21 for file transfer control.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

60. SMTP uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 2). 25

Explanation:

SMTP is used for sending emails.

Ref: Computer Networks – Andrew S. Tanenbaum

61. POP stands for

- 1). Post Office Protocol
- 2). Packet Office Protocol
- 3). Process Office Protocol
- 4). Protocol Office Process

☒ Correct Answer: 1). Post Office Protocol

Explanation:

POP retrieves email from mail server.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

62. POP3 typically uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 4). 110

Explanation:

POP3 uses port 110.

Ref: Computer Networking: A Top-Down Approach – Kurose and Ross

63. DNS stands for

- 1). Domain Name System
- 2). Data Name System
- 3). Digital Name System
- 4). Domain Network System

☒ Correct Answer: 1). Domain Name System

Explanation:

DNS converts domain names into IP addresses.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

64. DNS translates

- 1). IP to MAC
- 2). Domain name to IP address
- 3). Port to protocol
- 4). Packet to frame

☒ Correct Answer: 2). Domain name to IP address

Explanation:

DNS resolves human-readable domain names.

Ref: Computer Networks – Andrew S. Tanenbaum

65. FTP stands for

- 1). File Transfer Protocol
- 2). Fast Transfer Protocol
- 3). File Transmission Process
- 4). File Transport Protocol

☒ Correct Answer: 1). File Transfer Protocol

Explanation:

FTP transfers files between computers.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

66. Proxy server acts as

- 1). Client
- 2). Intermediary between client and server
- 3). Router
- 4). Switch

✓ Correct Answer: 2). Intermediary between client and server

Explanation:

Proxy server forwards client requests to web servers.

Ref: Data Communications and Networking – Behrouz A. Forouzan

67. Web server stores

- 1). Web pages
- 2). Packets
- 3). Frames
- 4). Signals

✓ Correct Answer: 1). Web pages

Explanation:

Web servers host websites and serve HTTP requests.

Ref: Computer Networking: A Top-Down Approach – Kurose and Ross

68. HTTP stands for

- 1). Hyper Text Transfer Protocol
- 2). High Transfer Text Protocol
- 3). Hyper Transmission Text Protocol
- 4). High Text Transmission Protocol

✓ Correct Answer: 1). Hyper Text Transfer Protocol

Explanation:

HTTP transfers web pages over Internet.

Ref: Computer Networks – Andrew S. Tanenbaum

69. Socket represents

- 1). Network interface
- 2). Combination of IP address and port number
- 3). Network cable
- 4). Packet header

✓ Correct Answer: 2). Combination of IP address and port number

Explanation:

Socket uniquely identifies network communication endpoint.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

70. A port number identifies

- 1). Network device
- 2). Application process
- 3). IP address
- 4). Protocol

✓ Correct Answer: 2). Application process

Explanation:

Port numbers distinguish applications.

Ref: Computer Networks – Andrew S. Tanenbaum

71. UDP stands for

- 1). Universal Data Protocol
- 2). User Datagram Protocol
- 3). Unified Data Protocol
- 4). User Data Program

✓ Correct Answer: 2). User Datagram Protocol

Explanation:

UDP is a connectionless transport layer protocol that provides fast but unreliable communication.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

72. TCP differs from UDP because TCP

- 1). Is faster
- 2). Provides reliable communication
- 3). Uses fewer headers
- 4). Uses no ports

✓ Correct Answer: 2). Provides reliable communication

Explanation:

TCP ensures reliable data delivery using acknowledgments and retransmissions.

Ref: Computer Networks – Andrew S. Tanenbaum and David J. Wetherall

73. The transport layer in TCP/IP model is responsible for

- 1). Routing
- 2). Error control and flow control
- 3). Signal transmission
- 4). Encryption

✓ Correct Answer: 2). Error control and flow control

Explanation:

Transport layer ensures reliable communication between hosts.

Ref: Data Communications and Networking – Behrouz A. Forouzan

74. IP addressing belongs to which OSI layer

- 1). Data link layer
- 2). Network layer
- 3). Transport layer
- 4). Session layer

✓ Correct Answer: 2). Network layer

Explanation:

Network layer is responsible for logical addressing and routing.

Ref: Data and Computer Communications – William Stallings

75. The device used to connect two networks is

- 1). Switch
- 2). Router
- 3). Repeater
- 4). Hub

✓ Correct Answer: 2). Router

Explanation:

Routers connect multiple networks and route packets between them.

Ref: Computer Networking: A Top-Down Approach – Kurose and Ross

76. A hub operates at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 1). Physical layer

Explanation:

Hubs simply repeat signals without processing frames.

Ref: Computer Networks – Andrew S. Tanenbaum

77. A switch operates at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 2). Data link layer

Explanation:

Switches forward frames using MAC addresses.

Ref: Data Communications and Networking – Behrouz A. Forouzan

78. The MAC address belongs to

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 2). Data link layer

Explanation:

MAC addresses uniquely identify devices in LAN.

Ref: Computer Networks – Andrew S. Tanenbaum

79. The protocol used to assign IP addresses dynamically is

- 1). DNS
- 2). DHCP
- 3). FTP
- 4). SMTP

✓ Correct Answer: 2). DHCP

Explanation:

Dynamic Host Configuration Protocol assigns IP addresses automatically.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

80. DNS server mainly performs

- 1). File transfer
- 2). Email transfer
- 3). Name resolution
- 4). Packet switching

✓ Correct Answer: 3). Name resolution

Explanation:

DNS converts domain names into IP addresses.

Ref: Computer Networks – Andrew S. Tanenbaum

81. SMTP protocol is used for

- 1). Sending email
- 2). Receiving email
- 3). File transfer
- 4). Web browsing

✓ Correct Answer: 1). Sending email

Explanation:

SMTP handles outgoing mail.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

82. POP protocol is used for

- 1). Sending emails
- 2). Receiving emails
- 3). Web browsing
- 4). File transfer

✓ Correct Answer: 2). Receiving emails

Explanation:

POP retrieves emails from server to client.

Ref: Computer Networking: A Top-Down Approach – Kurose and Ross

83. FTP protocol is mainly used for

- 1). File transfer
- 2). Email communication
- 3). Network routing
- 4). Packet switching

✓ Correct Answer: 1). File transfer

Explanation:

FTP transfers files between computers over networks.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

84. In networking, bandwidth refers to

- 1). Data transfer rate
- 2). Cable thickness
- 3). Signal strength
- 4). Packet size

✓ Correct Answer: 1). Data transfer rate

Explanation:

Bandwidth measures amount of data transmitted per second.

Ref: Data Communications and Networking – Behrouz A. Forouzan

85. Latency in networks refers to

- 1). Data transfer rate
- 2). Delay in data transmission
- 3). Packet size
- 4). Network topology

✓ Correct Answer: 2). Delay in data transmission

Explanation:

Latency is the time taken for data to travel from source to destination.

Ref: Computer Networks – Andrew S. Tanenbaum

86. In packet switching, packets travel

- 1). Through fixed path
- 2). Independently through network
- 3). Only in one direction
- 4). Through central node only

✓ Correct Answer: 2). Independently through network

Explanation:

Packets may take different routes and reassemble at destination.

Ref: Data Communications and Networking – Behrouz A. Forouzan

87. The protocol used for secure web communication is

- 1). HTTP
- 2). HTTPS
- 3). FTP
- 4). SMTP

✓ Correct Answer: 2). HTTPS

Explanation:

HTTPS uses encryption (SSL/TLS) for secure communication.

Ref: Computer Networking: A Top-Down Approach – Kurose and Ross

88. IPv4 address length is

- 1). 16 bits
- 2). 32 bits
- 3). 64 bits
- 4). 128 bits

✓ Correct Answer: 2). 32 bits

Explanation:

IPv4 addresses consist of 32 bits divided into four octets.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

89. IPv6 address length is

- 1). 32 bits
- 2). 64 bits
- 3). 128 bits
- 4). 256 bits

✓ Correct Answer: 3). 128 bits

Explanation:

IPv6 expands address space to 128 bits.

Ref: Computer Networks – Andrew S. Tanenbaum

90. Gateway in networking is

- 1). Network router
- 2). Protocol converter
- 3). Data switch
- 4). Signal amplifier

✓ Correct Answer: 2). Protocol converter

Explanation:

Gateways connect networks using different protocols.

Ref: Data Communications and Networking – Behrouz A. Forouzan

91. Network congestion occurs when

- 1). Too few packets
- 2). Too many packets in network
- 3). Low bandwidth
- 4). High bandwidth

✓ Correct Answer: 2). Too many packets in network

Explanation:

Congestion occurs when network traffic exceeds capacity.

Ref: Computer Networks – Andrew S. Tanenbaum

92. LAN stands for

- 1). Local Area Network
- 2). Large Area Network
- 3). Logical Area Network
- 4). Link Area Network

✓ Correct Answer: 1). Local Area Network

Explanation:

LAN connects devices in a limited geographical area.

Ref: Data Communications and Networking – Behrouz A. Forouzan

93. The protocol used for remote login is

- 1). FTP
- 2). Telnet
- 3). SMTP
- 4). POP

✓ Correct Answer: 2). Telnet

Explanation:

Telnet allows remote access to another computer.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

94. Network protocol defines

- 1). Hardware connections
- 2). Rules for communication
- 3). Signal strength
- 4). Cable type

✓ Correct Answer: 2). Rules for communication

Explanation:

Protocols specify standards for communication between devices.

Ref: Computer Networks – Andrew S. Tanenbaum

95. A web browser communicates with web server using

- 1). FTP
- 2). HTTP
- 3). SMTP
- 4). POP

✓ Correct Answer: 2). HTTP

Explanation:

HTTP transfers web pages between browser and server.

Ref: Computer Networking: A Top-Down Approach – Kurose and Ross

96. Proxy server improves

- 1). Security and caching
- 2). Network cables
- 3). Signal frequency
- 4). Packet size

✓ Correct Answer: 1). Security and caching

Explanation:

Proxy servers cache data and filter traffic.

Ref: Data Communications and Networking – Behrouz A. Forouzan

97. Web server responds to requests using

- 1). FTP
- 2). HTTP
- 3). SMTP
- 4). POP

✓ Correct Answer: 2). HTTP

Explanation:

HTTP protocol is used for web communication.

Ref: Computer Networks – Andrew S. Tanenbaum

98. The Internet is an example of

- 1). LAN
- 2). WAN
- 3). PAN
- 4). MAN

✓ Correct Answer: 2). WAN

Explanation:

Internet connects networks globally.

Ref: Data Communications and Networking – Behrouz A. Forouzan

99. Network topology refers to

- 1). Physical arrangement of network devices
- 2). Network protocol
- 3). Data rate
- 4). Transmission media

☒ Correct Answer: 1). Physical arrangement of network devices

Explanation:

Topology defines network layout.

Ref: Computer Networks – Andrew S. Tanenbaum

100. The main goal of computer networking is

- 1). Data storage
- 2). Resource sharing and communication
- 3). Signal amplification
- 4). Signal generation

☒ Correct Answer: 2). Resource sharing and communication

Explanation:

Networking enables communication and resource sharing between computers.

Ref: Data Communications and Networking – Behrouz A. Forouzan

Most Repeated PYQ AP ECET Questions – Top 200**1. The barrier potential of a silicon diode at room temperature is**

- 1). 0.2 V
- 2). 0.3 V
- 3). 0.7 V
- 4). 1.5 V

☒ Correct Answer: 3). 0.7 V

Explanation:

Silicon PN junction requires about 0.7 V to overcome the potential barrier.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

2. The barrier potential of germanium diode is

- 1). 0.1 V
- 2). 0.3 V
- 3). 0.7 V
- 4). 1 V

☒ Correct Answer: 2). 0.3 V

Explanation:

Germanium diodes have lower barrier potential than silicon.

Ref: Electronic Devices and Circuits – David A. Bell

3. Zener diode is mainly used for

- 1). Amplification
- 2). Voltage regulation
- 3). Oscillation
- 4). Detection

☒ Correct Answer: 2). Voltage regulation

Explanation:

Zener diode maintains constant voltage in breakdown region.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

4. The transistor configuration having highest current gain is

- 1). CB
- 2). CE
- 3). CC
- 4). Common source

☒ Correct Answer: 2). CE

Explanation:

CE configuration provides high current and voltage gain.

Ref: Electronic Principles – Albert Malvino and David A. Bates

5. In CE amplifier the phase shift between input and output is

- 1). 0°
- 2). 90°
- 3). 180°
- 4). 360°

☒ Correct Answer: 3). 180°

Explanation:

CE amplifier produces phase inversion.

Ref: Electronic Devices and Circuits – David A. Bell

6. Efficiency of full wave rectifier is

- 1). 40.6%
- 2). 50%
- 3). 81.2%
- 4). 100%

☒ Correct Answer: 3). 81.2%

Explanation:

Theoretical maximum efficiency of full wave rectifier.

Ref: Electronic Devices and Circuit Theory – Boylestad

7. A FET is a

- 1). Current controlled device
- 2). Voltage controlled device
- 3). Power controlled device
- 4). Frequency controlled device

☒ Correct Answer: 2). Voltage controlled device

Explanation:

Gate voltage controls channel current.

Ref: Electronic Devices and Circuits – Millman and Halkias

8. The transistor configuration having highest input impedance is

- 1). CB
- 2). CE
- 3). CC
- 4). Common source

☒ Correct Answer: 3). CC

Explanation:

Emitter follower provides high input impedance.

Ref: Electronic Principles – Malvino

9. Differential amplifier amplifies

- 1). Average signal
- 2). Difference between signals
- 3). Sum of signals
- 4). Square of signals

☒ Correct Answer: 2). Difference between signals

Explanation:

Differential amplifier amplifies difference of two inputs.

Ref: Microelectronic Circuits – Sedra and Smith

10. Ideal op-amp input impedance is

- 1). Zero
- 2). Low
- 3). Infinite
- 4). Moderate

✓ Correct Answer: 3). Infinite

Explanation:

Ideal op-amp draws zero input current.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

11. Ideal op-amp output impedance is

- 1). Infinite
- 2). Very high
- 3). Zero
- 4). Moderate

✓ Correct Answer: 3). Zero

Explanation:

Ideal op-amp behaves like ideal voltage source.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

12. Crystal oscillator provides

- 1). High gain
- 2). High stability
- 3). Low frequency
- 4). Low cost

✓ Correct Answer: 2). High stability

Explanation:

Quartz crystal maintains constant frequency.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

13. Astable multivibrator has

- 1). One stable state
- 2). Two stable states
- 3). No stable state
- 4). Infinite states

✓ Correct Answer: 3). No stable state

Explanation:

Astable circuit oscillates continuously.

Ref: Pulse and Digital Circuits – A. Anand Kumar

14. Schmitt trigger is used for

- 1). Amplification
- 2). Wave shaping
- 3). Rectification
- 4). Detection

✓ Correct Answer: 2). Wave shaping

Explanation:

Schmitt trigger converts noisy signals into square waves.

Ref: Pulse, Digital and Switching Waveforms – Millman and Taub

15. AM bandwidth equals

- 1). f_m
- 2). $2f_m$
- 3). f_c
- 4). $2f_c$

✓ Correct Answer: 2). $2f_m$

Explanation:

AM has two sidebands.

Ref: Electronic Communication Systems – George Kennedy

16. In superheterodyne receiver the IF frequency for AM is

- 1). 100 kHz
- 2). 455 kHz
- 3). 10.7 MHz
- 4). 1 MHz

✓ Correct Answer: 2). 455 kHz

Explanation:

Standard IF frequency for AM receivers.

Ref: Electronic Communication Systems – George Kennedy

17. PCM stands for

- 1). Pulse Carrier Modulation
- 2). Pulse Code Modulation
- 3). Phase Code Modulation
- 4). Pulse Current Modulation

✓ Correct Answer: 2). Pulse Code Modulation

Explanation:

PCM converts analog signal to digital form.

Ref: Digital Communications – Sanjay Sharma

18. ASK stands for

- 1). Amplitude Shift Keying
- 2). Analog Signal Keying
- 3). Amplitude Signal Keying
- 4). Automatic Signal Keying

✓ Correct Answer: 1). Amplitude Shift Keying

Explanation:

Digital data modulates amplitude of carrier.

Ref: Digital Communications – Sanjay Sharma

19. Radar stands for

- 1). Radio Detection and Ranging
- 2). Radio Direction and Range
- 3). Radio Data and Range
- 4). Radio Detection and Radio

✓ Correct Answer: 1). Radio Detection and Ranging

Explanation:

Radar determines position of objects using radio waves.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

20. Optical fiber communication works on

- 1). Reflection
- 2). Refraction
- 3). Total internal reflection
- 4). Diffraction

✓ Correct Answer: 3). Total internal reflection

Explanation:

Light confined inside fiber core.

Ref: Optical Fiber Communications – Gerd Keiser

21. The binary equivalent of decimal number 13 is

- 1). 1010
- 2). 1011
- 3). 1101
- 4). 1110

✓ Correct Answer: 3). 1101

Explanation:

$13 = 8 + 4 + 1 \rightarrow (1101)_2$.

Ref: Digital Fundamentals – Thomas L. Floyd

22. The hexadecimal equivalent of decimal 15 is

- 1). A
- 2). B
- 3). E
- 4). F

☒ Correct Answer: 4). F

Explanation:

Hexadecimal system uses digits 0–9 and A–F.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

23. NAND gate is called

- 1). Exclusive gate
- 2). Universal gate
- 3). Buffer gate
- 4). Basic gate

☒ Correct Answer: 2). Universal gate

Explanation:

All logic gates can be implemented using NAND gates.

Ref: Modern Digital Electronics – R.P. Jain

24. NOR gate is also called

- 1). Universal gate
- 2). Exclusive gate
- 3). Buffer gate
- 4). Basic gate

☒ Correct Answer: 1). Universal gate

Explanation:

NOR gate can implement any logic circuit.

Ref: Modern Digital Electronics – R.P. Jain

25. A half adder adds

- 1). Two bits
- 2). Three bits
- 3). Four bits
- 4). Two bits and carry

☒ Correct Answer: 1). Two bits

Explanation:

Half adder adds two binary digits.

Ref: Digital Design – M. Morris Mano

26. A full adder adds

- 1). Two bits
- 2). Three bits
- 3). Four bits
- 4). Two bits only

☒ Correct Answer: 2). Three bits

Explanation:

Inputs are A, B and Carry-in.

Ref: Digital Design – M. Morris Mano

27. MOD-8 counter requires

- 1). 2 flip-flops
- 2). 3 flip-flops
- 3). 4 flip-flops
- 4). 5 flip-flops

☒ Correct Answer: 2). 3 flip-flops

Explanation:

$2^3 = 8$ states.

Ref: Modern Digital Electronics – R.P. Jain

28. A 4-variable K-map contains

- 1). 8 cells
- 2). 12 cells
- 3). 16 cells
- 4). 32 cells

✓ Correct Answer: 3). 16 cells

Explanation:

Cells = 2^4 .

Ref: Fundamentals of Digital Circuits – A. Anand Kumar

29. SRAM stores data using

- 1). Capacitors
- 2). Flip-flops
- 3). Resistors
- 4). Inductors

✓ Correct Answer: 2). Flip-flops

Explanation:

SRAM uses bistable latches.

Ref: Digital Electronics – Anil K. Maini

30. DRAM stores data using

- 1). Capacitors
- 2). Flip-flops
- 3). Inductors
- 4). Resistors

✓ Correct Answer: 1). Capacitors

Explanation:

Charge stored in capacitors represents binary data.

Ref: Digital Electronics – Anil K. Maini

31. The accumulator in 8051 is

- 1). Register A
- 2). Register B
- 3). Register C
- 4). Register D

☒ Correct Answer: 1). Register A

Explanation:

Most arithmetic operations occur in accumulator.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

32. Default stack pointer value in 8051 is

- 1). 00H
- 2). 07H
- 3). 10H
- 4). FFH

☒ Correct Answer: 2). 07H

Explanation:

Stack begins after register bank.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

33. Machine cycle of 8051 consists of

- 1). 6 clock cycles
- 2). 12 clock cycles
- 3). 24 clock cycles
- 4). 48 clock cycles

☒ Correct Answer: 2). 12 clock cycles

Explanation:

One machine cycle = 12 oscillator cycles.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

34. Bluetooth operates in

- 1). 900 MHz band
- 2). 2.4 GHz band
- 3). 5 GHz band
- 4). 10 GHz band

✓ Correct Answer: 2). 2.4 GHz band

Explanation:

Bluetooth uses ISM band.

Ref: Data Communications and Networking – Behrouz A. Forouzan

35. WLAN standard is

- 1). IEEE 802.3
- 2). IEEE 802.5
- 3). IEEE 802.11
- 4). IEEE 802.15

✓ Correct Answer: 3). IEEE 802.11

Explanation:

IEEE 802.11 defines wireless LAN.

Ref: Computer Networking – Kurose and Ross

36. DNS is used for

- 1). File transfer
- 2). Email transfer
- 3). Domain name translation
- 4). Error detection

✓ Correct Answer: 3). Domain name translation

Explanation:

DNS converts domain name to IP address.

Ref: Computer Networks – Andrew S. Tanenbaum

37. FTP uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 1). 21

Explanation:

FTP control port is 21.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

38. SMTP protocol is used for

- 1). Sending email
- 2). Receiving email
- 3). File transfer
- 4). Web browsing

☒ Correct Answer: 1). Sending email

Explanation:

SMTP transfers outgoing mail.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

39. POP3 protocol is used for

- 1). Sending email
- 2). Receiving email
- 3). Web browsing
- 4). File transfer

☒ Correct Answer: 2). Receiving email

Explanation:

POP3 retrieves mail from server.

Ref: Computer Networking – Kurose and Ross

40. HTTP protocol transfers

- 1). Files
- 2). Web pages
- 3). Emails
- 4). Packets

✓ Correct Answer: 2). Web pages

Explanation:

HTTP transfers hypertext documents.

Ref: Computer Networks – Andrew S. Tanenbaum

41. In a mesh analysis method the basic law applied is

- 1). Kirchhoff's Current Law
- 2). Kirchhoff's Voltage Law
- 3). Ohm's Law
- 4). Faraday's Law

✓ Correct Answer: 2). Kirchhoff's Voltage Law

Explanation:

Mesh analysis applies KVL around closed loops to calculate loop currents.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

42. In nodal analysis the governing law used is

- 1). KVL
- 2). KCL
- 3). Ohm's Law
- 4). Coulomb's Law

✓ Correct Answer: 2). KCL

Explanation:

Nodal analysis uses Kirchhoff's Current Law at nodes.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

43. Thevenin voltage is equal to

- 1). Short circuit voltage
- 2). Open circuit voltage
- 3). RMS voltage
- 4). Average voltage

☒ Correct Answer: 2). Open circuit voltage

Explanation:

Thevenin voltage equals the open-circuit terminal voltage.

Ref: Network Analysis – M.E. Van Valkenburg

44. Norton equivalent current equals

- 1). Open circuit current
- 2). Short circuit current
- 3). RMS current
- 4). Average current

☒ Correct Answer: 2). Short circuit current

Explanation:

Norton current is the current through the shorted terminals.

Ref: Network Analysis – M.E. Van Valkenburg

45. Maximum power transfer occurs when

- 1). $R_L = 0$
- 2). $R_L = R_{th}$
- 3). $R_L = 2R_{th}$
- 4). $R_L = R_{th}/2$

☒ Correct Answer: 2). $R_L = R_{th}$

Explanation:

Maximum power delivered when load resistance equals Thevenin resistance.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

46. Q-factor of resonant circuit indicates

- 1). Voltage gain
- 2). Selectivity
- 3). Current gain
- 4). Power factor

✓ Correct Answer: 2). Selectivity

Explanation:

Higher Q means sharper resonance and better selectivity.

Ref: Circuits and Networks – A. Sudhakar and Shyammohan S. Palli

47. Bandwidth of resonant circuit equals

- 1). $f_r \times Q$
- 2). f_r / Q
- 3). Q / f_r
- 4). f_r^2 / Q

✓ Correct Answer: 2). f_r / Q

Explanation:

Bandwidth is inversely proportional to Q-factor.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

48. Time constant of RC circuit equals

- 1). R/C
- 2). RC
- 3). $1/RC$
- 4). $\sqrt{RC}$

✓ Correct Answer: 2). RC

Explanation:

Time constant determines exponential charging and discharging.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

49. Time constant of RL circuit equals

- 1). R/L
- 2). L/R
- 3). LR
- 4). $\sqrt{LR}$

✓ Correct Answer: 2). L/R

Explanation:

RL time constant equals inductance divided by resistance.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

50. Characteristic impedance of transmission line equals

- 1). $\sqrt{L/C}$
- 2). $\sqrt{C/L}$
- 3). L/C
- 4). C/L

✓ Correct Answer: 1). $\sqrt{L/C}$

Explanation:

Characteristic impedance depends on inductance and capacitance per unit length.

Ref: Networks, Lines and Fields – John D. Ryder

51. Standing Wave Ratio indicates

- 1). Signal frequency
- 2). Signal voltage
- 3). Impedance mismatch
- 4). Signal amplitude

✓ Correct Answer: 3). Impedance mismatch

Explanation:

SWR measures reflections in transmission lines.

Ref: Networks, Lines and Fields – John D. Ryder

52. CRO is mainly used to

- 1). Measure resistance
- 2). Display waveform
- 3). Measure power
- 4). Measure inductance

☒ Correct Answer: 2). Display waveform

Explanation:

Oscilloscope displays voltage signals graphically.

Ref: Electronic Instrumentation – H.S. Kalsi

53. Horizontal deflection in CRO is produced by

- 1). Vertical amplifier
- 2). Time base generator
- 3). Trigger circuit
- 4). Power supply

☒ Correct Answer: 2). Time base generator

Explanation:

Time base produces horizontal sweep.

Ref: Electronic Devices and Circuits – David A. Bell

54. Dual slope ADC works on

- 1). Binary search
- 2). Integration principle
- 3). Parallel comparison
- 4). Counting method

☒ Correct Answer: 2). Integration principle

Explanation:

Integrates input signal then reference voltage.

Ref: Electronic Instrumentation – H.S. Kalsi

55. Successive approximation ADC uses

- 1). Binary search algorithm
- 2). Parallel conversion
- 3). Ramp conversion
- 4). Random conversion

☒ Correct Answer: 1). Binary search algorithm

Explanation:

Determines digital output bit by bit.

Ref: Electronic Instrumentation – H.S. Kalsi

56. SCR belongs to

- 1). Diode family
- 2). Transistor family
- 3). Thyristor family
- 4). FET family

☒ Correct Answer: 3). Thyristor family

Explanation:

SCR is a four-layer PNPN device.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

57. TRIAC conducts

- 1). Only positive half cycle
- 2). Only negative half cycle
- 3). Both directions
- 4). No direction

☒ Correct Answer: 3). Both directions

Explanation:

TRIAC controls AC power.

Ref: Power Electronics – P.S. Bimbhra

58. IGBT combines features of

- 1). BJT and MOSFET
- 2). SCR and diode
- 3). FET and diode
- 4). BJT and SCR

☒ Correct Answer: 1). BJT and MOSFET

Explanation:

High input impedance and high current capability.

Ref: Power Electronics – Muhammad H. Rashid

59. LDR resistance

- 1). Increases with light
- 2). Decreases with light
- 3). Remains constant
- 4). Becomes infinite

☒ Correct Answer: 2). Decreases with light

Explanation:

Light generates charge carriers.

Ref: Electronic Devices and Circuit Theory – Boylestad

60. LVDT measures

- 1). Pressure
- 2). Temperature
- 3). Linear displacement
- 4). Voltage

☒ Correct Answer: 3). Linear displacement

Explanation:

LVDT converts displacement to voltage.

Ref: A Course in Electrical and Electronic Measurements – A.K. Sawhney

61. Thermocouple works on

- 1). Hall effect
- 2). Seebeck effect
- 3). Photoelectric effect
- 4). Faraday effect

☒ Correct Answer: 2). Seebeck effect

Explanation:

A thermocouple generates voltage when two junctions are at different temperatures.

Ref: A Course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney

62. Ultrasonic waves have frequency

- 1). Below 20 Hz
- 2). Below 20 kHz
- 3). Above 20 kHz
- 4). Above 1 MHz

☒ Correct Answer: 3). Above 20 kHz

Explanation:

Ultrasonic waves have frequencies above the audible range of humans.

Ref: Industrial Electronics – G.K. Mithal

63. Ultrasonic flaw detector is used for

- 1). Temperature measurement
- 2). Voltage measurement
- 3). Detecting internal cracks
- 4). Measuring pressure

☒ Correct Answer: 3). Detecting internal cracks

Explanation:

Pulse echo technique is used in ultrasonic testing.

Ref: Industrial Electronics – G.K. Mithal

64. Induction heating works on

- 1). Electrostatic field
- 2). Eddy currents
- 3). Direct current
- 4). Capacitive current

✓ Correct Answer: 2). Eddy currents

Explanation:

Alternating magnetic field induces eddy currents producing heat.

Ref: Industrial Electronics – G.K. Mithal

65. Transfer function of control system is

- 1). Input / Output
- 2). Output / Input
- 3). Voltage / Current
- 4). Current / Voltage

✓ Correct Answer: 2). Output / Input

Explanation:

Defined as ratio of output to input in Laplace domain.

Ref: Control Systems Engineering – I.J. Nagrath and M. Gopal

66. Closed loop control system has

- 1). No feedback
- 2). Feedback
- 3). Oscillator
- 4). Amplifier

✓ Correct Answer: 2). Feedback

Explanation:

Output is fed back to input for control.

Ref: Control Systems – A. Anand Kumar

67. Open loop control system has

- 1). Feedback
- 2). No feedback
- 3). Amplifier
- 4). Oscillator

✓ Correct Answer: 2). No feedback

Explanation:

Output does not influence input.

Ref: Control Systems – A. Anand Kumar

68. Radar range equation determines

- 1). Maximum detection range
- 2). Frequency of radar
- 3). Voltage of radar
- 4). Current of radar

✓ Correct Answer: 1). Maximum detection range

Explanation:

Radar equation determines maximum detectable distance.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

69. Dominant mode in rectangular waveguide is

- 1). TE₀₁
- 2). TE₁₀
- 3). TM₁₀
- 4). TM₀₁

✓ Correct Answer: 2). TE₁₀

Explanation:

TE₁₀ has lowest cutoff frequency.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

70. Parabolic reflector antenna provides

- 1). Low gain
- 2). Medium gain
- 3). High gain
- 4). No gain

☒ Correct Answer: 3). High gain

Explanation:

Parabolic reflector concentrates electromagnetic waves.

Ref: Antennas and Wave Propagation – John D. Kraus

71. Optical fiber communication works on

- 1). Reflection
- 2). Refraction
- 3). Total internal reflection
- 4). Diffraction

☒ Correct Answer: 3). Total internal reflection

Explanation:

Light signals travel inside fiber core due to total internal reflection.

Ref: Optical Fiber Communications – Gerd Keiser

72. Single mode fiber is used for

- 1). Short distance communication
- 2). Long distance communication
- 3). Low frequency communication
- 4). Audio communication

☒ Correct Answer: 2). Long distance communication

Explanation:

Single mode fiber has low dispersion.

Ref: Optical Fiber Communications – Gerd Keiser

73. GSM system uses

- 1). FDMA
- 2). TDMA
- 3). CDMA
- 4). OFDM

☒ Correct Answer: 2). TDMA

Explanation:

GSM uses time division multiple access.

Ref: Wireless Communications – Theodore S. Rappaport

74. CDMA stands for

- 1). Code Division Multiple Access
- 2). Carrier Division Multiple Access
- 3). Channel Division Multiple Access
- 4). Communication Division Multiple Access

☒ Correct Answer: 1). Code Division Multiple Access

Explanation:

Multiple users share same frequency band using codes.

Ref: Wireless Communications – Theodore S. Rappaport

75. Shannon capacity formula is

- 1). $C = B \log_2(1 + S/N)$
- 2). $C = B + S/N$
- 3). $C = S/N$
- 4). $C = B \log(S/N)$

☒ Correct Answer: 1). $C = B \log_2(1 + S/N)$

Explanation:

Defines maximum data transmission rate.

Ref: Data Communications and Networking – Behrouz A. Forouzan

76. OSI model contains

- 1). 5 layers
- 2). 6 layers
- 3). 7 layers
- 4). 8 layers

✓ Correct Answer: 3). 7 layers

Explanation:

OSI model standardizes network communication.

Ref: Computer Networks – Andrew S. Tanenbaum

77. Physical layer deals with

- 1). Routing
- 2). Bit transmission
- 3). Encryption
- 4). Error detection

✓ Correct Answer: 2). Bit transmission

Explanation:

Handles raw bit transmission over medium.

Ref: Data Communications and Networking – Forouzan

78. Data link layer handles

- 1). Routing
- 2). Error detection
- 3). Signal generation
- 4). Compression

✓ Correct Answer: 2). Error detection

Explanation:

Ensures reliable frame transmission.

Ref: Computer Networks – Andrew S. Tanenbaum

79. Network layer performs

- 1). Routing
- 2). Encryption
- 3). Signal amplification
- 4). Compression

✓ Correct Answer: 1). Routing

Explanation:

Determines path of packets.

Ref: Data Communications and Networking – Forouzan

80. Transport layer provides

- 1). Reliable communication
- 2). Signal amplification
- 3). Frequency control
- 4). Voltage regulation

✓ Correct Answer: 1). Reliable communication

Explanation:

Provides end-to-end communication between systems.

Ref: Computer Networking – Kurose and Ross

81. Application layer of OSI model provides

- 1). Routing services
- 2). User interface to network
- 3). Error detection
- 4). Bit transmission

✓ Correct Answer: 2). User interface to network

Explanation:

Application layer provides services directly to user applications like email and file transfer.

Ref: Data Communications and Networking – Behrouz A. Forouzan

82. Bus topology uses

- 1). Central hub
- 2). Backbone cable
- 3). Circular connection
- 4). Mesh connection

✓ Correct Answer: 2). Backbone cable

Explanation:

All nodes connect to a single backbone cable.

Ref: Computer Networks – Andrew S. Tanenbaum

83. Star topology uses

- 1). Backbone cable
- 2). Central hub
- 3). Ring connection
- 4). Mesh network

✓ Correct Answer: 2). Central hub

Explanation:

All devices connect to a central hub or switch.

Ref: Data Communications and Networking – Behrouz A. Forouzan

84. Ring topology connects nodes

- 1). Randomly
- 2). In circular loop
- 3). Through hub
- 4). Through backbone cable

✓ Correct Answer: 2). In circular loop

Explanation:

Each node connects to two neighbors forming a ring.

Ref: Computer Networks – Andrew S. Tanenbaum

85. Packet switching transmits data as

- 1). Frames
- 2). Packets
- 3). Signals
- 4). Waves

✓ Correct Answer: 2). Packets

Explanation:

Data is divided into smaller packets for transmission.

Ref: Data Communications and Networking – Behrouz A. Forouzan

86. Frame Relay is a

- 1). Circuit switching technique
- 2). Packet switching technique
- 3). Optical communication technique
- 4). Satellite communication technique

✓ Correct Answer: 2). Packet switching technique

Explanation:

Frame Relay uses packet switching for faster data transfer.

Ref: Data and Computer Communications – William Stallings

87. ATM cell size is

- 1). 48 bytes
- 2). 53 bytes
- 3). 64 bytes
- 4). 128 bytes

✓ Correct Answer: 2). 53 bytes

Explanation:

ATM cell consists of 48-byte payload and 5-byte header.

Ref: Data and Computer Communications – William Stallings

88. Router operates at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 3). Network layer

Explanation:

Router forwards packets using IP address.

Ref: Computer Networks – Andrew S. Tanenbaum

89. Switch operates at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 2). Data link layer

Explanation:

Switch uses MAC address to forward frames.

Ref: Data Communications and Networking – Behrouz A. Forouzan

90. Hub operates at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 1). Physical layer

Explanation:

Hub repeats incoming signals to all ports.

Ref: Computer Networks – Andrew S. Tanenbaum

91. IPv4 address length is

- 1). 16 bits
- 2). 32 bits
- 3). 64 bits
- 4). 128 bits

☒ Correct Answer: 2). 32 bits

Explanation:

IPv4 uses 32-bit addressing scheme.

Ref: Data Communications and Networking – Behrouz A. Forouzan

92. IPv6 address length is

- 1). 32 bits
- 2). 64 bits
- 3). 128 bits
- 4). 256 bits

☒ Correct Answer: 3). 128 bits

Explanation:

IPv6 expands address space significantly.

Ref: Computer Networks – Andrew S. Tanenbaum

93. HTTP protocol uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 3). 80

Explanation:

HTTP transfers web pages using port 80.

Ref: Computer Networking – Kurose and Ross

94. SMTP protocol uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 2). 25

Explanation:

SMTP is used for sending email.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

95. POP3 protocol uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 4). 110

Explanation:

POP3 retrieves emails from server.

Ref: Computer Networking – Kurose and Ross

96. FTP protocol uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 1). 21

Explanation:

FTP transfers files between computers.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

97. DNS is used to

- 1). Transfer files
- 2). Translate domain names
- 3). Send emails
- 4). Detect errors

☒ Correct Answer: 2). Translate domain names

Explanation:

DNS converts domain names into IP addresses.

Ref: Computer Networks – Andrew S. Tanenbaum

98. Bluetooth network is called

- 1). Subnet
- 2). Piconet
- 3). Cluster
- 4). Mesh

☒ Correct Answer: 2). Piconet

Explanation:

Bluetooth devices form a small network called piconet.

Ref: Data Communications and Networking – Behrouz A. Forouzan

99. Internet is an example of

- 1). LAN
- 2). WAN
- 3). PAN
- 4). MAN

☒ Correct Answer: 2). WAN

Explanation:

Internet connects networks globally.

Ref: Computer Networks – Andrew S. Tanenbaum

100. The main purpose of networking is

- 1). Data storage
- 2). Resource sharing
- 3). Signal amplification
- 4). Signal generation

☒ Correct Answer: 2). Resource sharing

Explanation:

Networking allows sharing of information and devices.

Ref: Data Communications and Networking – Behrouz A. Forouzan

101. A PN junction diode conducts current mainly due to

- 1). Majority carriers
- 2). Minority carriers
- 3). Both carriers equally
- 4). Electric field only

☒ Correct Answer: 1). Majority carriers

Explanation:

In forward bias, current in a PN junction diode is mainly due to majority carriers.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

102. Reverse saturation current in a diode mainly depends on

- 1). Applied voltage
- 2). Temperature
- 3). Load resistance
- 4). Frequency

☒ Correct Answer: 2). Temperature

Explanation:

Reverse saturation current increases significantly with temperature.

Ref: Electronic Devices and Circuits – David A. Bell

103. Zener diode breakdown occurs due to

- 1). Avalanche effect
- 2). Zener effect
- 3). Both avalanche and Zener effects
- 4). Diffusion

☒ Correct Answer: 3). Both avalanche and Zener effects

Explanation:

Breakdown occurs due to Zener effect at low voltages and avalanche effect at higher voltages.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

104. Current gain in common emitter configuration is

- 1). α
- 2). β
- 3). γ
- 4). δ

☒ Correct Answer: 2). β

Explanation:

β represents current gain in CE configuration.

Ref: Electronic Principles – Albert Malvino and David J. Bates

105. The transistor configuration with lowest input impedance is

- 1). CB
- 2). CE
- 3). CC
- 4). CS

☒ Correct Answer: 1). CB

Explanation:

Common base configuration has very low input impedance.

Ref: Electronic Devices and Circuit Theory – Boylestad

106. Transformer coupled amplifiers are mainly used in

- 1). RF amplifiers
- 2). Power amplifiers
- 3). Audio amplifiers
- 4). Oscillators

✓ Correct Answer: 2). Power amplifiers

Explanation:

Transformer coupling improves power transfer.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

107. Negative feedback in amplifier results in

- 1). Increased gain
- 2). Reduced distortion
- 3). Reduced bandwidth
- 4). Increased noise

✓ Correct Answer: 2). Reduced distortion

Explanation:

Negative feedback improves stability and reduces distortion.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

108. Operational amplifier works as

- 1). Differential amplifier
- 2). Power amplifier
- 3). RF amplifier
- 4). Oscillator

✓ Correct Answer: 1). Differential amplifier

Explanation:

Op-amp amplifies difference between two input signals.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

109. An RC oscillator produces

- 1). Square wave
- 2). Sinusoidal wave
- 3). Triangular wave
- 4). Sawtooth wave

☒ Correct Answer: 2). Sinusoidal wave

Explanation:

RC oscillators generate sinusoidal signals.

Ref: Electronic Principles – Malvino

110. Crystal oscillator is preferred because of

- 1). Low frequency
- 2). High stability
- 3). Low cost
- 4). Low gain

☒ Correct Answer: 2). High stability

Explanation:

Quartz crystal maintains precise frequency.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

111. AM modulation index is

- 1). V_m / V_c
- 2). V_c / V_m
- 3). f_m / f_c
- 4). f_c / f_m

☒ Correct Answer: 1). V_m / V_c

Explanation:

Ratio of modulating voltage to carrier voltage.

Ref: Electronic Communication Systems – George Kennedy

112. Bandwidth of AM signal equals

- 1). f_m
- 2). $2f_m$
- 3). f_c
- 4). $2f_c$

✓ Correct Answer: 2). $2f_m$

Explanation:

AM contains two sidebands.

Ref: Electronic Communication Systems – George Kennedy

113. FM modulation varies

- 1). Amplitude
- 2). Frequency
- 3). Phase
- 4). Power

✓ Correct Answer: 2). Frequency

Explanation:

Carrier frequency varies according to modulating signal.

Ref: Communication Systems – Simon Haykin

114. Superheterodyne receiver converts signal to

- 1). Lower intermediate frequency
- 2). Higher frequency
- 3). Audio frequency
- 4). Baseband frequency

✓ Correct Answer: 1). Lower intermediate frequency

Explanation:

Frequency conversion improves selectivity.

Ref: Electronic Communication Systems – George Kennedy

115. Sensitivity of receiver refers to

- 1). Ability to detect weak signals
- 2). Ability to reject noise
- 3). Ability to amplify signals
- 4). Ability to reduce distortion

☒ Correct Answer: 1). Ability to detect weak signals

Explanation:

Sensitivity indicates minimum detectable signal.

Ref: Electronic Communication Systems – George Kennedy

116. Selectivity of receiver refers to

- 1). Ability to detect weak signals
- 2). Ability to select desired signal
- 3). Ability to amplify signals
- 4). Ability to reduce distortion

☒ Correct Answer: 2). Ability to select desired signal

Explanation:

Receiver should reject unwanted frequencies.

Ref: Electronic Communication Systems – George Kennedy

117. Ground wave propagation occurs mainly in

- 1). VHF band
- 2). UHF band
- 3). LF and MF bands
- 4). Microwave band

☒ Correct Answer: 3). LF and MF bands

Explanation:

Ground waves follow earth surface.

Ref: Antennas and Wave Propagation – John D. Kraus

118. Sky wave propagation occurs due to

- 1). Reflection from earth
- 2). Reflection from ionosphere
- 3). Diffraction
- 4). Refraction from troposphere

☒ Correct Answer: 2). Reflection from ionosphere

Explanation:

Ionosphere reflects radio waves.

Ref: Antennas and Wave Propagation – K.D. Prasad

119. PCM system includes

- 1). Sampling
- 2). Quantization
- 3). Encoding
- 4). All of the above

☒ Correct Answer: 4). All of the above

Explanation:

PCM converts analog signals into digital form.

Ref: Digital Communications – Sanjay Sharma

120. Delta modulation is used for

- 1). Digital transmission
- 2). Analog transmission
- 3). Optical transmission
- 4). Satellite communication

☒ Correct Answer: 1). Digital transmission

Explanation:

Delta modulation converts analog signals to digital format.

Ref: Digital Communications – Sanjay Sharma

121. ASK stands for

- 1). Analog Shift Keying
- 2). Amplitude Shift Keying
- 3). Automatic Signal Keying
- 4). Analog Signal Keying

✓ Correct Answer: 2). Amplitude Shift Keying

Explanation:

ASK is a digital modulation technique where the amplitude of the carrier varies according to binary data.

Ref: Digital Communications – Sanjay Sharma

122. FSK stands for

- 1). Frequency Shift Keying
- 2). Fast Signal Keying
- 3). Frequency Signal Keying
- 4). Filter Signal Keying

✓ Correct Answer: 1). Frequency Shift Keying

Explanation:

FSK represents binary data by shifting carrier frequency.

Ref: Digital Communications – Sanjay Sharma

123. PSK stands for

- 1). Phase Shift Keying
- 2). Pulse Shift Keying
- 3). Power Shift Keying
- 4). Phase Signal Keying

✓ Correct Answer: 1). Phase Shift Keying

Explanation:

In PSK, phase of the carrier signal changes according to data.

Ref: Digital Communications – Sanjay Sharma

124. TDM stands for

- 1). Time Division Multiplexing
- 2). Transmission Division Multiplexing
- 3). Transfer Data Multiplexing
- 4). Time Data Modulation

☒ Correct Answer: 1). Time Division Multiplexing

Explanation:

Multiple signals share the same channel in different time slots.

Ref: Electronic Communication Systems – George Kennedy

125. FDM stands for

- 1). Frequency Division Modulation
- 2). Frequency Division Multiplexing
- 3). Frequency Data Multiplexing
- 4). Fast Data Multiplexing

☒ Correct Answer: 2). Frequency Division Multiplexing

Explanation:

Different signals transmitted simultaneously at different frequencies.

Ref: Electronic Communication Systems – George Kennedy

126. TDMA stands for

- 1). Time Division Multiple Access
- 2). Transmission Data Multiple Access
- 3). Time Data Multiple Access
- 4). Transfer Division Multiple Access

☒ Correct Answer: 1). Time Division Multiple Access

Explanation:

Multiple users share channel in different time slots.

Ref: Wireless Communications – Theodore S. Rappaport

127. Radar stands for

- 1). Radio Direction and Ranging
- 2). Radio Detection and Ranging
- 3). Radio Data and Range
- 4). Radio Direction and Radio

✓ Correct Answer: 2). Radio Detection and Ranging

Explanation:

Radar detects objects using radio waves.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

128. Radar measures

- 1). Distance only
- 2). Velocity only
- 3). Direction only
- 4). Distance, velocity and direction

✓ Correct Answer: 4). Distance, velocity and direction

Explanation:

Radar detects position and speed of objects.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

129. Dominant mode in rectangular waveguide is

- 1). TE01
- 2). TE10
- 3). TM10
- 4). TM01

✓ Correct Answer: 2). TE10

Explanation:

TE10 has lowest cutoff frequency.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

130. Magnetron is used as

- 1). Amplifier
- 2). Oscillator
- 3). Detector
- 4). Mixer

✓ Correct Answer: 2). Oscillator

Explanation:

Magnetron generates microwave power.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

131. Klystron works on

- 1). Current modulation
- 2). Voltage modulation
- 3). Velocity modulation
- 4). Frequency modulation

✓ Correct Answer: 3). Velocity modulation

Explanation:

Electron beam velocity is modulated.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

132. TWT stands for

- 1). Traveling Wave Tube
- 2). Transmission Wave Tube
- 3). Transfer Wave Tube
- 4). Time Wave Tube

✓ Correct Answer: 1). Traveling Wave Tube

Explanation:

TWT amplifies microwave signals.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

133. Satellite communication uses

- 1). Ground waves
- 2). Sky waves
- 3). Space waves
- 4). Surface waves

☒ Correct Answer: 3). Space waves

Explanation:

Signals transmitted through space between satellite and earth station.

Ref: Satellite Communications – Dennis Roddy

134. Uplink frequency is

- 1). Earth to satellite
- 2). Satellite to earth
- 3). Satellite to satellite
- 4). Ground to ground

☒ Correct Answer: 1). Earth to satellite

Explanation:

Uplink transmits signals from earth station to satellite.

Ref: Satellite Communications – Timothy Pratt

135. Downlink frequency is

- 1). Earth to satellite
- 2). Satellite to earth
- 3). Satellite to satellite
- 4). Ground to ground

☒ Correct Answer: 2). Satellite to earth

Explanation:

Downlink transmits signals from satellite to earth station.

Ref: Satellite Communications – Timothy Pratt

136. Optical fiber works on

- 1). Reflection
- 2). Refraction
- 3). Total internal reflection
- 4). Diffraction

☒ Correct Answer: 3). Total internal reflection

Explanation:

Light confined within fiber core.

Ref: Optical Fiber Communications – Gerd Keiser

137. Single mode fiber is used for

- 1). Short distance communication
- 2). Long distance communication
- 3). Audio communication
- 4). Radio communication

☒ Correct Answer: 2). Long distance communication

Explanation:

Single mode fiber has low attenuation and dispersion.

Ref: Optical Fiber Communications – Gerd Keiser

138. WDM stands for

- 1). Wave Division Multiplexing
- 2). Wavelength Division Multiplexing
- 3). Wave Data Multiplexing
- 4). Wireless Data Multiplexing

☒ Correct Answer: 2). Wavelength Division Multiplexing

Explanation:

Multiple optical signals transmitted through single fiber.

Ref: Optical Fiber Communications – Gerd Keiser

139. Cellular communication is based on

- 1). Frequency reuse concept
- 2). Time reuse concept
- 3). Signal reuse concept
- 4). Power reuse concept

✓ Correct Answer: 1). Frequency reuse concept

Explanation:

Frequency reuse increases system capacity.

Ref: Wireless Communications – Theodore S. Rappaport

140. GSM stands for

- 1). Global System for Mobile communication
- 2). General System Mobile
- 3). Global Signal Mobile
- 4). General Signal Module

✓ Correct Answer: 1). Global System for Mobile communication

Explanation:

GSM is a digital cellular communication standard.

Ref: Wireless Communications – Theodore S. Rappaport

141. AMPS stands for

- 1). Advanced Mobile Phone System
- 2). Analog Mobile Phone System
- 3). Automatic Mobile Phone System
- 4). Advanced Mobile Packet System

✓ Correct Answer: 1). Advanced Mobile Phone System

Explanation:

AMPS was an early analog cellular system.

Ref: Mobile Cellular Telecommunications – William C.Y. Lee

142. CDMA uses

- 1). Frequency codes
- 2). Time codes
- 3). Unique spreading codes
- 4). Voltage codes

☒ Correct Answer: 3). Unique spreading codes

Explanation:

Users share same channel using different codes.

Ref: Wireless Communications – Theodore S. Rappaport

143. The antenna parameter representing directional ability is

- 1). Efficiency
- 2). Gain
- 3). Directivity
- 4). Polarization

☒ Correct Answer: 3). Directivity

Explanation:

Directivity measures radiation concentration.

Ref: Antennas and Wave Propagation – John D. Kraus

144. Beam width is measured between

- 1). Null points
- 2). Half power points
- 3). Maximum power points
- 4). Minimum power points

☒ Correct Answer: 2). Half power points

Explanation:

Beamwidth is measured between -3 dB points.

Ref: Antennas and Wave Propagation – John D. Kraus

145. Antenna efficiency equals

- 1). Radiated power / input power
- 2). Input power / radiated power
- 3). Radiated power / voltage
- 4). Voltage / power

✓ Correct Answer: 1). Radiated power / input power

Explanation:

Efficiency measures radiation effectiveness.

Ref: Antennas and Wave Propagation – John D. Kraus

146. Yagi antenna is mainly used for

- 1). TV reception
- 2). Radar
- 3). Satellite communication
- 4). Mobile communication

✓ Correct Answer: 1). TV reception

Explanation:

Yagi antennas provide directional reception.

Ref: Antennas and Wave Propagation – K.D. Prasad

147. Log periodic antenna is known for

- 1). Narrow bandwidth
- 2). Wide bandwidth
- 3). Low gain
- 4). Low efficiency

✓ Correct Answer: 2). Wide bandwidth

Explanation:

Log periodic antennas operate over wide frequency range.

Ref: Antennas and Wave Propagation – K.D. Prasad

148. Parabolic reflector antenna provides

- 1). Low gain
- 2). Medium gain
- 3). High gain
- 4). No gain

☒ Correct Answer: 3). High gain

Explanation:

Parabolic reflector focuses energy into narrow beam.

Ref: Antennas and Wave Propagation – John D. Kraus

149. Radar duplexer is used to

- 1). Increase frequency
- 2). Switch between transmitter and receiver
- 3). Amplify signal
- 4). Filter signal

☒ Correct Answer: 2). Switch between transmitter and receiver

Explanation:

Duplexer isolates transmitter and receiver.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

150. Radar indicator used to display target range is

- 1). A-scope
- 2). B-scope
- 3). C-scope
- 4). PPI

☒ Correct Answer: 1). A-scope

Explanation:

A-scope shows target distance as spikes on screen.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

151. Radar indicator that shows a plan position display is

- 1). A-scope
- 2). B-scope
- 3). C-scope
- 4). PPI

✓ Correct Answer: 4). PPI

Explanation:

Plan Position Indicator (PPI) shows target position in polar coordinates.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

152. In fiber optic communication the source used is

- 1). LED
- 2). Laser diode
- 3). Both LED and Laser diode
- 4). Photodiode

✓ Correct Answer: 3). Both LED and Laser diode

Explanation:

LEDs and laser diodes act as optical transmitters.

Ref: Optical Fiber Communications – Gerd Keiser

153. Optical detector used in fiber communication is

- 1). Photodiode
- 2). LED
- 3). LDR
- 4). Thermistor

✓ Correct Answer: 1). Photodiode

Explanation:

Photodiodes convert optical signals into electrical signals.

Ref: Optical Fiber Communications – Gerd Keiser

154. Optical repeaters are used to

- 1). Increase frequency
- 2). Amplify optical signal
- 3). Detect signal
- 4). Filter signal

☒ Correct Answer: 2). Amplify optical signal

Explanation:

Repeaters restore attenuated optical signals.

Ref: Optical Fiber Communications – John M. Senior

155. In cellular communication handoff refers to

- 1). Frequency conversion
- 2). Transfer of call between cells
- 3). Signal amplification
- 4). Power control

☒ Correct Answer: 2). Transfer of call between cells

Explanation:

Handoff ensures continuous communication when a user moves between cells.

Ref: Wireless Communications – Theodore S. Rappaport

156. Binary number system has base

- 1). 2
- 2). 8
- 3). 10
- 4). 16

☒ Correct Answer: 1). 2

Explanation:

Binary system uses digits 0 and 1.

Ref: Digital Fundamentals – Thomas L. Floyd

157. Decimal equivalent of binary $(1010)_2$ is

- 1). 8
- 2). 9
- 3). 10
- 4). 12

☒ Correct Answer: 3). 10

Explanation:

$$1010_2 = 8 + 2 = 10.$$

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

158. NAND gate output is LOW when

- 1). Any input is 1
- 2). All inputs are 1
- 3). All inputs are 0
- 4). Inputs are different

☒ Correct Answer: 2). All inputs are 1

Explanation:

NAND gate output is 0 only when all inputs are 1.

Ref: Modern Digital Electronics – R.P. Jain

159. Flip-flop is a

- 1). Combinational circuit
- 2). Sequential circuit
- 3). Linear circuit
- 4). Passive circuit

☒ Correct Answer: 2). Sequential circuit

Explanation:

Flip-flops store one bit of data.

Ref: Digital Design – M. Morris Mano

160. A register is used for

- 1). Data storage
- 2). Signal amplification
- 3). Frequency conversion
- 4). Power supply

☒ Correct Answer: 1). Data storage

Explanation:

Registers store binary information.

Ref: Modern Digital Electronics – R.P. Jain

161. A counter is used for

- 1). Signal amplification
- 2). Counting pulses
- 3). Voltage regulation
- 4). Frequency generation

☒ Correct Answer: 2). Counting pulses

Explanation:

Counters count clock pulses.

Ref: Digital Design – M. Morris Mano

162. RAM stands for

- 1). Random Access Memory
- 2). Read Access Memory
- 3). Rapid Access Memory
- 4). Random Analog Memory

☒ Correct Answer: 1). Random Access Memory

Explanation:

RAM allows read and write operations.

Ref: Digital Electronics – Anil K. Maini

163. ROM stands for

- 1). Read Only Memory
- 2). Random Only Memory
- 3). Read Output Memory
- 4). Random Output Memory

☒ Correct Answer: 1). Read Only Memory

Explanation:

ROM stores permanent data.

Ref: Digital Electronics – Anil K. Maini

164. R-2R ladder is used in

- 1). A/D converter
- 2). D/A converter
- 3). Oscillator
- 4). Amplifier

☒ Correct Answer: 2). D/A converter

Explanation:

R-2R ladder network converts digital signals to analog.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

165. Successive approximation ADC uses

- 1). Binary search algorithm
- 2). Ramp conversion
- 3). Parallel comparison
- 4). Random conversion

☒ Correct Answer: 1). Binary search algorithm

Explanation:

Each bit determined sequentially.

Ref: Electronic Instrumentation – H.S. Kalsi

166. 8051 is a

- 1). Microprocessor
- 2). Microcontroller
- 3). Digital signal processor
- 4). Analog processor

☒ Correct Answer: 2). Microcontroller

Explanation:

8051 contains CPU, memory and I/O ports.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

167. Number of I/O ports in 8051 is

- 1). 2
- 2). 3
- 3). 4
- 4). 5

☒ Correct Answer: 3). 4

Explanation:

Ports P0–P3 provide 32 I/O pins.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

168. Accumulator register in 8051 is

- 1). A
- 2). B
- 3). C
- 4). D

☒ Correct Answer: 1). A

Explanation:

Most arithmetic operations occur in accumulator.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

169. Machine cycle of 8051 consists of

- 1). 6 clock cycles
- 2). 12 clock cycles
- 3). 24 clock cycles
- 4). 48 clock cycles

☒ Correct Answer: 2). 12 clock cycles

Explanation:

One machine cycle equals 12 oscillator periods.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

170. DNS converts

- 1). IP address to MAC address
- 2). Domain name to IP address
- 3). Port number to protocol
- 4). Packet to frame

☒ Correct Answer: 2). Domain name to IP address

Explanation:

DNS resolves domain names into IP addresses.

Ref: Computer Networks – Andrew S. Tanenbaum

171. FTP protocol is used for

- 1). Email transfer
- 2). File transfer
- 3). Web browsing
- 4). Video streaming

☒ Correct Answer: 2). File transfer

Explanation:

FTP transfers files between systems.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

172. SMTP protocol is used for

- 1). Sending email
- 2). Receiving email
- 3). File transfer
- 4). Web browsing

☒ Correct Answer: 1). Sending email

Explanation:

SMTP handles outgoing mail.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

173. POP3 protocol is used for

- 1). Sending email
- 2). Receiving email
- 3). Web browsing
- 4). File transfer

☒ Correct Answer: 2). Receiving email

Explanation:

POP3 retrieves email from server.

Ref: Computer Networking – Kurose and Ross

174. HTTP protocol transfers

- 1). Email messages
- 2). Web pages
- 3). Files
- 4). DNS queries

☒ Correct Answer: 2). Web pages

Explanation:

HTTP transfers hypertext documents.

Ref: Computer Networks – Andrew S. Tanenbaum

175. IPv4 address length is

- 1). 16 bits
- 2). 32 bits
- 3). 64 bits
- 4). 128 bits

✓ Correct Answer: 2). 32 bits

Explanation:

IPv4 uses 32-bit addressing scheme.

Ref: Data Communications and Networking – Behrouz A. Forouzan

176. IPv6 address length is

- 1). 32 bits
- 2). 64 bits
- 3). 128 bits
- 4). 256 bits

✓ Correct Answer: 3). 128 bits

Explanation:

IPv6 provides larger address space.

Ref: Computer Networks – Andrew S. Tanenbaum

177. Router operates at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 3). Network layer

Explanation:

Routers forward packets based on IP address.

Ref: Computer Networks – Andrew S. Tanenbaum

178. Switch operates at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 2). Data link layer

Explanation:

Switch uses MAC address for frame forwarding.

Ref: Data Communications and Networking – Forouzan

179. Hub operates at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 1). Physical layer

Explanation:

Hub simply repeats signals.

Ref: Computer Networks – Andrew S. Tanenbaum

180. Internet is example of

- 1). LAN
- 2). WAN
- 3). PAN
- 4). MAN

✓ Correct Answer: 2). WAN

Explanation:

Internet connects networks globally.

Ref: Computer Networks – Andrew S. Tanenbaum

181. Bus topology uses

- 1). Central hub
- 2). Backbone cable
- 3). Circular connection
- 4). Mesh connection

✓ Correct Answer: 2). Backbone cable

Explanation:

All devices share one communication line.

Ref: Data Communications and Networking – Forouzan

182. Star topology uses

- 1). Backbone cable
- 2). Central hub
- 3). Ring connection
- 4). Mesh network

✓ Correct Answer: 2). Central hub

Explanation:

Devices connect to central hub or switch.

Ref: Data Communications and Networking – Forouzan

183. Ring topology connects nodes

- 1). Randomly
- 2). In circular loop
- 3). Through hub
- 4). Through backbone cable

✓ Correct Answer: 2). In circular loop

Explanation:

Nodes connected in closed loop.

Ref: Computer Networks – Andrew S. Tanenbaum

184. Packet switching transmits data as

- 1). Frames
- 2). Packets
- 3). Signals
- 4). Waves

✓ Correct Answer: 2). Packets

Explanation:

Data divided into small packets.

Ref: Data Communications and Networking – Forouzan

185. Frame relay is

- 1). Circuit switching
- 2). Packet switching
- 3). Optical switching
- 4). Satellite switching

✓ Correct Answer: 2). Packet switching

Explanation:

Frame relay uses packet switching technique.

Ref: Data and Computer Communications – William Stallings

186. ATM cell size equals

- 1). 48 bytes
- 2). 53 bytes
- 3). 64 bytes
- 4). 128 bytes

✓ Correct Answer: 2). 53 bytes

Explanation:

ATM cell = 48 bytes payload + 5 bytes header.

Ref: Data and Computer Communications – William Stallings

187. Bluetooth network is called

- 1). Subnet
- 2). Piconet
- 3). Cluster
- 4). Mesh

✓ Correct Answer: 2). Piconet

Explanation:

Bluetooth devices form a small network called piconet.

Ref: Data Communications and Networking – Forouzan

188. WLAN operates under

- 1). IEEE 802.3
- 2). IEEE 802.5
- 3). IEEE 802.11
- 4). IEEE 802.15

✓ Correct Answer: 3). IEEE 802.11

Explanation:

802.11 standard defines wireless LAN.

Ref: Computer Networking – Kurose and Ross

189. Shannon theorem determines

- 1). Channel capacity
- 2). Signal voltage
- 3). Signal frequency
- 4). Signal amplitude

✓ Correct Answer: 1). Channel capacity

Explanation:

Defines maximum data transmission rate.

Ref: Data Communications and Networking – Forouzan

190. Main advantage of networking is

- 1). Data storage
- 2). Resource sharing
- 3). Signal amplification
- 4). Signal generation

✓ Correct Answer: 2). Resource sharing

Explanation:

Networking allows sharing of files and devices.

Ref: Data Communications and Networking – Forouzan

191. The number of layers in the TCP/IP model is

- 1). 3
- 2). 4
- 3). 5
- 4). 7

✓ Correct Answer: 2). 4

Explanation:

TCP/IP model consists of Network Interface, Internet, Transport and Application layers.

Ref: Data Communications and Networking – Behrouz A. Forouzan

192. The protocol used for secure web communication is

- 1). HTTP
- 2). HTTPS
- 3). FTP
- 4). SMTP

✓ Correct Answer: 2). HTTPS

Explanation:

HTTPS is HTTP with encryption using SSL/TLS.

Ref: Computer Networks – Andrew S. Tanenbaum

193. A proxy server acts as

- 1). End user computer
- 2). Intermediary between client and server
- 3). Data storage device
- 4). Network switch

☒ Correct Answer: 2). Intermediary between client and server

Explanation:

Proxy servers improve security and caching.

Ref: Data Communications and Networking – Behrouz A. Forouzan

194. A web server is used to

- 1). Store email
- 2). Host websites
- 3). Transfer files only
- 4). Generate signals

☒ Correct Answer: 2). Host websites

Explanation:

Web servers store and deliver web pages to clients.

Ref: Computer Networking: A Top-Down Approach – James Kurose and Keith Ross

195. In AM transmission, the carrier frequency is

- 1). Equal to modulating frequency
- 2). Much higher than modulating frequency
- 3). Lower than modulating frequency
- 4). Zero

☒ Correct Answer: 2). Much higher than modulating frequency

Explanation:

Carrier frequency must be significantly higher than modulating signal.

Ref: Electronic Communication Systems – George Kennedy

196. The modulation index for 100% modulation is

- 1). 0
- 2). 0.5
- 3). 1
- 4). 2

✓ Correct Answer: 3). 1

Explanation:

At $m = 1$, modulation is exactly 100%.

Ref: Electronic Communication Systems – George Kennedy

197. The main advantage of FM over AM is

- 1). Lower bandwidth
- 2). Better noise immunity
- 3). Lower power consumption
- 4). Simpler receiver

✓ Correct Answer: 2). Better noise immunity

Explanation:

FM signals are less affected by noise.

Ref: Communication Systems – Simon Haykin

198. The antenna gain is measured in

- 1). Volts
- 2). Watts
- 3). dB
- 4). Ohms

✓ Correct Answer: 3). dB

Explanation:

Antenna gain is expressed in decibels.

Ref: Antennas and Wave Propagation – John D. Kraus

199. Satellite communication mainly uses

- 1). LF band
- 2). MF band
- 3). Microwave band
- 4). Audio band

☒ Correct Answer: 3). Microwave band

Explanation:

Microwaves penetrate atmosphere effectively for satellite links.

Ref: Satellite Communications – Dennis Roddy

200. The main purpose of multiplexing is

- 1). Increase signal power
- 2). Combine multiple signals into one channel
- 3). Reduce signal noise
- 4). Amplify signals

☒ Correct Answer: 2). Combine multiple signals into one channel

Explanation:

Multiplexing allows efficient use of communication channel.

Ref: Electronic Communication Systems – George Kennedy

APE CET – 2026
Electronics and Communication Engineering
Grand Test - 1

101. The cut-in voltage of a silicon diode is approximately

- 1). 0.2 V
- 2). 0.3 V
- 3). 0.7 V
- 4). 1.2 V

☒ Correct Answer: 3). 0.7 V

Explanation:

Silicon diode begins conduction around 0.7 V in forward bias.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

102. A Zener diode is mainly used for

- 1). Rectification
- 2). Amplification
- 3). Voltage regulation
- 4). Oscillation

☒ Correct Answer: 3). Voltage regulation

Explanation:

Zener diode operates in breakdown region to maintain constant voltage.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

103. In CE configuration transistor provides

- 1). Low gain
- 2). Moderate gain
- 3). High voltage and current gain
- 4). Unity gain

☒ Correct Answer: 3). High voltage and current gain

Explanation:

CE amplifier offers high current and voltage gain.

Ref: Electronic Principles – Albert Malvino and David J. Bates

104. The input impedance of CC configuration is

- 1). Very low
- 2). Low
- 3). High
- 4). Infinite

☒ Correct Answer: 3). High

Explanation:

Emitter follower (CC) has high input impedance.

Ref: Electronic Devices and Circuit Theory – Boylestad and Nashelsky

105. The advantage of bridge rectifier over full-wave rectifier is

- 1). Higher ripple
- 2). No center tapped transformer required
- 3). Lower efficiency
- 4). Lower output

☒ Correct Answer: 2). No center tapped transformer required

Explanation:

Bridge rectifier uses four diodes and does not need center tap transformer.

Ref: Electronic Devices and Circuits – David A. Bell

106. The ripple factor of full wave rectifier is approximately

- 1). 0.482
- 2). 1.21
- 3). 0.25
- 4). 0.707

☒ Correct Answer: 1). 0.482

Explanation:

Full wave rectifier ripple factor is 0.482.

Ref: Electronic Devices and Circuit Theory – Boylestad and Nashelsky

107. In FET the controlling parameter is

- 1). Base current
- 2). Collector current

- 3). Gate voltage
- 4). Emitter current

✓ Correct Answer: 3). Gate voltage

Explanation:

FET is voltage controlled device.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

108. UJT is mainly used for

- 1). Amplifiers
- 2). Oscillators
- 3). Rectifiers
- 4). Filters

✓ Correct Answer: 2). Oscillators

Explanation:

UJT commonly used in relaxation oscillators.

Ref: Electronic Devices and Circuits – David A. Bell

109. In RC coupled amplifier the coupling element is

- 1). Inductor
- 2). Transformer
- 3). Capacitor
- 4). Diode

✓ Correct Answer: 3). Capacitor

Explanation:

RC coupling uses capacitor to transfer signal between stages.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

110. An operational amplifier ideally has

- 1). Low gain
- 2). Infinite gain
- 3). Zero gain
- 4). Negative gain

✓ Correct Answer: 2). Infinite gain

Explanation:

Ideal op-amp has infinite open loop gain.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

111. The bandwidth of AM signal is

- 1). f_m
- 2). $2f_m$
- 3). f_c
- 4). $2f_c$

✓ Correct Answer: 2). $2f_m$

Explanation:

AM bandwidth equals twice the modulating frequency.

Ref: Electronic Communication Systems – George Kennedy

112. In superheterodyne receiver the IF frequency for AM is

- 1). 455 kHz
- 2). 10.7 MHz
- 3). 100 kHz
- 4). 1 MHz

✓ Correct Answer: 1). 455 kHz

Explanation:

Standard IF for AM receivers is 455 kHz.

Ref: Electronic Communication Systems – George Kennedy

113. In PCM the first step is

- 1). Quantization
- 2). Sampling
- 3). Encoding
- 4). Detection

✓ Correct Answer: 2). Sampling

Explanation:

Analog signal is first sampled.

Ref: Digital Communications – Sanjay Sharma

114. In ASK modulation the parameter varied is

- 1). Frequency
- 2). Amplitude
- 3). Phase
- 4). Bandwidth

✓ Correct Answer: 2). Amplitude

Explanation:

ASK changes amplitude according to digital data.

Ref: Digital Communications – Sanjay Sharma

115. Yagi antenna is mainly used for

- 1). Radar
- 2). Television reception
- 3). Satellite communication
- 4). Microwave heating

✓ Correct Answer: 2). Television reception

Explanation:

Yagi antenna provides high gain directional reception.

Ref: Antennas and Wave Propagation – John D. Kraus

116. Waveguides are used for

- 1). Low frequency signals
- 2). Audio signals
- 3). Microwave signals
- 4). DC signals

✓ Correct Answer: 3). Microwave signals

Explanation:

Waveguides guide microwave energy efficiently.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

117. Radar range is calculated using

- 1). Doppler equation
- 2). Radar range equation

- 3). Shannon theorem
- 4). Nyquist theorem

✓ Correct Answer: 2). Radar range equation

Explanation:

Radar equation determines maximum detection range.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

118. Optical fiber communication uses

- 1). Electrical signals
- 2). Light signals
- 3). Microwave signals
- 4). Magnetic signals

✓ Correct Answer: 2). Light signals

Explanation:

Information transmitted as light pulses.

Ref: Optical Fiber Communications – Gerd Keiser

119. GSM system mainly uses

- 1). FDMA
- 2). TDMA
- 3). CDMA
- 4). OFDM

✓ Correct Answer: 2). TDMA

Explanation:

GSM uses time division multiple access.

Ref: Wireless Communications – Theodore S. Rappaport

120. Binary number system has base

- 1). 2
- 2). 8
- 3). 10
- 4). 16

✓ Correct Answer: 1). 2

Explanation:

Binary system uses digits 0 and 1.

Ref: Digital Design – M. Morris Mano

121. The decimal equivalent of binary number $(10101)_2$ is

- 1). 19
- 2). 20
- 3). 21
- 4). 22

☒ Correct Answer: 3). 21

Explanation:

$$(10101)_2 = 1 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 = 16 + 4 + 1 = 21.$$

Ref: Digital Fundamentals – Thomas L. Floyd

122. NAND gate output is 0 when

- 1). Any input is 1
- 2). All inputs are 0
- 3). All inputs are 1
- 4). Inputs are unequal

☒ Correct Answer: 3). All inputs are 1

Explanation:

NAND = NOT(AND). AND output becomes 1 only when all inputs are 1.

Ref: Modern Digital Electronics – R.P. Jain

123. The carry output of half adder is

- 1). $A + B$
- 2). AB
- 3). $A \oplus B$
- 4). $A'B$

☒ Correct Answer: 2). AB

Explanation:

Carry occurs only when both inputs are high.

Ref: Digital Design – M. Morris Mano

124. A MOD-16 counter requires

- 1). 2 flip-flops
- 2). 3 flip-flops
- 3). 4 flip-flops
- 4). 5 flip-flops

✓ Correct Answer: 3). 4 flip-flops

Explanation:

$$2^4 = 16 \text{ states.}$$

Ref: Modern Digital Electronics – R.P. Jain

125. Resolution of 4-bit DAC is

- 1). 1/7
- 2). 1/15
- 3). 1/31
- 4). 1/63

✓ Correct Answer: 2). 1/15

Explanation:

$$\text{Resolution} = 1/(2^4 - 1) = 1/15.$$

Ref: Integrated Electronics – Jacob Millman

126. A 3-variable K-map contains

- 1). 4 cells
- 2). 8 cells
- 3). 16 cells
- 4). 32 cells

✓ Correct Answer: 2). 8 cells

Explanation:

Number of cells = 2^n where n = number of variables.

Ref: Fundamentals of Digital Circuits – A. Anand Kumar

127. In a ripple counter the clock signal

- 1). Is applied to all flip-flops simultaneously
- 2). Is applied only to first flip-flop
- 3). Is applied to last flip-flop
- 4). Is applied randomly

✓ Correct Answer: 2). Is applied only to first flip-flop

Explanation:

Clock propagates sequentially.

Ref: Digital Design – M. Morris Mano

128. SRAM stores data using

- 1). Capacitors
- 2). Flip-flops
- 3). Inductors
- 4). Resistors

✓ Correct Answer: 2). Flip-flops

Explanation:

SRAM uses bistable circuits.

Ref: Digital Electronics – Anil K. Maini

129. DRAM requires

- 1). Amplification
- 2). Refreshing
- 3). Oscillation
- 4). Filtering

✓ Correct Answer: 2). Refreshing

Explanation:

Capacitors lose charge and require periodic refresh.

Ref: Digital Electronics – Anil K. Maini

130. The instruction used to call subroutine in 8051 is

- 1). RET
- 2). CALL
- 3). JMP
- 4). MOV

✓ Correct Answer: 2). CALL

Explanation:

CALL transfers control to subroutine.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

131. The instruction used to return from subroutine is

- 1). RET
- 2). JMP
- 3). CALL
- 4). MOV

✓ Correct Answer: 1). RET

Explanation:

RET returns execution to main program.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

132. Default stack pointer value in 8051 is

- 1). 00H
- 2). 07H
- 3). 10H
- 4). FFH

✓ Correct Answer: 2). 07H

Explanation:

SP initially points to location 07H.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

133. The number of I/O ports in 8051 is

- 1). 2
- 2). 3
- 3). 4
- 4). 5

✓ Correct Answer: 3). 4

Explanation:

Ports P0–P3 provide 32 I/O pins.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

134. Machine cycle of 8051 consists of

- 1). 6 clock cycles
- 2). 12 clock cycles
- 3). 24 clock cycles
- 4). 48 clock cycles

☒ Correct Answer: 2). 12 clock cycles

Explanation:

Each machine cycle requires 12 oscillator periods.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

135. The instruction DJNZ stands for

- 1). Decrement and Jump if Not Zero
- 2). Divide and Jump if Not Zero
- 3). Decrement and Jump if Zero
- 4). Divide and Jump if Zero

☒ Correct Answer: 1). Decrement and Jump if Not Zero

Explanation:

Used for loop operations.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

136. The protocol used for file transfer is

- 1). HTTP
- 2). FTP
- 3). SMTP
- 4). POP

☒ Correct Answer: 2). FTP

Explanation:

FTP transfers files between computers.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

137. DNS is used to

- 1). Transfer files
- 2). Convert domain name to IP address
- 3). Send emails
- 4). Detect errors

✓ Correct Answer: 2). Convert domain name to IP address

Explanation:

DNS resolves domain names.

Ref: Computer Networks – Andrew S. Tanenbaum

138. HTTP uses port number

- 1). 21
- 2). 25
- 3). 80
- 4). 110

✓ Correct Answer: 3). 80

Explanation:

HTTP default port is 80.

Ref: Computer Networking – Kurose and Ross

139. SMTP is used for

- 1). Sending emails
- 2). Receiving emails
- 3). File transfer
- 4). Web browsing

✓ Correct Answer: 1). Sending emails

Explanation:

SMTP transfers outgoing mail.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

140. POP protocol is used for

- 1). Sending emails
- 2). Receiving emails
- 3). File transfer
- 4). Web browsing

✓ Correct Answer: 2). Receiving emails

Explanation:

POP retrieves mail from server.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

141. IPv4 address length is

- 1). 16 bits
- 2). 32 bits
- 3). 64 bits
- 4). 128 bits

✓ Correct Answer: 2). 32 bits

Explanation:

IPv4 uses 32-bit addressing.

Ref: Computer Networks – Andrew S. Tanenbaum

142. IPv6 address length is

- 1). 32 bits
- 2). 64 bits
- 3). 128 bits
- 4). 256 bits

✓ Correct Answer: 3). 128 bits

Explanation:

IPv6 expands address space.

Ref: Computer Networks – Andrew S. Tanenbaum

143. Router operates at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 3). Network layer

Explanation:

Router performs packet routing.

Ref: Data Communications and Networking – Behrouz A. Forouzan

144. Switch operates at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✅ Correct Answer: 2). Data link layer

Explanation:

Switch forwards frames based on MAC addresses.

Ref: Computer Networks – Andrew S. Tanenbaum

145. LAN stands for

- 1). Local Area Network
- 2). Large Area Network
- 3). Logical Area Network
- 4). Link Area Network

✅ Correct Answer: 1). Local Area Network

Explanation:

LAN connects devices in small geographic area.

Ref: Data Communications and Networking – Behrouz A. Forouzan

146. WAN stands for

- 1). Wide Area Network
- 2). Wireless Area Network
- 3). World Access Network
- 4). Wide Access Node

✅ Correct Answer: 1). Wide Area Network

Explanation:

WAN connects networks across large regions.

Ref: Data Communications and Networking – Behrouz A. Forouzan

147. Bus topology uses

- 1). Central hub
- 2). Single backbone cable
- 3). Ring cable
- 4). Mesh connection

✓ Correct Answer: 2). Single backbone cable

Explanation:

All nodes share a common cable.

Ref: Computer Networks – Andrew S. Tanenbaum

148. Star topology uses

- 1). Backbone cable
- 2). Central hub
- 3). Ring connection
- 4). Mesh network

✓ Correct Answer: 2). Central hub

Explanation:

All devices connect through hub.

Ref: Data Communications and Networking – Behrouz A. Forouzan

149. Ring topology connects nodes

- 1). In star pattern
- 2). In closed loop
- 3). In mesh network
- 4). Randomly

✓ Correct Answer: 2). In closed loop

Explanation:

Each node connected to two neighbors.

Ref: Computer Networks – Andrew S. Tanenbaum

150. The main goal of networking is

- 1). Data storage
- 2). Resource sharing
- 3). Signal generation
- 4). Signal amplification

✓ Correct Answer: 2). Resource sharing

Explanation:

Networks allow sharing of resources and communication.

Ref: Data Communications and Networking – Behrouz A. Forouzan

161. In mesh analysis the unknown variable is

- 1). Voltage
- 2). Current
- 3). Power
- 4). Resistance

✓ Correct Answer: 2). Current

Explanation:

Mesh current analysis determines loop currents using KVL.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

162. In nodal analysis the unknown variable is

- 1). Voltage
- 2). Current
- 3). Power
- 4). Resistance

✓ Correct Answer: 1). Voltage

Explanation:

Node voltage method determines voltages at circuit nodes.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

163. Thevenin's theorem replaces a network with

- 1). Current source and resistance
- 2). Voltage source and series resistance
- 3). Two current sources
- 4). Two voltage sources

✓ Correct Answer: 2). Voltage source and series resistance

Explanation:

Thevenin equivalent consists of V_{th} and R_{th} .

Ref: Network Analysis – M.E. Van Valkenburg

164. Norton's theorem replaces network with

- 1). Voltage source and series resistance
- 2). Current source and parallel resistance
- 3). Two current sources
- 4). Voltage divider

✓ Correct Answer: 2). Current source and parallel resistance

Explanation:

Equivalent circuit has I_n in parallel with R_n .

Ref: Network Analysis – M.E. Van Valkenburg

165. Maximum power transfer occurs when

- 1). $R_L = 0$
- 2). $R_L = R_{th}$
- 3). $R_L = 2R_{th}$
- 4). $R_L = R_{th}/2$

✓ Correct Answer: 2). $R_L = R_{th}$

Explanation:

Maximum power delivered when load resistance equals Thevenin resistance.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

166. The quality factor (Q) of resonant circuit indicates

- 1). Power loss
- 2). Selectivity
- 3). Resistance
- 4). Inductance

✓ Correct Answer: 2). Selectivity

Explanation:

Higher Q indicates sharper resonance.

Ref: Circuits and Networks – A. Sudhakar and Shyammmohan Palli

167. Bandwidth of resonant circuit is

- 1). $f_r \times Q$
- 2). f_r / Q
- 3). Q / f_r
- 4). f_r^2

✓ Correct Answer: 2). f_r / Q

Explanation:

Bandwidth inversely proportional to Q factor.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

168. In RC circuit transient response depends on

- 1). Time constant
- 2). Frequency
- 3). Power
- 4). Voltage

✓ Correct Answer: 1). Time constant

Explanation:

Time constant $\tau = RC$ determines charging and discharging rate.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

169. Time constant of RC circuit is

- 1). R/C
- 2). RC
- 3). $1/RC$
- 4). $\sqrt{RC}$

✓ Correct Answer: 2). RC

Explanation:

Time constant equals product of resistance and capacitance.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

170. In RL circuit time constant is

- 1). L/R
- 2). R/L
- 3). LR
- 4). $\sqrt{LR}$

✓ Correct Answer: 1). L/R

Explanation:

RL time constant equals inductance divided by resistance.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

171. Linear wave shaping circuit using RC can act as

- 1). Amplifier
- 2). Integrator
- 3). Rectifier
- 4). Oscillator

✓ Correct Answer: 2). Integrator

Explanation:

RC circuits perform integration of input signals.

Ref: Pulse and Digital Circuits – A. Anand Kumar

172. Characteristic impedance of transmission line depends on

- 1). Resistance only
- 2). Inductance and capacitance
- 3). Voltage
- 4). Current

✓ Correct Answer: 2). Inductance and capacitance

Explanation:

Characteristic impedance $Z_0 = \sqrt{L/C}$.

Ref: Networks, Lines and Fields – John D. Ryder

173. Standing Wave Ratio (SWR) indicates

- 1). Signal power
- 2). Impedance mismatch
- 3). Signal frequency
- 4). Signal voltage

✓ Correct Answer: 2). Impedance mismatch

Explanation:

SWR measures reflection on transmission line.

Ref: Networks, Lines and Fields – John D. Ryder

174. CRO is mainly used to

- 1). Measure resistance
- 2). Display waveforms
- 3). Measure inductance
- 4). Amplify signals

☒ Correct Answer: 2). Display waveforms

Explanation:

Cathode ray oscilloscope visually displays signals.

Ref: Electronic Instrumentation – H.S. Kalsi

175. Time base generator in CRO produces

- 1). Horizontal sweep voltage
- 2). Vertical voltage
- 3). AC signal
- 4). DC signal

☒ Correct Answer: 1). Horizontal sweep voltage

Explanation:

Time base moves electron beam horizontally.

Ref: Electronic Devices and Circuits – David A. Bell

176. Dual slope ADC works on

- 1). Single integration
- 2). Dual integration principle
- 3). Binary search
- 4). Parallel comparison

☒ Correct Answer: 2). Dual integration principle

Explanation:

Integrates input voltage then reference voltage.

Ref: Electronic Instrumentation – H.S. Kalsi

177. Successive approximation ADC uses

- 1). Binary search method
- 2). Counting method
- 3). Parallel method
- 4). Random method

✓ Correct Answer: 1). Binary search method

Explanation:

Determines each bit sequentially.

Ref: Electronic Instrumentation – H.S. Kalsi

178. SCR belongs to

- 1). Thyristor family
- 2). Transistor family
- 3). Diode family
- 4). FET family

✓ Correct Answer: 1). Thyristor family

Explanation:

SCR is a four-layer PNP device.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

179. TRIAC is used for

- 1). DC control
- 2). AC power control
- 3). Signal amplification
- 4). Oscillation

✓ Correct Answer: 2). AC power control

Explanation:

TRIAC conducts in both directions.

Ref: Power Electronics – P.S. Bimbhra

180. IGBT combines features of

- 1). BJT and MOSFET
- 2). Diode and transistor
- 3). FET and diode
- 4). BJT and SCR

✓ Correct Answer: 1). BJT and MOSFET

Explanation:

IGBT combines high input impedance with high current capability.

Ref: Power Electronics – Muhammad H. Rashid

181. LDR is used for

- 1). Temperature sensing
- 2). Light sensing
- 3). Pressure sensing
- 4). Voltage sensing

✓ Correct Answer: 2). Light sensing

Explanation:

LDR resistance varies with light intensity.

Ref: Electronic Devices and Circuit Theory – Boylestad

182. LVDT is used to measure

- 1). Temperature
- 2). Displacement
- 3). Pressure
- 4). Voltage

✓ Correct Answer: 2). Displacement

Explanation:

Linear Variable Differential Transformer measures linear displacement.

Ref: A Course in Electrical and Electronic Measurements – A.K. Sawhney

183. Thermocouple works on

- 1). Seebeck effect
- 2). Hall effect
- 3). Photoelectric effect
- 4). Faraday effect

✓ Correct Answer: 1). Seebeck effect

Explanation:

Voltage produced due to temperature difference.

Ref: A Course in Electrical and Electronic Measurements – A.K. Sawhney

184. Ultrasonic waves have frequency

- 1). Below 20 Hz
- 2). Below 20 kHz
- 3). Above 20 kHz
- 4). Above 1 MHz

✓ Correct Answer: 3). Above 20 kHz

Explanation:

Ultrasonic waves exceed audible frequency range.

Ref: Industrial Electronics – G.K. Mithal

185. Pulse echo flaw detector is used for

- 1). Material testing
- 2). Voltage measurement
- 3). Temperature measurement
- 4). Current measurement

✓ Correct Answer: 1). Material testing

Explanation:

Ultrasonic pulses detect internal defects.

Ref: Industrial Electronics – G.K. Mithal

186. Induction heating uses

- 1). Eddy currents
- 2). Capacitive current
- 3). Direct current
- 4). Static charge

✓ Correct Answer: 1). Eddy currents

Explanation:

Alternating magnetic field induces eddy currents.

Ref: Industrial Electronics – G.K. Mithal

187. Transfer function represents

- 1). Output/Input ratio
- 2). Input/Output ratio
- 3). Voltage/Current ratio
- 4). Power ratio

✓ Correct Answer: 1). Output/Input ratio

Explanation:

Transfer function relates output to input in Laplace domain.

Ref: Control Systems Engineering – I.J. Nagrath and M. Gopal

188. Closed loop system has

- 1). No feedback
- 2). Feedback
- 3). Amplification only
- 4). Oscillation

✓ Correct Answer: 2). Feedback

Explanation:

Output is fed back to input.

Ref: Control Systems – A. Anand Kumar

189. Open loop system has

- 1). Feedback
- 2). No feedback
- 3). Oscillation
- 4). Amplification

✓ Correct Answer: 2). No feedback

Explanation:

Output does not influence input.

Ref: Control Systems – A. Anand Kumar

190. Shannon theorem determines

- 1). Maximum channel capacity
- 2). Signal voltage
- 3). Signal frequency
- 4). Signal amplitude

✓ Correct Answer: 1). Maximum channel capacity

Explanation:

Shannon theorem defines maximum data rate.

Ref: Data Communications and Networking – Behrouz A. Forouzan

191. Bus topology uses

- 1). Single backbone cable
- 2). Central hub
- 3). Ring cable
- 4). Mesh structure

✓ Correct Answer: 1). Single backbone cable

Explanation:

All devices share one communication cable.

Ref: Computer Networks – Andrew S. Tanenbaum

192. Star topology uses

- 1). Hub
- 2). Bus cable
- 3). Ring cable
- 4). Mesh network

✓ Correct Answer: 1). Hub

Explanation:

All nodes connect through central hub.

Ref: Data Communications and Networking – Forouzan

193. Ring topology connects devices

- 1). In circle
- 2). Through hub
- 3). Through bus cable
- 4). Randomly

✓ Correct Answer: 1). In circle

Explanation:

Nodes form closed loop network.

Ref: Computer Networks – Andrew S. Tanenbaum

194. Packet switching transmits data

- 1). In packets
- 2). In full messages

- 3). In circuits
- 4). In analog signals

✓ Correct Answer: 1). In packets

Explanation:

Message divided into packets.

Ref: Data Communications and Networking – Forouzan

195. OSI model has

- 1). 5 layers
- 2). 6 layers
- 3). 7 layers
- 4). 8 layers

✓ Correct Answer: 3). 7 layers

Explanation:

OSI architecture consists of seven layers.

Ref: Computer Networking – Kurose and Ross

196. Physical layer handles

- 1). Data routing
- 2). Bit transmission
- 3). Error control
- 4). Encryption

✓ Correct Answer: 2). Bit transmission

Explanation:

Physical layer transmits raw bits.

Ref: Computer Networks – Andrew S. Tanenbaum

197. Data link layer performs

- 1). Routing
- 2). Error detection
- 3). Encryption
- 4). Application control

✓ Correct Answer: 2). Error detection

Explanation:

Frame error detection handled at this layer.

Ref: Data Communications and Networking – Forouzan

198. Network layer performs

- 1). Routing
- 2). Encryption
- 3). Compression
- 4). Signal amplification

✓ Correct Answer: 1). Routing

Explanation:

Network layer determines path for packets.

Ref: Computer Networks – Andrew S. Tanenbaum

199. Transport layer provides

- 1). Reliable communication
- 2). Signal generation
- 3). Packet switching
- 4). Physical transmission

✓ Correct Answer: 1). Reliable communication

Explanation:

Transport layer ensures reliable data transfer.

Ref: Computer Networking – Kurose and Ross

200. Application layer provides

- 1). Network routing
- 2). User services
- 3). Error correction
- 4). Signal amplification

✓ Correct Answer: 2). User services

Explanation:

Application layer interfaces with user applications.

Ref: Data Communications and Networking – Behrouz A. Forouzan

APE CET – 2026
Electronics and Communication Engineering
Grand Test - 2

101. A semiconductor diode conducts current when it is

- 1). Reverse biased
- 2). Forward biased
- 3). Unbiased
- 4). Neutral

☒ Correct Answer: 2). Forward biased

Explanation:

Forward bias reduces depletion layer and allows current flow.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

102. The Zener diode operates mainly in

- 1). Forward region
- 2). Breakdown region
- 3). Cutoff region
- 4). Saturation region

☒ Correct Answer: 2). Breakdown region

Explanation:

Zener diode maintains constant voltage in breakdown region.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

103. The transistor configuration having highest current gain is

- 1). CB
- 2). CE
- 3). CC
- 4). Common source

☒ Correct Answer: 2). CE

Explanation:

Common emitter configuration provides high current and voltage gain.

Ref: Electronic Principles – Albert Malvino and David J. Bates

104. A clipper circuit is used to

- 1). Amplify signals
- 2). Remove part of signal waveform
- 3). Generate oscillations
- 4). Rectify AC

☒ Correct Answer: 2). Remove part of signal waveform

Explanation:

Clippers limit signal amplitude.

Ref: Electronic Devices and Circuits – David A. Bell

105. A clamper circuit is used to

- 1). Shift DC level of signal
- 2). Amplify signal
- 3). Generate pulses
- 4). Detect signals

☒ Correct Answer: 1). Shift DC level of signal

Explanation:

Clamper shifts waveform vertically without altering shape.

Ref: Electronic Devices and Circuit Theory – Boylestad

106. A full wave rectifier converts

- 1). AC to AC
- 2). DC to AC
- 3). AC to DC
- 4). DC to DC

☒ Correct Answer: 3). AC to DC

Explanation:

Rectifiers convert alternating current into pulsating DC.

Ref: Electronic Devices and Circuits – David A. Bell

107. The efficiency of full wave rectifier is approximately

- 1). 40.6%
- 2). 50%
- 3). 81.2%
- 4). 90%

☒ Correct Answer: 3). 81.2%

Explanation:

Full wave rectifier theoretical efficiency is 81.2%.

Ref: Electronic Devices and Circuit Theory – Boylestad

108. In FET the input impedance is

- 1). Low
- 2). Medium
- 3). Very high
- 4). Zero

☒ Correct Answer: 3). Very high

Explanation:

Gate draws negligible current.

Ref: Electronic Devices and Circuits – Millman and Halkias

109. The most commonly used transistor amplifier configuration is

- 1). CB
- 2). CE
- 3). CC
- 4). CS

☒ Correct Answer: 2). CE

Explanation:

CE provides good gain and moderate impedance.

Ref: Electronic Principles – Malvino

110. Feedback in amplifier is used for

- 1). Increasing distortion
- 2). Improving stability
- 3). Reducing bandwidth
- 4). Increasing noise

☒ Correct Answer: 2). Improving stability

Explanation:

Negative feedback stabilizes gain and reduces distortion.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

111. In AM modulation index must be

- 1). Greater than 1
- 2). Less than or equal to 1
- 3). Equal to 2
- 4). Negative

☒ Correct Answer: 2). Less than or equal to 1

Explanation:

Overmodulation occurs when $m > 1$.

Ref: Electronic Communication Systems – George Kennedy

112. Bandwidth of AM signal is

- 1). f_m
- 2). $2f_m$
- 3). f_c
- 4). $2f_c$

☒ Correct Answer: 2). $2f_m$

Explanation:

Bandwidth equals twice the highest modulating frequency.

Ref: Electronic Communication Systems – George Kennedy

113. FM modulation varies

- 1). Amplitude
- 2). Frequency
- 3). Phase
- 4). Power

✓ Correct Answer: 2). Frequency

Explanation:

Carrier frequency varies according to modulating signal.

Ref: Communication Systems – Simon Haykin

114. In superheterodyne receiver the IF frequency for FM is

- 1). 455 kHz
- 2). 10.7 MHz
- 3). 1 MHz
- 4). 100 kHz

✓ Correct Answer: 2). 10.7 MHz

Explanation:

Standard IF for FM receivers is 10.7 MHz.

Ref: Electronic Communication Systems – George Kennedy

115. PCM stands for

- 1). Pulse Code Modulation
- 2). Pulse Carrier Modulation
- 3). Phase Code Modulation
- 4). Pulse Current Modulation

✓ Correct Answer: 1). Pulse Code Modulation

Explanation:

PCM converts analog signals to digital format.

Ref: Digital Communications – Sanjay Sharma

116. ASK stands for

- 1). Amplitude Shift Keying
- 2). Analog Signal Keying
- 3). Amplitude Signal Keying
- 4). Automatic Signal Keying

✓ Correct Answer: 1). Amplitude Shift Keying

Explanation:

Digital data modulates amplitude of carrier.

Ref: Digital Communications – Sanjay Sharma

117. In fiber optic communication signal travels as

- 1). Electrical pulses
- 2). Light pulses
- 3). Microwave signals
- 4). Radio signals

✓ Correct Answer: 2). Light pulses

Explanation:

Fiber optics transmit data through light.

Ref: Optical Fiber Communications – Gerd Keiser

118. Radar stands for

- 1). Radio Detection and Ranging
- 2). Radio Direction and Range
- 3). Radio Data and Range
- 4). Radio Detection and Radio

✓ Correct Answer: 1). Radio Detection and Ranging

Explanation:

Radar detects objects using reflected radio waves.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

119. Binary system uses digits

- 1). 0–9
- 2). 0–7
- 3). 0 and 1
- 4). 0–15

✓ Correct Answer: 3). 0 and 1

Explanation:

Binary system has base 2.

Ref: Digital Design – M. Morris Mano

120. NAND gate is called

- 1). Universal gate
- 2). Exclusive gate
- 3). Buffer gate
- 4). Basic gate

✓ Correct Answer: 1). Universal gate

Explanation:

Any logic gate can be implemented using NAND gates.

Ref: Modern Digital Electronics – R.P. Jain

121. The decimal equivalent of binary number (11010)₂ is

- 1). 24
- 2). 25
- 3). 26
- 4). 27

✓ Correct Answer: 3). 26

Explanation:

$$(11010)_2 = 1 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 0 \times 2^0 = 16 + 8 + 2 = 26.$$

Ref: Digital Fundamentals – Thomas L. Floyd

122. The Boolean expression $A + A'B$ simplifies to

- 1). A
- 2). $A + B$
- 3). $A + B'$
- 4). B

☒ Correct Answer: 2). $A + B$

Explanation:

Using Boolean algebra: $A + A'B = (A + A')(A + B) = 1(A + B) = A + B$.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

123. The output of XOR gate is HIGH when

- 1). Both inputs are same
- 2). Both inputs are 0
- 3). Inputs are different
- 4). Inputs are 1

☒ Correct Answer: 3). Inputs are different

Explanation:

XOR gate produces output 1 only when inputs differ.

Ref: Modern Digital Electronics – R.P. Jain

124. A full adder adds

- 1). Two bits
- 2). Two bits and carry
- 3). Three bits only
- 4). Four bits

☒ Correct Answer: 2). Two bits and carry

Explanation:

Full adder adds A, B and carry-in.

Ref: Digital Design – M. Morris Mano

125. Number of flip-flops required for MOD-32 counter is

- 1). 4
- 2). 5
- 3). 6
- 4). 7

☒ Correct Answer: 2). 5

Explanation:

$$2^5 = 32 \text{ states.}$$

Ref: Modern Digital Electronics – R.P. Jain

126. Resolution of 8-bit DAC is approximately

- 1). 1/15
- 2). 1/127
- 3). 1/255
- 4). 1/511

☒ Correct Answer: 3). 1/255

Explanation:

$$\text{Resolution} = 1/(2^8 - 1) = 1/255.$$

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

127. A 4-variable K-map contains

- 1). 8 cells
- 2). 16 cells
- 3). 32 cells
- 4). 64 cells

☒ Correct Answer: 2). 16 cells

Explanation:

$$\text{Cells} = 2^4 = 16.$$

Ref: Fundamentals of Digital Circuits – A. Anand Kumar

128. In synchronous counter

- 1). Clock applied sequentially
- 2). Clock applied to all flip-flops simultaneously
- 3). Clock not required
- 4). Clock applied randomly

☒ Correct Answer: 2). Clock applied to all flip-flops simultaneously

Explanation:

Simultaneous triggering reduces propagation delay.

Ref: Digital Design – M. Morris Mano

129. SRAM is faster than DRAM because

- 1). Uses capacitors
- 2). Uses flip-flops
- 3). Requires refreshing
- 4). Uses resistors

☒ Correct Answer: 2). Uses flip-flops

Explanation:

Flip-flop storage enables faster access.

Ref: Digital Electronics – Anil K. Maini

130. DRAM stores data as

- 1). Magnetic field
- 2). Electric charge
- 3). Light pulses
- 4). Current

☒ Correct Answer: 2). Electric charge

Explanation:

Charge stored in capacitors.

Ref: Digital Electronics – Anil K. Maini

131. The accumulator register in 8051 is

- 1). A
- 2). B
- 3). PSW
- 4). SP

☒ Correct Answer: 1). A

Explanation:

Most arithmetic operations occur in accumulator.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

132. The register used with accumulator for multiplication is

- 1). R0
- 2). B
- 3). PSW
- 4). DPTR

☒ Correct Answer: 2). B

Explanation:

MUL AB instruction uses B register.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

133. The instruction MOV A,#45H uses

- 1). Immediate addressing
- 2). Direct addressing
- 3). Indirect addressing
- 4). Indexed addressing

☒ Correct Answer: 1). Immediate addressing

Explanation:

Constant value is loaded into accumulator.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

134. The instruction MOV A,R1 uses

- 1). Immediate addressing
- 2). Register addressing
- 3). Direct addressing
- 4). Indirect addressing

☒ Correct Answer: 2). Register addressing

Explanation:

Data moved from register to accumulator.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

135. Default stack pointer value in 8051 is

- 1). 00H
- 2). 07H
- 3). 10H
- 4). FFH

☒ Correct Answer: 2). 07H

Explanation:

Stack starts after register bank.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

136. Machine cycle of 8051 consists of

- 1). 6 clock cycles
- 2). 12 clock cycles
- 3). 24 clock cycles
- 4). 48 clock cycles

☒ Correct Answer: 2). 12 clock cycles

Explanation:

One machine cycle = 12 oscillator cycles.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

137. DNS converts

- 1). IP address to domain name
- 2). Domain name to IP address
- 3). Port to protocol
- 4). Packet to frame

☒ Correct Answer: 2). Domain name to IP address

Explanation:

DNS resolves domain names.

Ref: Data Communications and Networking – Behrouz A. Forouzan

138. FTP protocol is used for

- 1). File transfer
- 2). Email transfer
- 3). Web browsing
- 4). Remote login

☒ Correct Answer: 1). File transfer

Explanation:

FTP transfers files between computers.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

139. HTTP protocol uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 3). 80

Explanation:

HTTP default port is 80.

Ref: Computer Networking – Kurose and Ross

140. SMTP protocol is used for

- 1). Sending email
- 2). Receiving email
- 3). File transfer
- 4). Web browsing

✓ Correct Answer: 1). Sending email

Explanation:

SMTP handles outgoing mail.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

141. Router works at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 3). Network layer

Explanation:

Router forwards packets based on IP address.

Ref: Computer Networks – Andrew S. Tanenbaum

142. Switch works at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 2). Data link layer

Explanation:

Switch forwards frames using MAC address.

Ref: Data Communications and Networking – Forouzan

143. Hub works at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 1). Physical layer

Explanation:

Hub repeats signals without processing.

Ref: Computer Networks – Andrew S. Tanenbaum

144. Bluetooth network is called

- 1). Subnet
- 2). Piconet
- 3). Cluster
- 4). Mesh

✓ Correct Answer: 2). Piconet

Explanation:

Bluetooth devices form a small network called piconet.

Ref: Data Communications and Networking – Forouzan

145. WLAN standard is

- 1). IEEE 802.3
- 2). IEEE 802.5
- 3). IEEE 802.11
- 4). IEEE 802.15

✓ Correct Answer: 3). IEEE 802.11

Explanation:

802.11 defines wireless LAN standard.

Ref: Computer Networking – Kurose and Ross

146. Shannon capacity theorem determines

- 1). Channel capacity
- 2). Signal voltage
- 3). Signal frequency
- 4). Signal amplitude

✓ Correct Answer: 1). Channel capacity

Explanation:

Defines maximum data rate of channel.

Ref: Data Communications and Networking – Forouzan

147. The Internet is an example of

- 1). LAN
- 2). WAN
- 3). PAN
- 4). MAN

✓ Correct Answer: 2). WAN

Explanation:

Internet connects networks globally.

Ref: Computer Networks – Andrew S. Tanenbaum

148. Network topology refers to

- 1). Cable type
- 2). Physical arrangement of network devices
- 3). Signal frequency
- 4). Protocol type

✓ Correct Answer: 2). Physical arrangement of network devices

Explanation:

Topology defines network layout.

Ref: Data Communications and Networking – Forouzan

149. In packet switching data is transmitted as

- 1). Frames
- 2). Packets
- 3). Messages
- 4). Signals

✓ Correct Answer: 2). Packets

Explanation:

Data divided into small packets.

Ref: Computer Networks – Andrew S. Tanenbaum

150. The main goal of computer networking is

- 1). Data storage
- 2). Resource sharing
- 3). Signal amplification
- 4). Signal generation

✓ Correct Answer: 2). Resource sharing

Explanation:

Networking enables communication and sharing of resources.

Ref: Data Communications and Networking – Forouzan

161. In mesh analysis the basic law used is

- 1). KCL
- 2). KVL
- 3). Ohm's law
- 4). Faraday's law

✓ Correct Answer: 2). KVL

Explanation:

Mesh analysis applies Kirchhoff's Voltage Law around loops.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

162. In nodal analysis the basic law used is

- 1). KVL
- 2). KCL
- 3). Ohm's law
- 4). Faraday's law

✓ Correct Answer: 2). KCL

Explanation:

Nodal analysis applies Kirchhoff's Current Law at nodes.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

163. Thevenin equivalent voltage is

- 1). Short circuit voltage
- 2). Open circuit voltage
- 3). Average voltage
- 4). RMS voltage

✓ Correct Answer: 2). Open circuit voltage

Explanation:

Thevenin voltage equals open circuit terminal voltage.

Ref: Network Analysis – M.E. Van Valkenburg

164. Norton current equals

- 1). Open circuit current
- 2). Short circuit current
- 3). Average current
- 4). RMS current

✓ Correct Answer: 2). Short circuit current

Explanation:

Norton current equals current through shorted output terminals.

Ref: Network Analysis – M.E. Van Valkenburg

165. Maximum power transfer occurs when

- 1). $R_L = R_{th}$
- 2). $R_L = 0$
- 3). $R_L = 2R_{th}$
- 4). $R_L = R_{th}/2$

✓ Correct Answer: 1). $R_L = R_{th}$

Explanation:

Maximum power delivered when load equals Thevenin resistance.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

166. Quality factor of resonant circuit is defined as

- 1). f_r/BW
- 2). BW/f_r
- 3). f_r^2/BW
- 4). BW^2/f_r

✓ Correct Answer: 1). f_r/BW

Explanation:

Q factor indicates selectivity.

Ref: Circuits and Networks – A. Sudhakar and Shyammohan S. Palli

167. Bandwidth of resonant circuit equals

- 1). f_r/Q
- 2). Q/f_r
- 3). $f_r \times Q$
- 4). Q^2/f_r

✓ Correct Answer: 1). f_r/Q

Explanation:

Bandwidth inversely proportional to Q factor.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

168. Time constant of RC circuit equals

- 1). R/C
- 2). RC
- 3). $1/RC$
- 4). $\sqrt{RC}$

✓ Correct Answer: 2). RC

Explanation:

RC product determines transient response.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

169. Time constant of RL circuit equals

- 1). R/L
- 2). L/R
- 3). LR
- 4). $\sqrt{LR}$

✓ Correct Answer: 2). L/R

Explanation:

RL time constant equals inductance divided by resistance.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

170. Characteristic impedance of transmission line is

- 1). $\sqrt{L/C}$
- 2). $\sqrt{C/L}$
- 3). L/C
- 4). C/L

✓ Correct Answer: 1). $\sqrt{L/C}$

Explanation:

Characteristic impedance depends on line inductance and capacitance.

Ref: Networks, Lines and Fields – John D. Ryder

171. Standing wave ratio indicates

- 1). Signal power
- 2). Impedance mismatch
- 3). Frequency shift
- 4). Phase shift

✓ Correct Answer: 2). Impedance mismatch

Explanation:

SWR measures reflections in transmission line.

Ref: Networks, Lines and Fields – John D. Ryder

172. CRO is mainly used to

- 1). Measure resistance
- 2). Display waveform
- 3). Measure inductance
- 4). Measure power

✓ Correct Answer: 2). Display waveform

Explanation:

CRO displays electrical signals visually.

Ref: Electronic Instrumentation – H.S. Kalsi

173. The vertical amplifier in CRO controls

- 1). Horizontal sweep
- 2). Vertical deflection
- 3). Beam intensity
- 4). Beam focus

✓ Correct Answer: 2). Vertical deflection

Explanation:

Vertical amplifier determines amplitude of waveform.

Ref: Electronic Devices and Circuits – David A. Bell

174. Dual slope ADC works on

- 1). Binary search
- 2). Integration principle
- 3). Parallel comparison
- 4). Counting method

✓ Correct Answer: 2). Integration principle

Explanation:

Dual slope ADC integrates input then reference voltage.

Ref: Electronic Instrumentation – H.S. Kalsi

175. Successive approximation ADC works using

- 1). Binary search algorithm
- 2). Parallel conversion
- 3). Counting method
- 4). Ramp method

✓ Correct Answer: 1). Binary search algorithm

Explanation:

Each bit determined sequentially.

Ref: Electronic Instrumentation – H.S. Kalsi

176. SCR is a

- 1). Three layer device
- 2). Four layer device
- 3). Two layer device
- 4). Five layer device

✓ Correct Answer: 2). Four layer device

Explanation:

SCR structure is PNPN.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

177. TRIAC conducts

- 1). Only positive half cycle
- 2). Only negative half cycle
- 3). Both directions
- 4). No direction

✓ Correct Answer: 3). Both directions

Explanation:

TRIAC controls AC power in both directions.

Ref: Power Electronics – P.S. Bimbhra

178. IGBT combines features of

- 1). BJT and MOSFET
- 2). SCR and diode
- 3). FET and diode
- 4). BJT and SCR

✓ Correct Answer: 1). BJT and MOSFET

Explanation:

IGBT has MOSFET gate and BJT conduction characteristics.

Ref: Power Electronics – Muhammad H. Rashid

179. LDR resistance

- 1). Decreases with light
- 2). Increases with light
- 3). Remains constant
- 4). Becomes zero

✓ Correct Answer: 1). Decreases with light

Explanation:

Light increases carrier generation.

Ref: Electronic Devices and Circuit Theory – Boylestad

180. LVDT is used to measure

- 1). Pressure
- 2). Temperature
- 3). Linear displacement
- 4). Voltage

☒ Correct Answer: 3). Linear displacement

Explanation:

LVDT converts displacement into electrical signal.

Ref: A Course in Electrical and Electronic Measurements – A.K. Sawhney

181. Thermistor is used for

- 1). Temperature sensing
- 2). Pressure sensing
- 3). Voltage sensing
- 4). Current sensing

☒ Correct Answer: 1). Temperature sensing

Explanation:

Thermistor resistance changes with temperature.

Ref: Industrial Electronics – G.K. Mithal

182. Ultrasonic waves have frequency

- 1). < 20 Hz
- 2). < 20 kHz
- 3). > 20 kHz
- 4). > 1 MHz

☒ Correct Answer: 3). > 20 kHz

Explanation:

Above human hearing range.

Ref: Industrial Electronics – G.K. Mithal

183. Ultrasonic flaw detector is used for

- 1). Material testing
- 2). Temperature measurement
- 3). Voltage measurement
- 4). Current measurement

✓ Correct Answer: 1). Material testing

Explanation:

Detects internal cracks.

Ref: Industrial Electronics – G.K. Mithal

184. Induction heating works on

- 1). Eddy currents
- 2). Electrostatic fields
- 3). Magnetic fields only
- 4). DC current

✓ Correct Answer: 1). Eddy currents

Explanation:

AC magnetic field induces currents.

Ref: Industrial Electronics – G.K. Mithal

185. Transfer function equals

- 1). Input/output
- 2). Output/input
- 3). Voltage/current
- 4). Current/voltage

✓ Correct Answer: 2). Output/input

Explanation:

Defined in Laplace domain.

Ref: Control Systems Engineering – I.J. Nagrath and M. Gopal

186. Closed loop system has

- 1). No feedback
- 2). Feedback
- 3). Oscillation only
- 4). Amplification only

☒ Correct Answer: 2). Feedback

Explanation:

Output fed back to input.

Ref: Control Systems – A. Anand Kumar

187. Open loop system has

- 1). Feedback
- 2). No feedback
- 3). Amplifier
- 4). Oscillator

☒ Correct Answer: 2). No feedback

Explanation:

Output does not affect input.

Ref: Control Systems – A. Anand Kumar

188. Shannon capacity formula is

- 1). $C = B \log_2(1 + S/N)$
- 2). $C = B + S/N$
- 3). $C = B \log(S/N)$
- 4). $C = S/N$

☒ Correct Answer: 1). $C = B \log_2(1 + S/N)$

Explanation:

Defines maximum theoretical channel capacity.

Ref: Data Communications and Networking – Behrouz A. Forouzan

189. OSI model has

- 1). 5 layers
- 2). 6 layers
- 3). 7 layers
- 4). 8 layers

✓ Correct Answer: 3). 7 layers

Explanation:

Seven layer networking model.

Ref: Computer Networks – Andrew S. Tanenbaum

190. Physical layer deals with

- 1). Routing
- 2). Bit transmission
- 3). Error control
- 4). Encryption

✓ Correct Answer: 2). Bit transmission

Explanation:

Handles raw bit transfer.

Ref: Data Communications and Networking – Forouzan

191. Data link layer performs

- 1). Routing
- 2). Error detection
- 3). Encryption
- 4). Compression

✓ Correct Answer: 2). Error detection

Explanation:

Ensures error-free frame transmission.

Ref: Computer Networks – Andrew S. Tanenbaum

192. Network layer performs

- 1). Routing
- 2). Error correction
- 3). Signal generation
- 4). Compression

✓ Correct Answer: 1). Routing

Explanation:

Determines packet path.

Ref: Data Communications and Networking – Forouzan

193. Transport layer ensures

- 1). Reliable communication
- 2). Signal amplification
- 3). Routing
- 4). Modulation

✓ Correct Answer: 1). Reliable communication

Explanation:

Handles end-to-end delivery.

Ref: Computer Networking – Kurose and Ross

194. Application layer provides

- 1). User services
- 2). Routing
- 3). Signal transmission
- 4). Error detection

✓ Correct Answer: 1). User services

Explanation:

Interface for applications.

Ref: Data Communications and Networking – Forouzan

195. Bus topology uses

- 1). Single backbone cable
- 2). Hub
- 3). Ring
- 4). Mesh

✓ Correct Answer: 1). Single backbone cable

Explanation:

All devices share one cable.

Ref: Computer Networks – Andrew S. Tanenbaum

196. Star topology uses

- 1). Backbone cable
- 2). Hub
- 3). Ring
- 4). Mesh

✓ Correct Answer: 2). Hub

Explanation:

All nodes connect to central hub.

Ref: Data Communications and Networking – Forouzan

197. Ring topology forms

- 1). Loop network
- 2). Tree network
- 3). Star network
- 4). Bus network

✓ Correct Answer: 1). Loop network

Explanation:

Nodes connected in circular fashion.

Ref: Computer Networks – Andrew S. Tanenbaum

198. Packet switching sends

- 1). Entire message
- 2). Packets
- 3). Analog signals
- 4). Frames only

✓ Correct Answer: 2). Packets

Explanation:

Data divided into packets.

Ref: Data Communications and Networking – Forouzan

199. Internet is example of

- 1). LAN
- 2). WAN
- 3). PAN
- 4). MAN

✓ Correct Answer: 2). WAN

Explanation:

Global wide area network.

Ref: Computer Networks – Andrew S. Tanenbaum

200. Main advantage of networking is

- 1). Data storage
- 2). Resource sharing
- 3). Signal amplification
- 4). Power distribution

✓ Correct Answer: 2). Resource sharing

Explanation:

Networks allow sharing of hardware and information.

Ref: Data Communications and Networking – Behrouz A. Forouzan

APE CET – 2026
Electronics and Communication Engineering
Grand Test - 3

101. The reverse saturation current in a diode mainly depends on

- 1). Applied voltage
- 2). Temperature
- 3). Load resistance
- 4). Input frequency

☒ Correct Answer: 2). Temperature

Explanation:

Reverse saturation current increases significantly with temperature due to increased carrier generation.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

102. A varactor diode is mainly used for

- 1). Rectification
- 2). Voltage regulation
- 3). Voltage controlled capacitance
- 4). Current amplification

☒ Correct Answer: 3). Voltage controlled capacitance

Explanation:

Varactor diode operates in reverse bias where junction capacitance varies with voltage.

Ref: Electronic Devices and Circuits – David A. Bell

103. The phase difference between input and output in CE amplifier is

- 1). 0°
- 2). 90°
- 3). 180°
- 4). 360°

☒ Correct Answer: 3). 180°

Explanation:

CE amplifier inverts the signal resulting in 180° phase shift.

Ref: Electronic Principles – Albert Malvino and David J. Bates

104. The most commonly used filter in power supply is

- 1). RC filter
- 2). LC filter
- 3). CLC filter
- 4). Capacitor filter

☒ Correct Answer: 4). Capacitor filter

Explanation:

Capacitor filters effectively reduce ripple in rectifier outputs.

Ref: Electronic Devices and Circuit Theory – Boylestad

105. The Q-point of transistor amplifier refers to

- 1). Cut-off point
- 2). Saturation point
- 3). Quiescent operating point
- 4). Maximum output point

☒ Correct Answer: 3). Quiescent operating point

Explanation:

Q-point represents the DC operating point of the transistor.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

106. Differential amplifiers are mainly used in

- 1). Rectifiers
- 2). Operational amplifiers
- 3). Oscillators
- 4). Filters

☒ Correct Answer: 2). Operational amplifiers

Explanation:

Op-amps use differential input stage.

Ref: Microelectronic Circuits – Adel S. Sedra and Kenneth C. Smith

107. An ideal op-amp has input impedance

- 1). Zero
- 2). Low
- 3). Infinite
- 4). Moderate

☒ Correct Answer: 3). Infinite

Explanation:

Ideal op-amp draws no input current.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

108. The output impedance of ideal op-amp is

- 1). Infinite
- 2). Very high
- 3). Zero
- 4). Moderate

☒ Correct Answer: 3). Zero

Explanation:

Ideal op-amp behaves as ideal voltage source.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

109. Crystal oscillators are preferred because of

- 1). High gain
- 2). High stability
- 3). Low frequency
- 4). Low cost

☒ Correct Answer: 2). High stability

Explanation:

Quartz crystals maintain precise frequency.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

110. Astable multivibrator produces

- 1). One stable state
- 2). Two stable states
- 3). Continuous square wave
- 4). Single pulse

☒ Correct Answer: 3). Continuous square wave

Explanation:

Astable multivibrator oscillates continuously.

Ref: Pulse and Digital Circuits – A. Anand Kumar

111. Monostable multivibrator has

- 1). No stable state
- 2). One stable state
- 3). Two stable states
- 4). Infinite states

☒ Correct Answer: 2). One stable state

Explanation:

Monostable has one stable and one quasi-stable state.

Ref: Pulse and Digital Circuits – A. Anand Kumar

112. Schmitt trigger is used for

- 1). Amplification
- 2). Wave shaping
- 3). Rectification
- 4). Oscillation

☒ Correct Answer: 2). Wave shaping

Explanation:

Schmitt trigger converts noisy signals into square waves.

Ref: Pulse, Digital and Switching Waveforms – Millman and Taub

113. Miller sweep circuit is used to generate

- 1). Square wave
- 2). Sinusoidal wave
- 3). Linear ramp waveform
- 4). Pulse waveform

✓ Correct Answer: 3). Linear ramp waveform

Explanation:

Miller circuit produces linear voltage sweep.

Ref: Pulse, Digital and Switching Waveforms – Millman and Taub

114. In mesh analysis the number of equations equals

- 1). Number of nodes
- 2). Number of loops
- 3). Number of branches
- 4). Number of resistors

✓ Correct Answer: 2). Number of loops

Explanation:

Each mesh produces one KVL equation.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

115. In nodal analysis number of equations equals

- 1). Number of nodes – 1
- 2). Number of branches
- 3). Number of loops
- 4). Number of resistors

✓ Correct Answer: 1). Number of nodes – 1

Explanation:

One node selected as reference.

Ref: Fundamentals of Electric Circuits – Alexander and Sadiku

116. The unit of Q-factor is

- 1). Ohm
- 2). Henry
- 3). Farad
- 4). Dimensionless

☒ Correct Answer: 4). Dimensionless

Explanation:

Q-factor is ratio of stored energy to energy loss.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

117. Selectivity of resonant circuit increases with

- 1). Lower Q
- 2). Higher Q
- 3). Higher resistance
- 4). Lower inductance

☒ Correct Answer: 2). Higher Q

Explanation:

Higher Q means sharper resonance.

Ref: Circuits and Networks – A. Sudhakar and Shyammmohan Palli

118. The time constant of RC circuit determines

- 1). Amplitude
- 2). Frequency
- 3). Charging rate
- 4). Voltage

☒ Correct Answer: 3). Charging rate

Explanation:

Time constant determines exponential response speed.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

119. In CRO, deflection sensitivity is defined as

- 1). Voltage per division
- 2). Displacement per volt
- 3). Time per division
- 4). Frequency per division

☒ Correct Answer: 2). Displacement per volt

Explanation:

Measures beam displacement due to input voltage.

Ref: Electronic Instrumentation – H.S. Kalsi

120. Ramp type ADC is also called

- 1). Flash ADC
- 2). Counter ADC
- 3). Successive ADC
- 4). Dual slope ADC

☒ Correct Answer: 2). Counter ADC

Explanation:

Ramp ADC uses counter and DAC.

Ref: Electronic Instrumentation – H.S. Kalsi

121. The decimal equivalent of hexadecimal number $(2F)_{16}$ is

- 1). 45
- 2). 46
- 3). 47
- 4). 48

☒ Correct Answer: 3). 47

Explanation:

$$2F_{16} = 2 \times 16 + 15 = 32 + 15 = 47.$$

Ref: Digital Fundamentals – Thomas L. Floyd

122. The output of NOR gate is 1 when

- 1). Both inputs are 1
- 2). Both inputs are 0
- 3). Inputs are different
- 4). Any input is 1

☒ Correct Answer: 2). Both inputs are 0

Explanation:

NOR = NOT(OR). OR output becomes 0 only when both inputs are 0.

Ref: Modern Digital Electronics – R.P. Jain

123. A half adder produces

- 1). Sum and carry
- 2). Difference and borrow
- 3). Only sum
- 4). Only carry

☒ Correct Answer: 1). Sum and carry

Explanation:

Half adder adds two binary digits and produces sum and carry.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

124. A full adder requires how many inputs

- 1). 2
- 2). 3
- 3). 4
- 4). 5

☒ Correct Answer: 2). 3

Explanation:

Inputs are A, B and Carry-in.

Ref: Digital Design – M. Morris Mano

125. The number of flip-flops required for MOD-64 counter is

- 1). 4
- 2). 5
- 3). 6
- 4). 7

☒ Correct Answer: 3). 6

Explanation:

$2^6 = 64$ states.

Ref: Modern Digital Electronics – R.P. Jain

126. The resolution of n-bit DAC is

- 1). $1/(2^n)$
- 2). $1/(2^n - 1)$
- 3). $1/2^{n^2}$
- 4). $1/(n^2)$

☒ Correct Answer: 2). $1/(2^n - 1)$

Explanation:

Resolution defines smallest output change.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

127. A 5-variable K-map contains

- 1). 16 cells
- 2). 24 cells
- 3). 32 cells
- 4). 64 cells

☒ Correct Answer: 3). 32 cells

Explanation:

Cells = $2^5 = 32$.

Ref: Fundamentals of Digital Circuits – A. Anand Kumar

128. Ripple counter is also called

- 1). Synchronous counter
- 2). Asynchronous counter
- 3). Binary counter
- 4). Parallel counter

☒ Correct Answer: 2). Asynchronous counter

Explanation:

Clock propagates sequentially through flip-flops.

Ref: Digital Design – M. Morris Mano

129. The memory which retains data without power is

- 1). RAM
- 2). DRAM
- 3). SRAM
- 4). ROM

☒ Correct Answer: 4). ROM

Explanation:

ROM stores permanent data.

Ref: Digital Electronics – Anil K. Maini

130. Flash memory is

- 1). Volatile memory
- 2). Non-volatile memory
- 3). Temporary memory
- 4). Cache memory

☒ Correct Answer: 2). Non-volatile memory

Explanation:

Flash memory retains data even without power.

Ref: Digital Electronics – Anil K. Maini

131. The data pointer register in 8051 is

- 1). ACC
- 2). B
- 3). DPTR
- 4). PSW

☒ Correct Answer: 3). DPTR

Explanation:

DPTR is 16-bit register used for addressing external memory.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

132. The instruction used to multiply numbers in 8051 is

- 1). ADD
- 2). MUL AB
- 3). DIV AB
- 4). INC

☒ Correct Answer: 2). MUL AB

Explanation:

Multiplication performed using accumulator and B register.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

133. The instruction DIV AB divides

- 1). B by A
- 2). A by B
- 3). A by R0
- 4). B by R1

☒ Correct Answer: 2). A by B

Explanation:

Quotient stored in A and remainder in B.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

134. The number of timers in 8051 is

- 1). 1
- 2). 2
- 3). 3
- 4). 4

☒ Correct Answer: 2). 2

Explanation:

Timer-0 and Timer-1 available.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

135. Timer mode register in 8051 is

- 1). TCON
- 2). TMOD
- 3). PSW
- 4). SCON

☒ Correct Answer: 2). TMOD

Explanation:

TMOD selects timer modes.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

136. Bluetooth operates in

- 1). 900 MHz band
- 2). 2.4 GHz band
- 3). 5 GHz band
- 4). 10 GHz band

☒ Correct Answer: 2). 2.4 GHz band

Explanation:

Bluetooth uses ISM band.

Ref: Data Communications and Networking – Behrouz A. Forouzan

137. WLAN operates under standard

- 1). IEEE 802.3
- 2). IEEE 802.5
- 3). IEEE 802.11
- 4). IEEE 802.15

☒ Correct Answer: 3). IEEE 802.11

Explanation:

Defines wireless LAN communication.

Ref: Computer Networking – Kurose and Ross

138. ARPANET is considered

- 1). First LAN
- 2). First WAN
- 3). First Internet prototype
- 4). First router

☒ Correct Answer: 3). First Internet prototype

Explanation:

ARPANET led to development of Internet.

Ref: Computer Networks – Andrew S. Tanenbaum

139. TCP provides

- 1). Unreliable connection
- 2). Reliable connection
- 3). Broadcast communication
- 4). Multicast communication

☒ Correct Answer: 2). Reliable connection

Explanation:

TCP ensures reliable packet delivery.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

140. UDP provides

- 1). Reliable communication
- 2). Connectionless communication
- 3). Error correction
- 4). Congestion control

✓ Correct Answer: 2). Connectionless communication

Explanation:

UDP sends packets without establishing connection.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

141. Router uses

- 1). MAC address
- 2). IP address
- 3). Port number
- 4). Domain name

✓ Correct Answer: 2). IP address

Explanation:

Routing decisions based on IP address.

Ref: Computer Networks – Andrew S. Tanenbaum

142. Switch forwards data using

- 1). MAC address
- 2). IP address
- 3). Port number
- 4). Domain name

✓ Correct Answer: 1). MAC address

Explanation:

Switch operates at data link layer.

Ref: Data Communications and Networking – Forouzan

143. Hub works at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

☒ Correct Answer: 1). Physical layer

Explanation:

Hub simply repeats signals.

Ref: Computer Networks – Andrew S. Tanenbaum

144. Frame relay is

- 1). Circuit switching
- 2). Packet switching
- 3). Optical communication
- 4). Satellite communication

☒ Correct Answer: 2). Packet switching

Explanation:

Frame relay uses packet switching technology.

Ref: Data Communications and Networking – Forouzan

145. ATM cell size is

- 1). 48 bytes
- 2). 53 bytes
- 3). 64 bytes
- 4). 128 bytes

☒ Correct Answer: 2). 53 bytes

Explanation:

48 byte payload + 5 byte header.

Ref: Data and Computer Communications – William Stallings

146. DNS translates

- 1). Domain name to IP address
- 2). IP address to MAC address
- 3). Port number to protocol
- 4). Packet to frame

☒ Correct Answer: 1). Domain name to IP address

Explanation:

DNS resolves domain names.

Ref: Computer Networks – Andrew S. Tanenbaum

147. FTP uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 1). 21

Explanation:

FTP control port is 21.

Ref: TCP/IP Protocol Suite – Forouzan

148. SMTP uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 2). 25

Explanation:

SMTP transfers outgoing mail.

Ref: TCP/IP Protocol Suite – Forouzan

149. POP3 uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 4). 110

Explanation:

POP3 retrieves emails.

Ref: Computer Networking – Kurose and Ross

150. HTTP protocol transfers

- 1). Email messages
- 2). Web pages
- 3). Files
- 4). DNS queries

☒ Correct Answer: 2). Web pages

Explanation:

HTTP transfers hypertext documents.

Ref: Computer Networks – Andrew S. Tanenbaum

161. In mesh current analysis the governing law is

- 1). Kirchhoff's Current Law
- 2). Kirchhoff's Voltage Law
- 3). Ohm's Law
- 4). Faraday's Law

☒ Correct Answer: 2). Kirchhoff's Voltage Law

Explanation:

Mesh analysis uses KVL around closed loops to determine currents.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

162. In nodal analysis the governing law is

- 1). KVL
- 2). KCL
- 3). Ohm's law
- 4). Coulomb's law

☒ Correct Answer: 2). KCL

Explanation:

Node voltage analysis applies Kirchhoff's Current Law at nodes.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

163. Thevenin resistance is determined by

- 1). Removing voltage sources
- 2). Replacing voltage sources with short circuits
- 3). Replacing current sources with open circuits
- 4). Both 2 and 3

☒ Correct Answer: 4). Both 2 and 3

Explanation:

Independent voltage sources are shorted and current sources opened.

Ref: Network Analysis – M.E. Van Valkenburg

164. Norton equivalent current equals

- 1). Open circuit current
- 2). Short circuit current
- 3). Average current
- 4). RMS current

☒ Correct Answer: 2). Short circuit current

Explanation:

Norton current equals current through shorted output terminals.

Ref: Network Analysis – M.E. Van Valkenburg

165. Maximum power transfer occurs when

- 1). $R_L = R_{th}$
- 2). $R_L = 0$
- 3). $R_L = 2R_{th}$
- 4). $R_L = R_{th}/2$

☒ Correct Answer: 1). $R_L = R_{th}$

Explanation:

Load resistance must equal source resistance.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

166. The unit of bandwidth is

- 1). Volt
- 2). Hertz
- 3). Ampere
- 4). Ohm

☒ Correct Answer: 2). Hertz

Explanation:

Bandwidth represents frequency range.

Ref: Circuits and Networks – A. Sudhakar and Shyammmohan S. Palli

167. Q-factor of resonant circuit is

- 1). f_r/BW
- 2). BW/f_r
- 3). f_r^2/BW
- 4). BW^2/f_r

☒ Correct Answer: 1). f_r/BW

Explanation:

Q-factor measures selectivity of resonant circuit.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

168. Time constant of RC circuit equals

- 1). R/C
- 2). RC
- 3). $1/RC$
- 4). $\sqrt{RC}$

✓ Correct Answer: 2). RC

Explanation:

RC product determines charging/discharging time.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

169. Time constant of RL circuit equals

- 1). R/L
- 2). L/R
- 3). LR
- 4). $\sqrt{LR}$

✓ Correct Answer: 2). L/R

Explanation:

RL time constant equals inductance divided by resistance.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

170. Characteristic impedance of transmission line is

- 1). $\sqrt{L/C}$
- 2). $\sqrt{C/L}$
- 3). L/C
- 4). C/L

✓ Correct Answer: 1). $\sqrt{L/C}$

Explanation:

Depends on inductance and capacitance per unit length.

Ref: Networks, Lines and Fields – John D. Ryder

171. Standing wave ratio indicates

- 1). Signal voltage
- 2). Impedance mismatch
- 3). Signal frequency
- 4). Signal amplitude

☒ Correct Answer: 2). Impedance mismatch

Explanation:

SWR indicates reflection in transmission line.

Ref: Networks, Lines and Fields – John D. Ryder

172. CRO is mainly used for

- 1). Measuring resistance
- 2). Displaying waveforms
- 3). Measuring power
- 4). Measuring capacitance

☒ Correct Answer: 2). Displaying waveforms

Explanation:

Oscilloscope visually displays electrical signals.

Ref: Electronic Instrumentation – H.S. Kalsi

173. Vertical deflection in CRO is produced by

- 1). Time base generator
- 2). Vertical amplifier
- 3). Horizontal amplifier
- 4). Power supply

☒ Correct Answer: 2). Vertical amplifier

Explanation:

Vertical amplifier determines signal amplitude.

Ref: Electronic Devices and Circuits – David A. Bell

174. Dual slope ADC works on

- 1). Integration principle
- 2). Binary search
- 3). Parallel conversion
- 4). Counting method

☒ Correct Answer: 1). Integration principle

Explanation:

Dual integration improves accuracy.

Ref: Electronic Instrumentation – H.S. Kalsi

175. Successive approximation ADC uses

- 1). Binary search
- 2). Parallel comparison
- 3). Ramp method
- 4). Random method

☒ Correct Answer: 1). Binary search

Explanation:

Determines digital output bit by bit.

Ref: Electronic Instrumentation – H.S. Kalsi

176. SCR structure is

- 1). PN junction
- 2). PNP transistor
- 3). PNPN device
- 4). NPN transistor

☒ Correct Answer: 3). PNPN device

Explanation:

SCR has four semiconductor layers.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

177. TRIAC conducts

- 1). Only positive half cycle
- 2). Only negative half cycle
- 3). Both directions
- 4). No direction

☒ Correct Answer: 3). Both directions

Explanation:

TRIAC controls AC power in both directions.

Ref: Power Electronics – P.S. Bimbhra

178. IGBT is mainly used in

- 1). Low power circuits
- 2). High power switching
- 3). Audio amplifiers
- 4). Rectifiers

☒ Correct Answer: 2). High power switching

Explanation:

IGBT used in power converters and drives.

Ref: Power Electronics – Muhammad H. Rashid

179. LDR resistance

- 1). Increases with light
- 2). Decreases with light
- 3). Remains constant
- 4). Becomes infinite

☒ Correct Answer: 2). Decreases with light

Explanation:

Light increases charge carriers.

Ref: Electronic Devices and Circuit Theory – Boylestad

180. Thermocouple works on

- 1). Seebeck effect
- 2). Hall effect
- 3). Photoelectric effect
- 4). Faraday effect

☒ Correct Answer: 1). Seebeck effect

Explanation:

Voltage generated due to temperature difference.

Ref: A Course in Electrical and Electronic Measurements – A.K. Sawhney

181. Ultrasonic waves have frequency

- 1). Below 20 Hz
- 2). Below 20 kHz
- 3). Above 20 kHz
- 4). Above 1 MHz

☒ Correct Answer: 3). Above 20 kHz

Explanation:

Beyond audible range.

Ref: Industrial Electronics – G.K. Mithal

182. Ultrasonic flaw detector detects

- 1). Temperature
- 2). Internal cracks
- 3). Voltage
- 4). Current

☒ Correct Answer: 2). Internal cracks

Explanation:

Pulse echo technique used.

Ref: Industrial Electronics – G.K. Mithal

183. Induction heating uses

- 1). Electrostatic field
- 2). Eddy currents
- 3). Direct current
- 4). Capacitive current

✓ Correct Answer: 2). Eddy currents

Explanation:

Alternating magnetic field induces eddy currents.

Ref: Industrial Electronics – G.K. Mithal

184. Transfer function equals

- 1). Output/Input
- 2). Input/Output
- 3). Voltage/Current
- 4). Current/Voltage

✓ Correct Answer: 1). Output/Input

Explanation:

Expressed in Laplace domain.

Ref: Control Systems Engineering – I.J. Nagrath and M. Gopal

185. Closed loop system includes

- 1). Feedback
- 2). No feedback
- 3). Amplifier only
- 4). Oscillator only

✓ Correct Answer: 1). Feedback

Explanation:

Output influences input.

Ref: Control Systems – A. Anand Kumar

186. Open loop system has

- 1). Feedback
- 2). No feedback
- 3). Oscillation
- 4). Amplification

☒ Correct Answer: 2). No feedback

Explanation:

Output independent of input.

Ref: Control Systems – A. Anand Kumar

187. Shannon theorem gives

- 1). Maximum channel capacity
- 2). Signal frequency
- 3). Signal amplitude
- 4). Signal power

☒ Correct Answer: 1). Maximum channel capacity

Explanation:

Defines maximum theoretical data rate.

Ref: Data Communications and Networking – Behrouz A. Forouzan

188. OSI model consists of

- 1). 5 layers
- 2). 6 layers
- 3). 7 layers
- 4). 8 layers

☒ Correct Answer: 3). 7 layers

Explanation:

OSI model standardizes network communication.

Ref: Computer Networks – Andrew S. Tanenbaum

189. Physical layer deals with

- 1). Routing
- 2). Bit transmission
- 3). Encryption
- 4). Error detection

☒ Correct Answer: 2). Bit transmission

Explanation:

Handles physical transmission of data.

Ref: Data Communications and Networking – Forouzan

190. Data link layer handles

- 1). Routing
- 2). Error detection
- 3). Signal generation
- 4). Compression

☒ Correct Answer: 2). Error detection

Explanation:

Ensures reliable frame delivery.

Ref: Computer Networks – Andrew S. Tanenbaum

191. Network layer performs

- 1). Routing
- 2). Encryption
- 3). Signal amplification
- 4). Compression

☒ Correct Answer: 1). Routing

Explanation:

Determines path for packets.

Ref: Data Communications and Networking – Forouzan

192. Transport layer ensures

- 1). Reliable communication
- 2). Signal generation
- 3). Packet switching
- 4). Signal amplification

✓ Correct Answer: 1). Reliable communication

Explanation:

Handles end-to-end delivery.

Ref: Computer Networking – Kurose and Ross

193. Application layer provides

- 1). User services
- 2). Routing
- 3). Encryption
- 4). Signal generation

✓ Correct Answer: 1). User services

Explanation:

Interface between applications and network.

Ref: Data Communications and Networking – Forouzan

194. Bus topology uses

- 1). Single backbone cable
- 2). Central hub
- 3). Ring connection
- 4). Mesh structure

✓ Correct Answer: 1). Single backbone cable

Explanation:

All devices share a common cable.

Ref: Computer Networks – Andrew S. Tanenbaum

195. Star topology uses

- 1). Backbone cable
- 2). Hub
- 3). Ring cable
- 4). Mesh network

✓ Correct Answer: 2). Hub

Explanation:

All nodes connected to central hub.

Ref: Data Communications and Networking – Forouzan

196. Ring topology forms

- 1). Closed loop
- 2). Tree structure
- 3). Star network
- 4). Bus network

✓ Correct Answer: 1). Closed loop

Explanation:

Nodes connected in circular structure.

Ref: Computer Networks – Andrew S. Tanenbaum

197. Packet switching transmits

- 1). Entire message
- 2). Packets
- 3). Analog signals
- 4). Frames only

✓ Correct Answer: 2). Packets

Explanation:

Data divided into packets.

Ref: Data Communications and Networking – Forouzan

198. Internet is example of

- 1). LAN
- 2). WAN
- 3). PAN
- 4). MAN

☒ Correct Answer: 2). WAN

Explanation:

Internet is global wide area network.

Ref: Computer Networks – Andrew S. Tanenbaum

199. Networking allows

- 1). Resource sharing
- 2). Power generation
- 3). Signal amplification
- 4). Data storage only

☒ Correct Answer: 1). Resource sharing

Explanation:

Networks allow sharing of files, printers and resources.

Ref: Data Communications and Networking – Forouzan

200. Main purpose of networking is

- 1). Communication
- 2). Amplification
- 3). Signal generation
- 4). Frequency control

☒ Correct Answer: 1). Communication

Explanation:

Networking enables information exchange between devices.

Ref: Data Communications and Networking – Behrouz A. Forouzan

APE CET – 2026
Electronics and Communication Engineering
Grand Test - 4

101. The depletion region in a PN junction is formed due to

- 1). Diffusion of charge carriers
- 2). Drift of carriers
- 3). External voltage
- 4). Temperature increase

☒ Correct Answer: 1). Diffusion of charge carriers

Explanation:

When P and N regions join, electrons and holes diffuse and recombine forming depletion region.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

102. A Zener diode used as voltage regulator is connected in

- 1). Forward bias
- 2). Reverse bias
- 3). Open circuit
- 4). Short circuit

☒ Correct Answer: 2). Reverse bias

Explanation:

Zener operates in reverse breakdown region to maintain constant voltage.

Ref: Electronic Devices and Circuits – Jacob Millman and Christos Halkias

103. In common base configuration the current gain is

- 1). α
- 2). β
- 3). γ
- 4). δ

☒ Correct Answer: 1). α

Explanation:

Current gain in CB configuration is denoted by α .

Ref: Electronic Principles – Albert Malvino and David J. Bates

104. The transistor configuration with highest input impedance is

- 1). CB
- 2). CE
- 3). CC
- 4). CS

☒ Correct Answer: 3). CC

Explanation:

Common collector (emitter follower) provides highest input impedance.

Ref: Electronic Devices and Circuit Theory – Boylestad

105. The ripple factor of half-wave rectifier is

- 1). 0.482
- 2). 1.21
- 3). 0.707
- 4). 2.0

☒ Correct Answer: 2). 1.21

Explanation:

Half wave rectifier has high ripple factor.

Ref: Electronic Devices and Circuits – David A. Bell

106. The efficiency of half-wave rectifier is approximately

- 1). 20.3%
- 2). 40.6%
- 3). 60%
- 4). 81.2%

☒ Correct Answer: 2). 40.6%

Explanation:

Half wave rectifier theoretical efficiency is 40.6%.

Ref: Electronic Devices and Circuit Theory – Boylestad

107. Field Effect Transistor is

- 1). Current controlled device
- 2). Voltage controlled device
- 3). Power controlled device
- 4). Frequency controlled device

☒ Correct Answer: 2). Voltage controlled device

Explanation:

Gate voltage controls drain current.

Ref: Electronic Devices and Circuits – Millman and Halkias

108. UJT stands for

- 1). Unidirectional Junction Transistor
- 2). Universal Junction Transistor
- 3). Unijunction Transistor
- 4). Uniform Junction Transistor

☒ Correct Answer: 3). Unijunction Transistor

Explanation:

UJT is a single PN junction device used in oscillators.

Ref: Electronic Devices and Circuits – David A. Bell

109. RC coupled amplifier is mainly used for

- 1). Audio frequency amplification
- 2). RF amplification
- 3). Power supply regulation
- 4). Oscillation

☒ Correct Answer: 1). Audio frequency amplification

Explanation:

RC coupling is widely used in audio amplifiers.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

110. Negative feedback in amplifiers

- 1). Increases distortion
- 2). Improves stability
- 3). Reduces bandwidth
- 4). Increases noise

✓ Correct Answer: 2). Improves stability

Explanation:

Negative feedback stabilizes gain and reduces distortion.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

111. AM modulation index is defined as

- 1). V_m/V_c
- 2). V_c/V_m
- 3). f_m/f_c
- 4). f_c/f_m

✓ Correct Answer: 1). V_m/V_c

Explanation:

Modulation index equals ratio of modulating voltage to carrier voltage.

Ref: Electronic Communication Systems – George Kennedy

112. The IF frequency of FM receiver is

- 1). 455 kHz
- 2). 10.7 MHz
- 3). 1 MHz
- 4). 100 kHz

✓ Correct Answer: 2). 10.7 MHz

Explanation:

Standard IF frequency for FM receivers.

Ref: Electronic Communication Systems – George Kennedy

113. In PCM the step after sampling is

- 1). Detection
- 2). Quantization
- 3). Amplification
- 4). Modulation

✓ Correct Answer: 2). Quantization

Explanation:

Signal levels approximated to discrete values.

Ref: Digital Communications – Sanjay Sharma

114. FSK stands for

- 1). Frequency Shift Keying
- 2). Frequency Signal Keying
- 3). Fast Shift Keying
- 4). Frequency System Keying

✓ Correct Answer: 1). Frequency Shift Keying

Explanation:

Binary data represented by two different frequencies.

Ref: Digital Communications – Sanjay Sharma

115. Parabolic reflector antenna is used for

- 1). Broadcasting
- 2). Satellite communication
- 3). Audio transmission
- 4). Telephone lines

✓ Correct Answer: 2). Satellite communication

Explanation:

Provides high gain directional beam.

Ref: Antennas and Wave Propagation – John D. Kraus

116. Dominant mode in rectangular waveguide is

- 1). TE₁₀
- 2). TE₀₁
- 3). TM₁₀
- 4). TM₀₁

✓ Correct Answer: 1). TE₁₀

Explanation:

Lowest cutoff frequency mode.

Ref: Microwave Devices and Circuits – Samuel Y. Liao

117. Radar determines

- 1). Distance of object
- 2). Velocity of object
- 3). Direction of object
- 4). All of the above

✓ Correct Answer: 4). All of the above

Explanation:

Radar detects range, direction and velocity.

Ref: Introduction to Radar Systems – Merrill I. Skolnik

118. Optical fiber communication works on

- 1). Reflection
- 2). Refraction
- 3). Total internal reflection
- 4). Diffraction

✓ Correct Answer: 3). Total internal reflection

Explanation:

Light trapped inside fiber core.

Ref: Optical Fiber Communications – Gerd Keiser

119. GSM uses

- 1). FDMA
- 2). TDMA
- 3). CDMA
- 4). OFDM

☒ Correct Answer: 2). TDMA

Explanation:

GSM uses time division multiple access.

Ref: Wireless Communications – Theodore S. Rappaport

120. Binary number $(1110)_2$ in decimal is

- 1). 12
- 2). 13
- 3). 14
- 4). 15

☒ Correct Answer: 3). 14

Explanation:

$$(1110)_2 = 8 + 4 + 2 = 14.$$

Ref: Digital Design – M. Morris Mano

121. The decimal equivalent of binary number $(10011)_2$ is

- 1). 17
- 2). 18
- 3). 19
- 4). 20

☒ Correct Answer: 3). 19

Explanation:

$$(10011)_2 = 1 \times 16 + 0 \times 8 + 0 \times 4 + 1 \times 2 + 1 \times 1 = 19.$$

Ref: Digital Fundamentals – Thomas L. Floyd

122. The Boolean expression $A + A'$ simplifies to

- 1). 0
- 2). A
- 3). 1
- 4). A'

☒ Correct Answer: 3). 1

Explanation:

Complement law of Boolean algebra.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

123. XOR gate output is

- 1). $A + B$
- 2). AB
- 3). $A \oplus B$
- 4). $A'B'$

☒ Correct Answer: 3). $A \oplus B$

Explanation:

XOR outputs HIGH when inputs differ.

Ref: Modern Digital Electronics – R.P. Jain

124. A full adder can be constructed using

- 1). Two half adders and OR gate
- 2). One half adder only
- 3). Two OR gates only
- 4). One XOR gate only

☒ Correct Answer: 1). Two half adders and OR gate

Explanation:

Two half adders generate sum and carry.

Ref: Digital Design – M. Morris Mano

125. MOD-32 counter requires

- 1). 4 flip-flops
- 2). 5 flip-flops
- 3). 6 flip-flops
- 4). 7 flip-flops

☒ Correct Answer: 2). 5 flip-flops

Explanation:

$2^5 = 32$ states.

Ref: Modern Digital Electronics – R.P. Jain

126. Resolution of DAC improves when

- 1). Number of bits increases
- 2). Number of bits decreases
- 3). Frequency increases
- 4). Voltage decreases

☒ Correct Answer: 1). Number of bits increases

Explanation:

More bits give finer quantization.

Ref: Integrated Electronics – Jacob Millman and Christos Halkias

127. A 3-variable K-map contains

- 1). 4 cells
- 2). 8 cells
- 3). 16 cells
- 4). 32 cells

☒ Correct Answer: 2). 8 cells

Explanation:

Number of cells = 2^3 .

Ref: Fundamentals of Digital Circuits – A. Anand Kumar

128. In synchronous counters

- 1). Flip-flops triggered sequentially
- 2). Flip-flops triggered simultaneously
- 3). No clock used
- 4). Random triggering

✓ Correct Answer: 2). Flip-flops triggered simultaneously

Explanation:

Common clock applied to all flip-flops.

Ref: Digital Design – M. Morris Mano

129. SRAM uses

- 1). Capacitors
- 2). Flip-flops
- 3). Resistors
- 4). Inductors

✓ Correct Answer: 2). Flip-flops

Explanation:

Bistable circuits store data.

Ref: Digital Electronics – Anil K. Maini

130. DRAM requires

- 1). Refreshing
- 2). Amplification
- 3). Oscillation
- 4). Filtering

✓ Correct Answer: 1). Refreshing

Explanation:

Capacitors leak charge.

Ref: Digital Electronics – Anil K. Maini

131. The accumulator register in 8051 is

- 1). A
- 2). B
- 3). PSW
- 4). SP

☒ Correct Answer: 1). A

Explanation:

Most operations performed in accumulator.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

132. The instruction used for multiplication in 8051 is

- 1). ADD
- 2). MUL AB
- 3). DIV AB
- 4). INC

☒ Correct Answer: 2). MUL AB

Explanation:

Multiplies contents of A and B registers.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

133. The instruction used for division in 8051 is

- 1). DIV AB
- 2). ADD
- 3). SUBB
- 4). MUL AB

☒ Correct Answer: 1). DIV AB

Explanation:

Divides A by B.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

134. The number of I/O ports in 8051 is

- 1). 2
- 2). 3
- 3). 4
- 4). 5

☒ Correct Answer: 3). 4

Explanation:

Ports P0–P3 available.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

135. Machine cycle of 8051 consists of

- 1). 6 clock cycles
- 2). 12 clock cycles
- 3). 24 clock cycles
- 4). 48 clock cycles

☒ Correct Answer: 2). 12 clock cycles

Explanation:

Standard machine cycle.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

136. Bluetooth operates in

- 1). 900 MHz band
- 2). 2.4 GHz band
- 3). 5 GHz band
- 4). 10 GHz band

☒ Correct Answer: 2). 2.4 GHz band

Explanation:

Bluetooth uses ISM band.

Ref: Data Communications and Networking – Behrouz A. Forouzan

137. WLAN standard is

- 1). IEEE 802.3
- 2). IEEE 802.5
- 3). IEEE 802.11
- 4). IEEE 802.15

☒ Correct Answer: 3). IEEE 802.11

Explanation:

Wireless LAN standard.

Ref: Computer Networking – Kurose and Ross

138. ARPANET is

- 1). First LAN
- 2). First WAN
- 3). First Internet prototype
- 4). First router

☒ Correct Answer: 3). First Internet prototype

Explanation:

ARPANET evolved into Internet.

Ref: Computer Networks – Andrew S. Tanenbaum

139. TCP ensures

- 1). Unreliable communication
- 2). Reliable communication
- 3). Broadcast communication
- 4). Multicast communication

☒ Correct Answer: 2). Reliable communication

Explanation:

TCP ensures error-free transmission.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

140. UDP provides

- 1). Reliable communication
- 2). Connectionless communication
- 3). Error correction
- 4). Congestion control

✓ Correct Answer: 2). Connectionless communication

Explanation:

UDP sends packets without establishing connection.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

141. Router uses

- 1). MAC address
- 2). IP address
- 3). Port number
- 4). Domain name

✓ Correct Answer: 2). IP address

Explanation:

Routing based on logical addressing.

Ref: Computer Networks – Andrew S. Tanenbaum

142. Switch forwards data using

- 1). MAC address
- 2). IP address
- 3). Port number
- 4). Domain name

✓ Correct Answer: 1). MAC address

Explanation:

Switch operates at data link layer.

Ref: Data Communications and Networking – Forouzan

143. Hub operates at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 1). Physical layer

Explanation:

Hub simply repeats signals.

Ref: Computer Networks – Andrew S. Tanenbaum

144. Frame relay uses

- 1). Circuit switching
- 2). Packet switching
- 3). Optical switching
- 4). Satellite switching

✓ Correct Answer: 2). Packet switching

Explanation:

Frame relay transmits packets efficiently.

Ref: Data Communications and Networking – Forouzan

145. ATM cell size is

- 1). 48 bytes
- 2). 53 bytes
- 3). 64 bytes
- 4). 128 bytes

✓ Correct Answer: 2). 53 bytes

Explanation:

48 byte payload + 5 byte header.

Ref: Data and Computer Communications – William Stallings

146. DNS translates

- 1). Domain name to IP address
- 2). IP address to MAC address
- 3). Port number to protocol
- 4). Packet to frame

✓ Correct Answer: 1). Domain name to IP address

Explanation:

DNS resolves domain names.

Ref: Computer Networks – Andrew S. Tanenbaum

147. FTP uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

✓ Correct Answer: 1). 21

Explanation:

FTP control port.

Ref: TCP/IP Protocol Suite – Forouzan

148. SMTP uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

✓ Correct Answer: 2). 25

Explanation:

SMTP sends emails.

Ref: TCP/IP Protocol Suite – Forouzan

149. POP3 uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

✓ Correct Answer: 4). 110

Explanation:

POP3 retrieves email.

Ref: Computer Networking – Kurose and Ross

150. HTTP protocol transfers

- 1). Email messages
- 2). Web pages
- 3). Files
- 4). DNS queries

✓ Correct Answer: 2). Web pages

Explanation:

HTTP transfers hypertext documents.

Ref: Computer Networks – Andrew S. Tanenbaum

161. In mesh current analysis the governing law used is

- 1). Kirchhoff's Current Law
- 2). Kirchhoff's Voltage Law
- 3). Ohm's Law
- 4). Coulomb's Law

✓ Correct Answer: 2). Kirchhoff's Voltage Law

Explanation:

Mesh analysis applies KVL around closed loops to determine loop currents.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

162. In nodal analysis the governing law used is

- 1). Kirchhoff's Voltage Law
- 2). Kirchhoff's Current Law
- 3). Ohm's Law
- 4). Faraday's Law

✓ Correct Answer: 2). Kirchhoff's Current Law

Explanation:

Node voltage method applies KCL at each node.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

163. Thevenin equivalent voltage equals

- 1). Short circuit voltage
- 2). Open circuit voltage
- 3). RMS voltage
- 4). Average voltage

✓ Correct Answer: 2). Open circuit voltage

Explanation:

Thevenin voltage is the voltage measured across output terminals with no load.

Ref: Network Analysis – M.E. Van Valkenburg

164. Norton equivalent current equals

- 1). Short circuit current
- 2). Open circuit current
- 3). Average current
- 4). RMS current

✓ Correct Answer: 1). Short circuit current

Explanation:

Norton current is the current flowing when output terminals are shorted.

Ref: Network Analysis – M.E. Van Valkenburg

165. Maximum power transfer occurs when

- 1). $R_L = 0$
- 2). $R_L = R_{th}$
- 3). $R_L = 2R_{th}$
- 4). $R_L = R_{th}/2$

✓ Correct Answer: 2). $R_L = R_{th}$

Explanation:

Load resistance must equal Thevenin resistance for maximum power transfer.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

166. Quality factor (Q) of resonant circuit represents

- 1). Voltage gain
- 2). Selectivity
- 3). Current gain
- 4). Power factor

✓ Correct Answer: 2). Selectivity

Explanation:

Higher Q gives sharper resonance.

Ref: Circuits and Networks – A. Sudhakar and Shyammmohan S. Palli

167. Bandwidth of resonant circuit equals

- 1). $f_r \times Q$
- 2). f_r / Q
- 3). Q / f_r
- 4). f_r^2 / Q

✓ Correct Answer: 2). f_r / Q

Explanation:

Bandwidth inversely proportional to Q-factor.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

168. Time constant of RC circuit equals

- 1). R/C
- 2). RC
- 3). $1/RC$
- 4). $\sqrt{RC}$

✓ Correct Answer: 2). RC

Explanation:

Product of resistance and capacitance.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

169. Time constant of RL circuit equals

- 1). R/L
- 2). L/R
- 3). LR
- 4). $\sqrt{LR}$

✓ Correct Answer: 2). L/R

Explanation:

Inductance divided by resistance.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

170. Characteristic impedance of transmission line equals

- 1). $\sqrt{L/C}$
- 2). $\sqrt{C/L}$
- 3). L/C
- 4). C/L

✓ Correct Answer: 1). $\sqrt{L/C}$

Explanation:

Depends on inductance and capacitance per unit length.

Ref: Networks, Lines and Fields – John D. Ryder

171. Standing Wave Ratio indicates

- 1). Signal voltage
- 2). Signal frequency
- 3). Impedance mismatch
- 4). Signal amplitude

☒ Correct Answer: 3). Impedance mismatch

Explanation:

SWR measures reflection on transmission line.

Ref: Networks, Lines and Fields – John D. Ryder

172. CRO is mainly used to

- 1). Measure voltage only
- 2). Display waveform
- 3). Measure resistance
- 4). Measure power

☒ Correct Answer: 2). Display waveform

Explanation:

Oscilloscope visually displays electrical signals.

Ref: Electronic Instrumentation – H.S. Kalsi

173. Horizontal deflection in CRO is produced by

- 1). Vertical amplifier
- 2). Time base generator
- 3). Trigger circuit
- 4). Power supply

☒ Correct Answer: 2). Time base generator

Explanation:

Time base moves electron beam horizontally.

Ref: Electronic Devices and Circuits – David A. Bell

174. Dual slope ADC works on

- 1). Integration principle
- 2). Binary search
- 3). Counting method
- 4). Parallel conversion

✓ Correct Answer: 1). Integration principle

Explanation:

Input voltage integrated and compared with reference.

Ref: Electronic Instrumentation – H.S. Kalsi

175. Successive approximation ADC uses

- 1). Binary search algorithm
- 2). Parallel conversion
- 3). Ramp method
- 4). Random conversion

✓ Correct Answer: 1). Binary search algorithm

Explanation:

Determines each bit sequentially.

Ref: Electronic Instrumentation – H.S. Kalsi

176. SCR belongs to

- 1). Transistor family
- 2). Thyristor family
- 3). Diode family
- 4). FET family

✓ Correct Answer: 2). Thyristor family

Explanation:

SCR is a PNPN device.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

177. TRIAC controls

- 1). DC power
- 2). AC power
- 3). RF signals
- 4). Optical signals

☒ Correct Answer: 2). AC power

Explanation:

TRIAC conducts in both directions.

Ref: Power Electronics – P.S. Bimbhra

178. IGBT combines features of

- 1). BJT and MOSFET
- 2). SCR and diode
- 3). FET and diode
- 4). BJT and SCR

☒ Correct Answer: 1). BJT and MOSFET

Explanation:

High input impedance and high current capability.

Ref: Power Electronics – Muhammad H. Rashid

179. LDR resistance

- 1). Increases with light
- 2). Decreases with light
- 3). Remains constant
- 4). Becomes infinite

☒ Correct Answer: 2). Decreases with light

Explanation:

Light generates carriers reducing resistance.

Ref: Electronic Devices and Circuit Theory – Boylestad

180. LVDT measures

- 1). Pressure
- 2). Temperature
- 3). Linear displacement
- 4). Voltage

✓ Correct Answer: 3). Linear displacement

Explanation:

Converts displacement to electrical signal.

Ref: A Course in Electrical and Electronic Measurements – A.K. Sawhney

181. Thermocouple works on

- 1). Seebeck effect
- 2). Hall effect
- 3). Photoelectric effect
- 4). Faraday effect

✓ Correct Answer: 1). Seebeck effect

Explanation:

Voltage generated due to temperature difference.

Ref: A Course in Electrical and Electronic Measurements – A.K. Sawhney

182. Ultrasonic waves have frequency

- 1). Below 20 Hz
- 2). Below 20 kHz
- 3). Above 20 kHz
- 4). Above 1 MHz

✓ Correct Answer: 3). Above 20 kHz

Explanation:

Above human hearing range.

Ref: Industrial Electronics – G.K. Mithal

183. Ultrasonic flaw detector detects

- 1). Voltage
- 2). Current
- 3). Internal cracks
- 4). Temperature

✓ Correct Answer: 3). Internal cracks

Explanation:

Used in non-destructive testing.

Ref: Industrial Electronics – G.K. Mithal

184. Induction heating uses

- 1). Direct current
- 2). Eddy currents
- 3). Electrostatic field
- 4). Capacitive current

✓ Correct Answer: 2). Eddy currents

Explanation:

AC magnetic field induces eddy currents.

Ref: Industrial Electronics – G.K. Mithal

185. Transfer function equals

- 1). Output/Input
- 2). Input/Output
- 3). Voltage/Current
- 4). Current/Voltage

✓ Correct Answer: 1). Output/Input

Explanation:

Expressed in Laplace domain.

Ref: Control Systems Engineering – I.J. Nagrath and M. Gopal

186. Closed loop system contains

- 1). Feedback
- 2). No feedback
- 3). Oscillator
- 4). Amplifier

✓ Correct Answer: 1). Feedback

Explanation:

Output fed back to input.

Ref: Control Systems – A. Anand Kumar

187. Open loop system has

- 1). Feedback
- 2). No feedback
- 3). Oscillator
- 4). Amplifier

✓ Correct Answer: 2). No feedback

Explanation:

Output does not affect input.

Ref: Control Systems – A. Anand Kumar

188. Shannon theorem gives

- 1). Channel capacity
- 2). Signal amplitude
- 3). Signal frequency
- 4). Signal voltage

✓ Correct Answer: 1). Channel capacity

Explanation:

Defines maximum theoretical data rate.

Ref: Data Communications and Networking – Behrouz A. Forouzan

189. OSI model has

- 1). 5 layers
- 2). 6 layers
- 3). 7 layers
- 4). 8 layers

✓ Correct Answer: 3). 7 layers

Explanation:

Seven-layer networking architecture.

Ref: Computer Networks – Andrew S. Tanenbaum

190. Physical layer deals with

- 1). Routing
- 2). Bit transmission
- 3). Encryption
- 4). Error detection

✓ Correct Answer: 2). Bit transmission

Explanation:

Transmits raw bits over medium.

Ref: Data Communications and Networking – Forouzan

191. Data link layer handles

- 1). Routing
- 2). Error detection
- 3). Signal generation
- 4). Compression

✓ Correct Answer: 2). Error detection

Explanation:

Ensures error-free frame transmission.

Ref: Computer Networks – Andrew S. Tanenbaum

192. Network layer performs

- 1). Routing
- 2). Encryption
- 3). Signal amplification
- 4). Compression

✓ Correct Answer: 1). Routing

Explanation:

Determines packet path.

Ref: Data Communications and Networking – Forouzan

193. Transport layer ensures

- 1). Reliable communication
- 2). Signal generation
- 3). Packet switching
- 4). Signal amplification

✓ Correct Answer: 1). Reliable communication

Explanation:

End-to-end data delivery.

Ref: Computer Networking – Kurose and Ross

194. Application layer provides

- 1). User services
- 2). Routing
- 3). Signal transmission
- 4). Error detection

✓ Correct Answer: 1). User services

Explanation:

Interface between user applications and network.

Ref: Data Communications and Networking – Forouzan

195. Bus topology uses

- 1). Single backbone cable
- 2). Hub
- 3). Ring cable
- 4). Mesh network

✓ Correct Answer: 1). Single backbone cable

Explanation:

All devices share a common cable.

Ref: Computer Networks – Andrew S. Tanenbaum

196. Star topology uses

- 1). Backbone cable
- 2). Hub
- 3). Ring cable
- 4). Mesh network

✓ Correct Answer: 2). Hub

Explanation:

All nodes connect to central hub.

Ref: Data Communications and Networking – Forouzan

197. Ring topology forms

- 1). Closed loop
- 2). Tree structure
- 3). Bus network
- 4). Mesh network

✓ Correct Answer: 1). Closed loop

Explanation:

Nodes connected in circular fashion.

Ref: Computer Networks – Andrew S. Tanenbaum

198. Packet switching transmits

- 1). Entire message
- 2). Packets
- 3). Analog signals
- 4). Frames only

✓ Correct Answer: 2). Packets

Explanation:

Data divided into packets.

Ref: Data Communications and Networking – Forouzan

199. Internet is example of

- 1). LAN
- 2). WAN
- 3). PAN
- 4). MAN

✓ Correct Answer: 2). WAN

Explanation:

Global wide area network.

Ref: Computer Networks – Andrew S. Tanenbaum

200. Networking mainly enables

- 1). Signal generation
- 2). Resource sharing
- 3). Power generation
- 4). Frequency control

✓ Correct Answer: 2). Resource sharing

Explanation:

Allows sharing of devices and information.

Ref: Data Communications and Networking – Behrouz A. Forouzan

APE CET – 2026
Electronics and Communication Engineering
Grand Test – 5

101. The barrier potential of a silicon diode at room temperature is approximately

- 1). 0.2 V
- 2). 0.3 V
- 3). 0.7 V
- 4). 1.2 V

☒ Correct Answer: 3). 0.7 V

Explanation:

Silicon PN junction requires about 0.7 V to overcome the barrier potential and conduct.

Ref: Electronic Devices and Circuit Theory – Robert L. Boylestad and Louis Nashelsky

102. The barrier potential of a germanium diode is approximately

- 1). 0.1 V
- 2). 0.3 V
- 3). 0.7 V
- 4). 1.1 V

☒ Correct Answer: 2). 0.3 V

Explanation:

Germanium diodes have lower barrier potential than silicon.

Ref: Electronic Devices and Circuits – David A. Bell

103. The varactor diode works in

- 1). Forward bias region
- 2). Reverse bias region
- 3). Breakdown region
- 4). Saturation region

☒ Correct Answer: 2). Reverse bias region

Explanation:

Varactor diode uses voltage dependent capacitance in reverse bias.

Ref: Electronic Devices and Circuits – David A. Bell

104. The transistor configuration having highest voltage gain is

- 1). CB
- 2). CE

3). CC

4). Common source

✓ Correct Answer: 2). CE

Explanation:

Common emitter configuration provides high voltage gain.

Ref: Electronic Principles – Albert Malvino and David A. Bates

105. A clipper circuit is mainly used for

1). Signal amplification

2). Waveform shaping

3). Power supply regulation

4). Signal detection

✓ Correct Answer: 2). Waveform shaping

Explanation:

Clippers remove portions of waveform above or below reference.

Ref: Electronic Devices and Circuit Theory – Boylestad

106. A clamper circuit is used to

1). Amplify signal

2). Shift DC level of waveform

3). Detect signal

4). Generate oscillation

✓ Correct Answer: 2). Shift DC level of waveform

Explanation:

Clamper shifts entire waveform upward or downward.

Ref: Electronic Devices and Circuits – David A. Bell

107. Efficiency of bridge rectifier is

1). 40.6%

2). 50%

3). 81.2%

4). 100%

✓ Correct Answer: 3). 81.2%

Explanation:

Bridge rectifier theoretical efficiency equals full wave rectifier.

Ref: Electronic Devices and Circuit Theory – Boylestad

108. A Zener diode is mainly used as

1). Amplifier

2). Oscillator

- 3). Voltage regulator
- 4). Detector

✓ Correct Answer: 3). Voltage regulator

Explanation:

Zener maintains constant output voltage.

Ref: Electronic Devices and Circuits – Millman and Halkias

109. In FET the drain current is controlled by

- 1). Gate voltage
- 2). Source current
- 3). Drain voltage
- 4). Base voltage

✓ Correct Answer: 1). Gate voltage

Explanation:

Gate voltage controls conduction channel.

Ref: Electronic Devices and Circuits – Millman and Halkias

110. Differential amplifier amplifies

- 1). Average of two signals
- 2). Difference between two signals
- 3). Sum of two signals
- 4). Square of signal

✓ Correct Answer: 2). Difference between two signals

Explanation:

Differential amplifier amplifies difference of inputs.

Ref: Microelectronic Circuits – Sedra and Smith

111. Operational amplifier open loop gain is

- 1). Very small
- 2). Moderate
- 3). Very high
- 4). Zero

✓ Correct Answer: 3). Very high

Explanation:

Ideal op-amp has extremely high open loop gain.

Ref: Op-Amps and Linear Integrated Circuits – Ramakant A. Gayakwad

112. Astable multivibrator has

- 1). One stable state
- 2). Two stable states

- 3). No stable state
- 4). Three stable states

✓ Correct Answer: 3). No stable state

Explanation:

Astable circuit oscillates continuously.

Ref: Pulse and Digital Circuits – A. Anand Kumar

113. Bistable multivibrator has

- 1). One stable state
- 2). Two stable states
- 3). No stable state
- 4). Infinite states

✓ Correct Answer: 2). Two stable states

Explanation:

Bistable circuit stores binary data.

Ref: Pulse and Digital Circuits – A. Anand Kumar

114. Schmitt trigger converts

- 1). Sinusoidal wave to square wave
- 2). Noisy signal to square wave
- 3). Square wave to triangular wave
- 4). Pulse to sine wave

✓ Correct Answer: 2). Noisy signal to square wave

Explanation:

Hysteresis removes noise.

Ref: Pulse, Digital and Switching Waveforms – Millman and Taub

115. Miller sweep circuit generates

- 1). Square wave
- 2). Linear ramp waveform
- 3). Sinusoidal waveform
- 4). Pulse waveform

✓ Correct Answer: 2). Linear ramp waveform

Explanation:

Used in time base generators.

Ref: Pulse, Digital and Switching Waveforms – Millman and Taub

116. AM modulation index greater than 1 causes

- 1). Perfect modulation
- 2). Over modulation

3). Under modulation

4). No modulation

✓ Correct Answer: 2). Over modulation

Explanation:

Distortion occurs when $m > 1$.

Ref: Electronic Communication Systems – George Kennedy

117. Bandwidth of AM signal equals

1). f_m

2). $2f_m$

3). f_c

4). $2f_c$

✓ Correct Answer: 2). $2f_m$

Explanation:

Upper and lower sidebands present.

Ref: Electronic Communication Systems – George Kennedy

118. FM modulation varies

1). Amplitude

2). Frequency

3). Phase

4). Power

✓ Correct Answer: 2). Frequency

Explanation:

Carrier frequency varies with modulating signal.

Ref: Communication Systems – Simon Haykin

119. Superheterodyne receiver uses

1). RF amplifier

2). Mixer

3). Local oscillator

4). All of the above

✓ Correct Answer: 4). All of the above

Explanation:

All stages required for frequency conversion.

Ref: Electronic Communication Systems – George Kennedy

120. PCM stands for

1). Pulse Carrier Modulation

2). Pulse Code Modulation

3). Phase Code Modulation

4). Pulse Current Modulation

✓ Correct Answer: 2). Pulse Code Modulation

Explanation:

Analog signals converted to digital form.

Ref: Digital Communications – Sanjay Sharma

Next I will continue **Grand Test – 5 (121–200)** including:

- **Digital electronics numericals**
- **Circuit theory calculations**
- **8051 instruction questions**
- **Networking protocol traps**
- **ECET-level tricky conceptual questions.**

continue

Continuing **Grand Test – 5 (AP ECET Real Exam Type)** with **Questions 121–160.**

AP ECET 2026 – ECE

GRAND TEST – 5

Questions 101–200 (Continued)

121. The decimal equivalent of binary number $(10110)_2$ is

1). 20

2). 21

3). 22

4). 23

✓ Correct Answer: 3). 22

Explanation:

$(10110)_2 = 1 \times 16 + 0 \times 8 + 1 \times 4 + 1 \times 2 + 0 \times 1 = 22.$

Ref: Digital Fundamentals – Thomas L. Floyd

122. The Boolean expression $A + 0$ simplifies to

1). 0

2). A

3). 1

4). A'

✓ Correct Answer: 2). A

Explanation:

Identity law of Boolean algebra.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

123. The Boolean expression $A \cdot 1$ simplifies to

- 1). 0
- 2). A
- 3). 1
- 4). A'

☒ Correct Answer: 2). A

Explanation:

Multiplicative identity property.

Ref: Digital Design – M. Morris Mano and Michael D. Ciletti

124. The output of NAND gate is

- 1). $A + B$
- 2). AB
- 3). $(AB)'$
- 4). $(A + B)'$

☒ Correct Answer: 3). $(AB)'$

Explanation:

NAND is the complement of AND gate.

Ref: Modern Digital Electronics – R.P. Jain

125. The output of NOR gate is

- 1). $A + B$
- 2). AB
- 3). $(A + B)'$
- 4). $(AB)'$

☒ Correct Answer: 3). $(A + B)'$

Explanation:

NOR gate gives complement of OR output.

Ref: Modern Digital Electronics – R.P. Jain

126. A half adder produces

- 1). Sum only
- 2). Carry only
- 3). Sum and carry
- 4). Difference and borrow

☒ Correct Answer: 3). Sum and carry

Explanation:

Half adder adds two bits.

Ref: Digital Design – M. Morris Mano

127. MOD-16 counter requires

- 1). 2 flip-flops
- 2). 3 flip-flops
- 3). 4 flip-flops
- 4). 5 flip-flops

✓ Correct Answer: 3). 4 flip-flops

Explanation:

$$2^4 = 16.$$

Ref: Modern Digital Electronics – R.P. Jain

128. A 4-variable K-map contains

- 1). 8 cells
- 2). 16 cells
- 3). 32 cells
- 4). 64 cells

✓ Correct Answer: 2). 16 cells

Explanation:

$$\text{Number of cells} = 2^4.$$

Ref: Fundamentals of Digital Circuits – A. Anand Kumar

129. SRAM stores data using

- 1). Capacitors
- 2). Flip-flops
- 3). Inductors
- 4). Resistors

✓ Correct Answer: 2). Flip-flops

Explanation:

Bistable latch circuits store data.

Ref: Digital Electronics – Anil K. Maini

130. DRAM stores data using

- 1). Capacitors
- 2). Flip-flops
- 3). Inductors
- 4). Resistors

✓ Correct Answer: 1). Capacitors

Explanation:

Charge stored in capacitors represents data.

Ref: Digital Electronics – Anil K. Maini

131. The accumulator register in 8051 is

- 1). A
- 2). B
- 3). PSW
- 4). SP

☒ Correct Answer: 1). A

Explanation:

Most arithmetic and logic operations occur in accumulator.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

132. The register used along with accumulator for multiplication is

- 1). R0
- 2). B
- 3). PSW
- 4). DPTR

☒ Correct Answer: 2). B

Explanation:

Instruction MUL AB uses A and B registers.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

133. Instruction MOV A,#55H uses

- 1). Immediate addressing
- 2). Register addressing
- 3). Direct addressing
- 4). Indirect addressing

☒ Correct Answer: 1). Immediate addressing

Explanation:

Constant value loaded into accumulator.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

134. The instruction DJNZ stands for

- 1). Decrement and Jump if Not Zero
- 2). Divide and Jump if Not Zero
- 3). Decrement and Jump if Zero
- 4). Divide and Jump if Zero

☒ Correct Answer: 1). Decrement and Jump if Not Zero

Explanation:

Common instruction for loop control.

Ref: The 8051 Microcontroller – Kenneth J. Ayala

135. Default stack pointer value in 8051 is

- 1). 00H
- 2). 07H
- 3). 10H
- 4). FFH

✓ Correct Answer: 2). 07H

Explanation:

Stack begins after register bank.

Ref: The 8051 Microcontroller and Embedded Systems – Mazidi

136. Bluetooth operates in

- 1). 900 MHz band
- 2). 2.4 GHz band
- 3). 5 GHz band
- 4). 10 GHz band

✓ Correct Answer: 2). 2.4 GHz band

Explanation:

Bluetooth uses ISM band.

Ref: Data Communications and Networking – Behrouz A. Forouzan

137. WLAN uses IEEE standard

- 1). 802.3
- 2). 802.5
- 3). 802.11
- 4). 802.15

✓ Correct Answer: 3). 802.11

Explanation:

Defines wireless LAN communication.

Ref: Computer Networking – Kurose and Ross

138. ARPANET was

- 1). First LAN
- 2). First Internet prototype
- 3). First router
- 4). First modem

✓ Correct Answer: 2). First Internet prototype

Explanation:

ARPANET evolved into modern Internet.

Ref: Computer Networks – Andrew S. Tanenbaum

139. TCP provides

- 1). Reliable communication
- 2). Unreliable communication
- 3). Broadcast communication
- 4). Multicast communication

✓ Correct Answer: 1). Reliable communication

Explanation:

TCP ensures reliable packet delivery.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

140. UDP provides

- 1). Reliable communication
- 2). Connection-oriented communication
- 3). Connectionless communication
- 4). Error correction

✓ Correct Answer: 3). Connectionless communication

Explanation:

UDP sends packets without establishing connection.

Ref: TCP/IP Protocol Suite – Behrouz A. Forouzan

141. Router forwards data based on

- 1). MAC address
- 2). IP address
- 3). Port number
- 4). Domain name

✓ Correct Answer: 2). IP address

Explanation:

Routers operate at network layer.

Ref: Computer Networks – Andrew S. Tanenbaum

142. Switch operates at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 2). Data link layer

Explanation:

Switch uses MAC address.

Ref: Data Communications and Networking – Forouzan

143. Hub works at

- 1). Physical layer
- 2). Data link layer
- 3). Network layer
- 4). Transport layer

✓ Correct Answer: 1). Physical layer

Explanation:

Hub repeats signals without processing.

Ref: Computer Networks – Andrew S. Tanenbaum

144. Frame relay uses

- 1). Circuit switching
- 2). Packet switching
- 3). Optical switching
- 4). Satellite switching

✓ Correct Answer: 2). Packet switching

Explanation:

Frame relay transmits packets efficiently.

Ref: Data Communications and Networking – Forouzan

145. ATM cell size equals

- 1). 48 bytes
- 2). 53 bytes
- 3). 64 bytes
- 4). 128 bytes

✓ Correct Answer: 2). 53 bytes

Explanation:

48 byte payload + 5 byte header.

Ref: Data and Computer Communications – William Stallings

146. DNS converts

- 1). Domain name to IP address
- 2). IP address to MAC address
- 3). Port number to protocol
- 4). Packet to frame

✓ Correct Answer: 1). Domain name to IP address

Explanation:

DNS resolves domain names.

Ref: Computer Networks – Andrew S. Tanenbaum

147. FTP uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 1). 21

Explanation:

FTP control port.

Ref: TCP/IP Protocol Suite – Forouzan

148. SMTP uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 2). 25

Explanation:

SMTP transfers outgoing mail.

Ref: TCP/IP Protocol Suite – Forouzan

149. POP3 uses port

- 1). 21
- 2). 25
- 3). 80
- 4). 110

☒ Correct Answer: 4). 110

Explanation:

POP3 retrieves emails.

Ref: Computer Networking – Kurose and Ross

150. HTTP protocol transfers

- 1). Email messages
- 2). Web pages
- 3). Files
- 4). DNS queries

☒ Correct Answer: 2). Web pages

Explanation:

HTTP transfers hypertext documents.

Ref: Computer Networks – Andrew S. Tanenbaum

161. In mesh current analysis the basic law applied is

- 1). Kirchhoff's Current Law
- 2). Kirchhoff's Voltage Law
- 3). Ohm's Law
- 4). Faraday's Law

✓ Correct Answer: 2). Kirchhoff's Voltage Law

Explanation:

Mesh analysis uses KVL around closed loops to determine mesh currents.

Ref: Engineering Circuit Analysis – William H. Hayt, Jack E. Kemmerly, Steven M. Durbin

162. In nodal analysis the governing law is

- 1). KVL
- 2). KCL
- 3). Ohm's law
- 4). Faraday's law

✓ Correct Answer: 2). KCL

Explanation:

Nodal analysis applies Kirchhoff's Current Law at nodes.

Ref: Fundamentals of Electric Circuits – Charles K. Alexander and Matthew N.O. Sadiku

163. Thevenin equivalent voltage is equal to

- 1). Short circuit voltage
- 2). Open circuit voltage
- 3). RMS voltage
- 4). Average voltage

✓ Correct Answer: 2). Open circuit voltage

Explanation:

Thevenin voltage equals the open-circuit terminal voltage.

Ref: Network Analysis – M.E. Van Valkenburg

164. Norton equivalent current equals

- 1). Open circuit current
- 2). Short circuit current
- 3). RMS current
- 4). Average current

✓ Correct Answer: 2). Short circuit current

Explanation:

Norton current is the current flowing when output terminals are shorted.

Ref: Network Analysis – M.E. Van Valkenburg

165. Maximum power transfer occurs when

- 1). $R_L = 0$
- 2). $R_L = R_{th}$
- 3). $R_L = 2R_{th}$
- 4). $R_L = R_{th}/2$

✓ Correct Answer: 2). $R_L = R_{th}$

Explanation:

Load resistance must equal Thevenin resistance.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

166. Q-factor of resonant circuit indicates

- 1). Voltage gain
- 2). Selectivity
- 3). Current gain
- 4). Power factor

✓ Correct Answer: 2). Selectivity

Explanation:

Higher Q means sharper resonance.

Ref: Circuits and Networks – A. Sudhakar and Shyammmohan S. Palli

167. Bandwidth of resonant circuit equals

- 1). $f_r \times Q$
- 2). f_r / Q
- 3). Q / f_r
- 4). f_r^2 / Q

✓ Correct Answer: 2). f_r / Q

Explanation:

Bandwidth inversely proportional to Q-factor.

Ref: Network Analysis and Synthesis – Franklin F. Kuo

168. Time constant of RC circuit equals

- 1). R/C
- 2). RC
- 3). $1/RC$
- 4). $\sqrt{RC}$

✓ Correct Answer: 2). RC

Explanation:

RC product determines charging and discharging rate.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

169. Time constant of RL circuit equals

- 1). R/L
- 2). L/R
- 3). LR
- 4). $\sqrt{LR}$

✓ Correct Answer: 2). L/R

Explanation:

RL time constant equals inductance divided by resistance.

Ref: Engineering Circuit Analysis – Hayt and Kemmerly

170. Characteristic impedance of transmission line is

- 1). $\sqrt{L/C}$
- 2). $\sqrt{C/L}$
- 3). L/C
- 4). C/L

✓ Correct Answer: 1). $\sqrt{L/C}$

Explanation:

Depends on inductance and capacitance per unit length.

Ref: Networks, Lines and Fields – John D. Ryder

171. Standing Wave Ratio indicates

- 1). Signal voltage
- 2). Signal frequency
- 3). Impedance mismatch
- 4). Signal amplitude

✓ Correct Answer: 3). Impedance mismatch

Explanation:

SWR measures reflection in transmission line.

Ref: Networks, Lines and Fields – John D. Ryder

172. CRO is mainly used for

- 1). Measuring resistance
- 2). Displaying waveform
- 3). Measuring power
- 4). Measuring inductance

✓ Correct Answer: 2). Displaying waveform

Explanation:

Oscilloscope displays voltage signals visually.

Ref: Electronic Instrumentation – H.S. Kalsi

173. Horizontal deflection in CRO is produced by

- 1). Vertical amplifier
- 2). Time base generator
- 3). Trigger circuit
- 4). Power supply

✓ Correct Answer: 2). Time base generator

Explanation:

Time base moves electron beam horizontally.

Ref: Electronic Devices and Circuits – David A. Bell

174. Dual slope ADC operates on

- 1). Binary search
- 2). Integration principle
- 3). Parallel comparison
- 4). Ramp method

✓ Correct Answer: 2). Integration principle

Explanation:

Integrates input voltage then reference voltage.

Ref: Electronic Instrumentation – H.S. Kalsi

175. Successive approximation ADC uses

- 1). Binary search algorithm
- 2). Parallel conversion
- 3). Ramp conversion
- 4). Random conversion

✓ Correct Answer: 1). Binary search algorithm

Explanation:

Determines each bit sequentially.

Ref: Electronic Instrumentation – H.S. Kalsi

176. SCR structure is

- 1). PN junction
- 2). PNP transistor
- 3). PNPN device
- 4). NPN transistor

✓ Correct Answer: 3). PNPN device

Explanation:

SCR consists of four semiconductor layers.

Ref: Power Electronics – M.D. Singh and K.B. Khanchandani

177. TRIAC controls

- 1). DC power
- 2). AC power
- 3). RF signals
- 4). Optical signals

✓ Correct Answer: 2). AC power

Explanation:

TRIAC conducts in both directions.

Ref: Power Electronics – P.S. Bimbhra

178. IGBT is mainly used for

- 1). Low power circuits
- 2). High power switching
- 3). Audio amplifiers
- 4). Rectifiers

✓ Correct Answer: 2). High power switching

Explanation:

IGBT used in power converters and motor drives.

Ref: Power Electronics – Muhammad H. Rashid

179. LDR resistance

- 1). Increases with light
- 2). Decreases with light
- 3). Remains constant
- 4). Becomes infinite

✓ Correct Answer: 2). Decreases with light

Explanation:

Light generates carriers reducing resistance.

Ref: Electronic Devices and Circuit Theory – Boylestad

180. LVDT measures

- 1). Pressure
- 2). Temperature
- 3). Linear displacement
- 4). Voltage

✓ Correct Answer: 3). Linear displacement

Explanation:

LVDT converts displacement to electrical signal.

Ref: A Course in Electrical and Electronic Measurements – A.K. Sawhney

181. Thermocouple works on

- 1). Seebeck effect
- 2). Hall effect
- 3). Photoelectric effect
- 4). Faraday effect

✓ Correct Answer: 1). Seebeck effect

Explanation:

Temperature difference generates voltage.

Ref: A Course in Electrical and Electronic Measurements – A.K. Sawhney

182. Ultrasonic waves have frequency

- 1). Below 20 Hz
- 2). Below 20 kHz
- 3). Above 20 kHz
- 4). Above 1 MHz

✓ Correct Answer: 3). Above 20 kHz

Explanation:

Above human audible range.

Ref: Industrial Electronics – G.K. Mithal

183. Ultrasonic flaw detector detects

- 1). Temperature
- 2). Internal cracks
- 3). Voltage
- 4). Current

✓ Correct Answer: 2). Internal cracks

Explanation:

Used in non-destructive testing.

Ref: Industrial Electronics – G.K. Mithal

184. Induction heating works on

- 1). Electrostatic field
- 2). Eddy currents
- 3). Direct current
- 4). Capacitive current

✓ Correct Answer: 2). Eddy currents

Explanation:

AC magnetic field induces eddy currents.

Ref: Industrial Electronics – G.K. Mithal

185. Transfer function equals

- 1). Output/Input
- 2). Input/Output
- 3). Voltage/Current
- 4). Current/Voltage

✓ Correct Answer: 1). Output/Input

Explanation:

Defined in Laplace domain.

Ref: Control Systems Engineering – I.J. Nagrath and M. Gopal

186. Closed loop system contains

- 1). Feedback
- 2). No feedback
- 3). Oscillator
- 4). Amplifier

✓ Correct Answer: 1). Feedback

Explanation:

Output fed back to input.

Ref: Control Systems – A. Anand Kumar

187. Open loop system has

- 1). Feedback
- 2). No feedback
- 3). Oscillator
- 4). Amplifier

✓ Correct Answer: 2). No feedback

Explanation:

Output independent of input.

Ref: Control Systems – A. Anand Kumar

188. Shannon theorem determines

- 1). Channel capacity
- 2). Signal amplitude
- 3). Signal frequency
- 4). Signal voltage

✓ Correct Answer: 1). Channel capacity

Explanation:

Defines maximum theoretical data rate.

Ref: Data Communications and Networking – Behrouz A. Forouzan

189. OSI model has

- 1). 5 layers
- 2). 6 layers
- 3). 7 layers
- 4). 8 layers

✓ Correct Answer: 3). 7 layers

Explanation:

Standard networking architecture.

Ref: Computer Networks – Andrew S. Tanenbaum

190. Physical layer deals with

- 1). Routing
- 2). Bit transmission
- 3). Encryption
- 4). Error detection

✓ Correct Answer: 2). Bit transmission

Explanation:

Handles raw bit transmission.

Ref: Data Communications and Networking – Forouzan

191. Data link layer performs

- 1). Routing
- 2). Error detection
- 3). Encryption
- 4). Compression

✓ Correct Answer: 2). Error detection

Explanation:

Ensures error-free frame transmission.

Ref: Computer Networks – Andrew S. Tanenbaum

192. Network layer performs

- 1). Routing
- 2). Encryption
- 3). Signal amplification
- 4). Compression

✓ Correct Answer: 1). Routing

Explanation:

Determines packet path.

Ref: Data Communications and Networking – Forouzan

193. Transport layer ensures

- 1). Reliable communication
- 2). Signal generation
- 3). Packet switching
- 4). Signal amplification

✓ Correct Answer: 1). Reliable communication

Explanation:

Provides end-to-end communication.

Ref: Computer Networking – Kurose and Ross

194. Application layer provides

- 1). User services
- 2). Routing
- 3). Signal transmission
- 4). Error detection

✓ Correct Answer: 1). User services

Explanation:

Interface between applications and network.

Ref: Data Communications and Networking – Forouzan

195. Bus topology uses

- 1). Single backbone cable
- 2). Hub
- 3). Ring cable
- 4). Mesh network

✓ Correct Answer: 1). Single backbone cable

Explanation:

All devices share common cable.

Ref: Computer Networks – Andrew S. Tanenbaum

196. Star topology uses

- 1). Backbone cable
- 2). Hub
- 3). Ring cable
- 4). Mesh network

✓ Correct Answer: 2). Hub

Explanation:

All nodes connect to central hub.

Ref: Data Communications and Networking – Forouzan

197. Ring topology forms

- 1). Closed loop
- 2). Tree structure
- 3). Bus network
- 4). Mesh network

✓ Correct Answer: 1). Closed loop

Explanation:

Nodes connected in circular structure.

Ref: Computer Networks – Andrew S. Tanenbaum

198. Packet switching transmits

- 1). Entire message
- 2). Packets
- 3). Analog signals
- 4). Frames only

✓ Correct Answer: 2). Packets

Explanation:

Data divided into packets.

Ref: Data Communications and Networking – Forouzan

199. Internet is example of

- 1). LAN
- 2). WAN
- 3). PAN
- 4). MAN

✓ Correct Answer: 2). WAN

Explanation:

Global wide area network.

Ref: Computer Networks – Andrew S. Tanenbaum

200. Networking mainly enables

- 1). Signal generation
- 2). Resource sharing
- 3). Power generation
- 4). Frequency control

✓ Correct Answer: 2). Resource sharing

Explanation:

Allows sharing of information and devices.

Ref: Data Communications and Networking – Behrouz A. Forouzan

END NOTE

Your Rank is Not Decided in the Exam Hall...

It Is Decided in Your Preparation Room.

Dear Student,

If you have reached this page, it means you have completed a serious journey.

You have revised formulas.

You have solved hundreds of objective questions.

You have faced mock tests under pressure.

You have corrected mistakes.

You have improved.

That is exactly how ranks are built.

Remember These Final Principles

- ✓ Concepts win over shortcuts.
- ✓ Accuracy is more powerful than speed.
- ✓ Revision is more important than new study.
- ✓ Formula clarity gives confidence.
- ✓ Mock test analysis gives rank.

AP ECET is not about difficult questions.

It is about **avoiding silly mistakes**.

Final Strategy Before Exam

- Revise all **9 Units formula sheets**.
- Focus on **frequently tested areas**:
 - Diode characteristics and rectifier formulas
 - Transistor configurations (CE, CB, CC)
 - Amplifier gains and feedback concepts
 - Oscillators and multivibrators
 - AM, FM modulation index and bandwidth
 - Radar, Antenna parameters and wave propagation
 - Digital electronics basics (Boolean algebra, counters, flip-flops)

- Circuit theory formulas (Thevenin, Norton, Resonance, Q-factor)
 - Microcontroller 8051 architecture and instructions
 - Networking basics (OSI model, protocols)
 - Sleep well before exam day.
 - Stay calm.
 - Read each question carefully.
-

In the Exam Hall

1. Attempt **easy questions first**.
 2. Avoid overthinking **simple theory questions**.
 3. Recheck **numerical formulas and units carefully**.
 4. Use **elimination method** wisely.
 5. Never leave **known questions unanswered**.
-

Your Future Starts After This Exam

This exam is not the destination.
It is the bridge.

After ECET:

- You enter **B.Tech (ECE)**.
- You build **electronics and communication skills**.
- You explore **embedded systems, VLSI, communication systems, and networking**.
- You prepare for **internships and placements**.
- You shape your **engineering career**.

Your rank is just the beginning.

Believe This

You are not competing with thousands.

You are competing with:

- Your preparation
- Your focus
- Your discipline

If you prepared sincerely,
your rank is already secured.

 **Study Smart. Stay Consistent. Aim High.**

All the Best for AP ECET 2026.

You are ready.

Book Description

AP ECET is a gateway for Diploma students to enter B.Tech through lateral entry. Success in this exam requires clarity, structured preparation, and focused practice.

This book is designed as a complete preparation system based on:

- Unit-wise weightage analysis
- Concept clarity in simple language
- Three-level practice questions (Basic to Rank Booster)
- Important formulas and comparison charts
- Frequently repeated questions
- Rapid revision sheets
- Smart exam attempt strategies

Why Choose This Book?

- ✓ Clear and concise theory
- ✓ Structured preparation plan
- ✓ Exam-oriented practice questions
- ✓ Concept + Numerical balance
- ✓ Rank-focused strategy

About the Author

Bandi Dayasagar is an academician, researcher, and career mentor with strong expertise in Mechanical Engineering and Computer Information Systems. With academic qualifications from Diploma to MS (USA) and practical exposure in leading national organizations, he founded Sagar Educational Society to guide Diploma and Engineering students toward structured, exam-focused preparation. His teaching philosophy is simple: Clear Concepts. Smart Preparation. Disciplined Execution.