

ADHIKAANSH ACADEMY (IITJEE NEET IX X XI XII)

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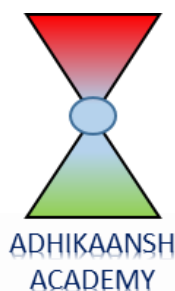
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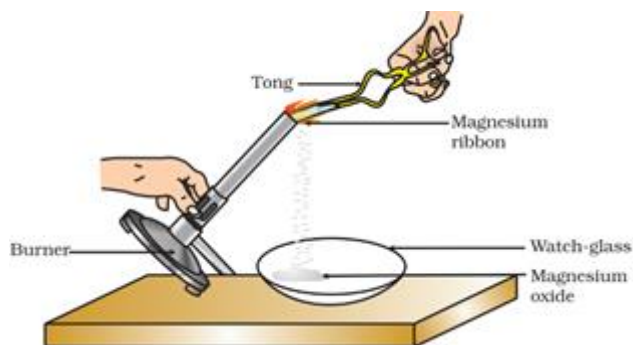
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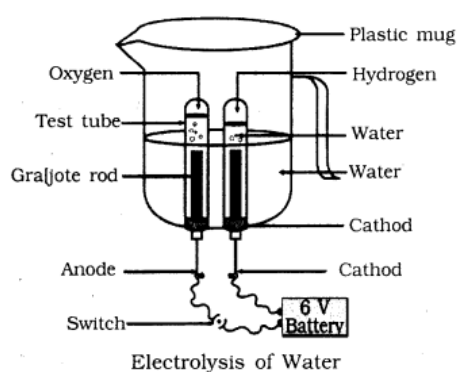
Name of the Chapter : Chemical Reactions and Equations

CASE BASED MCQs

- I. Clean a magnesium ribbon about 2 cm long by rubbing it with sandpaper. Hold it with a pair of tongs. Burn it using a spirit lamp or burner and collect the ash so formed in a watch-glass.



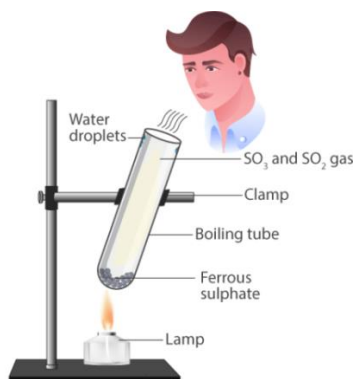
- Magnesium ribbon is rubbed before burning because it has a coating of
 - basic magnesium carbonate
 - basic magnesium oxide
 - basic magnesium sulphide
 - basic magnesium chloride
 - What is the colour of magnesium ribbon?
 - White
 - Black
 - Grey
 - Yellow
 - What is the chemical name of the powder obtained in the activity?
 - magnesium carbonate
 - magnesium oxide
 - magnesium sulphide
 - magnesium chloride
 - Which compound is formed when the powder obtained reacts with water?
 - Magnesium sulphate
 - Magnesium oxide
 - Magnesium carbonate
 - Magnesium hydroxide
- II. Take a plastic mug, drill two holes at its base and insert carbon electrodes. Connect these electrodes to a 6 volt battery. Fill the mug with water such that the electrodes are immersed. Add a few drops of dilute sulphuric acid to the water. Take two test tubes



filled with water and invert them over the two carbon electrodes. Switch on the current and leave the apparatus undisturbed for some time.

1. What is the ratio in which hydrogen and oxygen are present in water by volume?
 - A. 1:2
 - B. 1:1
 - C. 2:1
 - D. 1:8
2. Which electrodes are used in this activity?
 - A. Graphite
 - B. Diamond
 - C. Copper
 - D. Coke
3. Where is hydrogen gas collected?
 - A. Anode
 - B. Cathode
 - C. At both electrodes
 - D. Hydrogen gas is not evolved in this activity
4. Which of the following is an endothermic process?
 - A. Dilution of sulphuric acid
 - B. Condensation of water vapours
 - C. Respiration in human beings
 - D. Electrolysis

III. Take about 2 g ferrous sulphate crystals in a dry boiling tube. Heat the boiling tube over the flame of a burner or spirit lamp. In this reaction you can observe that a single reactant breaks down to give simpler products. This is a decomposition reaction. Ferrous sulphate crystals ($\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$) lose water when heated and the colour of the crystals changes. It then decomposes to ferric oxide (Fe_2O_3), sulphur dioxide (SO_2) and sulphur trioxide (SO_3). Ferric oxide is a solid, while SO_2 and SO_3 are gases.



1. What can we observe in this activity?

- A. Water vapor is evolved
- B. Change in colour
- C. Smell of burning sulphur
- D. All of the above.

2. What is the colour of iron oxide?

- A. Brown
- B. Grey
- C. Yellow
- D. White

3. What compound is formed when sulphur dioxide is passed through water?

- A. Sulphuric acid
- B. Sulphurous acid
- C. Hydrogen Sulphide
- D. Sulphur trioxide

IV: Read the following and answer the questions

The double displacement reaction is a type of chemical reaction, where two compounds react and the cation and anion of the two reactants swap places forming 2 new products. The ionic compounds considered as reactants are water soluble. One of the products is formed as a precipitate or as a gas which is water soluble.

1. The reaction between lead nitrate and potassium iodide is an example of.

- A) Combination reaction
- B) Decomposition Reaction
- C) Displacement reaction
- D) Double displacement reaction.

2. What was the color of the precipitate formed when Lead nitrate reacts with Potassium iodide ?

- A) Blue
- B) Red
- C) Yellow
- D) Orange

3. Which metallic spoon can be used to stir Lead nitrate solution ?

- A) Sodium
- B) Silver
- C) Iron
- D) Aluminum

V. We have observed that iron articles are shiny when new, but get coated with a reddish brown powder when left for some time. This process is commonly known as rusting of iron. Some other metals also get tarnished in this manner. Have you noticed the colour of the coating formed on copper and silver? When a metal is attacked by substances around it such as moisture, acids, etc., it is said to corrode and this process is called corrosion.

1. The chemical formula of rust is

- A) Fe_2O_3 B) Fe_3O_4 C) $\text{Fe}_2\text{O}_3 \cdot \text{XH}_2\text{O}$ D) $\text{Fe}_{30}4 \cdot \text{XH}_2\text{O}$

2. Which of the following metal is highly corrosive ?

- A) Zinc B) Aluminum C) Gold D) Silver

3. If a metal undergoes uniform corrosion it becomes

- A) Thicker B) Perforated C) Thinner D) None of the above

Name of the Chapter : ACIDS BASES AND SALTS

READ THE FOLLOWING PASSAGES AND ANSWER THE QUESTIONS-

I : There are many substances which are used to detect the solutions as acidic or basic. They are called Acid-Base indicators. Depending upon the property of the indicator, we have different groups of Acid-Base indicators. Some indicators show different colours in acidic or basic medium and some indicators give different odours in acidic and basic medium. These indicators are either extracted from the plants or synthesised in the laboratory or industry.

1) Which of the following will turn red litmus blue?

- A. Amla juice B. lemon juice C. Soft drink D. Baking soda

2) A solution turns blue litmus red, the pH of the solution is likely to be-

- A. 6 B. 7 C. 8 D. 9

3) Which one of the following can be used as an acid-base indicator by visually impaired student?

- A. Turmeric B. Hibiscus C. Vanilla D. Litmus

4) Select the incorrect option.

Indicator	Colour in acidic medium	Colour in basic medium
A. Litmus (Purple)	Red	Blue
B. Phenolphthalein (Colourless)	Pink	Colourless
C. Red cabbage extract (Purple)	Red	Green
D. Methyl orange (Orange)	Red	Yellow

II. Tajmahal, the seventh wonder of the world, is made of white stone. This white stone contains the same substance 'A' that is present in chalk powder and lime-stone. It is turning yellow due to polluted air. If it is cleaned by an acidic cleaner, a gas 'B' is released, which when passed through a solution 'C', forms the same substance which is present in the white stone that was used to make Tajmahal.



1) The substance A is-

- A. Ca_3CO_2 B. CaCO_3 C. $\text{Ca}(\text{OH})_2$ D. CaSO_4

2) Gas B is-

- A. Hydrogen B. Nitrogen C. Chlorine D. Carbon di oxide

3) Solution C is-

- A. CaCl_2 B. CaCO_3 C. $\text{Ca}(\text{OH})_2$ D. CaSO_4

4) What is the nature of the substance A?

- A. Acidic B. Basic C. Neutral D. None

III. A scale for measuring hydrogen ion concentration in a solution, called pH scale has been developed. The p in pH stands for 'potenz' in German, meaning power. On the pH scale we can measure pH from 0 to 14. pH should be thought of simply as a number which indicates the acidic or basic nature of a solution. Higher the hydronium ion concentration, lower is the pH value.

1. Which one of the following will have the highest hydrogen ion concentration?

A. pH = 1.1 B. pH = 2.2 C. pH = 3.3 D. pH = 4.4

2. How is the hydrogen ion concentration and pH related to each other?

A. They are inversely proportional.

B. They are directly proportional.

C. They are equal.

D. They have no relation.

Ans. A. They are inversely proportional.

3. A basic solution could have a pH of-

A. 3 B. 5 C. 7 D. 9

4. The table provides the pH of four solutions P, Q, R and S.

Solution	pH value
P	2
Q	9
R	5
S	11

Which of the following correctly represents the solutions in increasing order of their hydronium ion concentration?

A. $P > Q > R > S$

B. $P > S > Q > R$

C. $S < Q < R < P$

D. $S < P < Q < R$

IV. Bleaching powder is a pale yellowish powder. It is soluble in water but due to the presence of impurities, we never observe a clear solution. Its chemical formula is $\text{Ca}(\text{OCl}_2)$ with its chemical name as Calcium hypochlorite. Bleaching powder is also called calcium chlorohypochlorite because it is considered as a mixed salt of hydrochloric acid and hypochlorous acid.

1. The compound lime water that is used in the manufacture of bleaching powder is

A. Clear solution of $\text{Ca}(\text{OH})_2$.

B. Milky Suspension of $\text{Ca}(\text{OH})_2$.

C. Clear solution of CaCl_2 .

D. Clear solution of CaCO_3 .

2. One of the products obtained during the electrolysis of aqueous Sodium Chloride (brine) used in the preparation of Bleaching powder is.

A. Sodium metal at cathode

B. Hydrogen gas

C. Chlorine gas

D. Slaked lime.

3. One of the following cannot be considered as the use of bleaching powder

A. It is an oxidising agent.

B. it is used for disinfecting water.

C. it bleaches cotton and linen in the textile industry.

D. it releases Oxygen gas on heating which can be used for aeration of water bodies.

V. Water of crystallisation is the fixed number of water molecules present in one formula unit of a salt. water(s) of crystallization or water(s) of hydration are water molecules that are present inside crystals. Water is often incorporated in the formation of crystals from aqueous solutions. A salt with associated water of crystallization is known as a hydrate.

1. Which of the following salt does not contain water of crystallisation?

A. Blue Vitriol

B. Baking Soda

C. Washing Soda

D. Gypsum.

2. The temperature at which Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) into Plaster of Paris ($\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$)

A. 373 K

B. 273 K

C. 374 K

D. 375 K

3. The formula of Plaster of Paris is $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$, it is to be noted that half water molecule is shown to be attached as water of crystallisation. This indicates that

A. Only half water molecule is present in Calcium Sulphate crystal

B. Two formula units of Calcium Sulphate share one molecule of water.

C. Two formula units of calcium Sulphate share two molecules of water

D. Two formula units of Calcium Sulphate share one and a half molecules of water.

Name of the Chapter : METALS AND NON-METALS

I. On the basis of reactivity of different metals with oxygen, water and acids as well as displacement reactions, the metals have been arranged in the decreasing order of their reactivities. This arrangement is known as activity series or reactivity series of metals. The basis of reactivity is the tendency of metals to lose electrons. If a metal can lose electrons easily to form positive ions, it will react readily with other substances. Therefore, it will be a reactive metal. On the other hand, if a metal loses electrons less rapidly to form a positive ion, it will react slowly with other substances. Therefore, such a metal will be less reactive.

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1. Which of the following metal is less reactive than hydrogen?

A. Copper

B. Zinc

C. Magnesium

D. Lead

2. Which of the following represents the correct order of reactivity for the given metals?

A. $\text{Na} > \text{Mg} > \text{Al} > \text{Cu}$

B. $\text{Mg} > \text{Na} > \text{Al} > \text{Cu}$

C. $\text{Na} > \text{Mg} > \text{Cu} > \text{Al}$

D. $\text{Mg} > \text{Al} > \text{Na} > \text{Cu}$

3. Hydrogen gas is not evolved when a metal reacts with nitric acid. It is because HNO_3 is a strong oxidising agent. It oxidises the H, produced to water and itself gets reduced to any of the nitrogen oxides (N_2O , NO , NO_2). But _____ and _____ react with very dilute HNO_3 to evolve H_2 gas.

A. Pb, Cu

B. Na, K

C. Mg, Mn

D. Al, Zn

4. Which of the following metals reacts vigorously with oxygen?

A. Zinc

B. Magnesium

C. Sodium

D. Copper

II. Ionic compound is a chemical compound in which ions are held together by ionic bonds.

An ionic bond is the type of chemical bond in which two oppositely charged ions are held through electrostatic forces. We know that, metal atoms have loosely bound valence electrons in their valence shell and non-metal atoms need electrons in their valence shell to attain noble gas configuration. The metal atom loses the valence electrons while non-metal atom accepts these electrons. By losing electrons, metal atoms change to cations and by accepting electrons, non-metals form anions. Ionic compounds are generally solid and exist in the form of crystal. They have high melting and boiling points.

1. Which of the following can change to a cation?

A. Fluorine

B. Oxygen

C. Potassium

D. Neon

2. Which of the following can change to an anion?

- A. Iodine B. Magnesium C. Calcium D. Xenon

3. Ionic compounds are soluble in _____.

- A. Kerosene B. Petrol C. Water D. None of these

4. Which of the following statements is correct about ionic compounds?

- I. They conduct electricity in solid state.
II. They conduct electricity in solutions.
III. They conduct electricity in molten state.

- A. I only B. II only C. III only D. II and III only

5. Select the incorrect statement.

- A. Ionic compounds are generally brittle
B. Ions are the fundamental units of ionic compounds
C. Formation of ionic bonds involve sharing of electrons
D. NaCl is an ionic compound.

III. The arrangement of metals in a vertical column in the decreasing order of their reactivities is called the reactivity series or activity series of metals. The most reactive metal is at the top position of the reactivity series. The least reactive metal is at the bottom of the reactivity series. Hydrogen, though a non-metal, has been included in the activity series of metals only for comparison. Apart from it, the hydrogen atom also has tendency to lose its valence electron and form cation which behaves like metal $H \rightarrow H^+ + e^-$

1. Which metal can be displaced by copper from its salt solution?

- A. Zinc B. Silver C. Iron D. Lead

2. An element 'X' after reacting with acids liberates hydrogen gas and can displace lead and mercury from their salt solutions. The metal 'X' is

- A. copper B. gold C. calcium D. hydrogen.

3. The most reactive metal is

- A. potassium B. barium C. zinc D. calcium

4. The metal which does not liberate hydrogen gas after reacting with acid is

- A. zinc B. lead C. iron D. gold

5. Which of the following metals does not react with water at all?

(I) Sodium

(II) Copper

(III) Aluminium

(IV) Gold

A. I and III only B. IV only C. II and IV only D. I, II, III and IV

IV. Metals as we know, are very useful in all fields, industries in particular. Non-metals are no less in any way. Oxygen present in air is essential for breathing as well as for combustion. Non-metals form a large number of compounds which are extremely useful, e.g., ammonia, nitric acid, sulphuric acid, etc.

Non-metals are found to exist in three states of matter. Only solid non-metals are expected to be hard however, they have low density and are brittle. They usually have low melting and boiling points and are poor conductors of electricity.

1. _____ is a non-metal but is lustrous

A. Phosphorus B. Sulphur C. Bromine D. Iodine

2. Which of the following is known as 'King of chemicals'?

A. Urea B. Ammonia X C. Sulphuric acid D. Nitric acid

3. Which of the following non-metals is a liquid?

A. Carbon B. Bromine C. Iodine D. Sulphur

4. Hydrogen is used

A. for the synthesis of ammonia B. for the synthesis of methyl alcohol
C. nitrogenous fertilizers D. all of these

5. Generally, non-metals are bad conductors of electricity but 'X' which is a form of carbon is a good conductor of electricity and is an exceptional non-metal. 'X' is

A. diamond B. graphite C. coal D. coke.

V. When a silvery grey powder of a solid (A) is mixed with a powder of solid (B) no reaction occurs. But if the mixture is ignited and lighted using magnesium ribbon a reaction occurs with evolution of large amount of heat forming product (C) which settles down as liquid metal and the solid product(D) formed floats on the liquid (C). (C) in solid form reacts with moisture to form rust. The amount of heat generated during the reaction is so high that the reaction is used in welding of electric conductors, joints in railway tracks. Based on this information, answer the following questions.

1. Identify A and C?

- A. A- Al and C- Fe
- B. A-Fe and C—Al
- C. A-Mg and C -Al
- D. A-Al and C -Cu

2, Identify B and D which are oxides of

- A. B- Fe , D- Al
- B. B- Mg, D-Al
- C. B- Al , D- Cu
- D. B-Al , D -Fe

3. Amphoteric oxides are

- A. metal oxides which do not react with acids but react with bases
- B. metal oxides which reacts with both acids as well as bases
- C. metal oxides which reacts with acids but do not react with bases
- D metal oxides which shows no reaction with either acids or bases

4. Which of the following is amphoteric in nature?

- A. both aluminium oxide and zinc oxide
- B. Only Zinc oxide
- C. Only Aluminium oxide
- D. Neither of them

Name of the Chapter : LIFE PROCESSES

I. There is a range of strategies by which the food is taken in and used by the organisms in heterotrophic nutrition. Some organisms breakdown the food material outside the body and then absorb it. Others take in whole material and break it down inside their bodies. What can be taken in and broken down depends on the body design and functioning. Some others derive nutrition from plants and animals without killing them.

1. Organisms which derive nutrition from plants and animals without killing them.

- A. Parasites
- B. Saprophytes
- C. Heterotrophs
- D. Autotrophs

2. In which part of amoeba complex food particles are broken down into simpler ones.

- A. Cytoplasm
- B. Pseudopodia
- C. Nucleus
- D. Food vacuole

3. Which of the following is an example of saprotroph.

- A. Cuscuta
- B. Sugarcane
- C. Bread mould
- D. Amoeba

4. Taking in whole material and breaking it down inside the body is

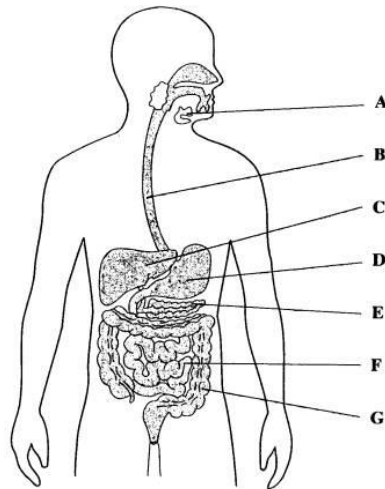
- A. Parasitic nutrition
- B. Holozoic nutrition
- C. Saprophytic nutrition
- D. Symbiosis

5. Heterotrophic nutrition involves

- A. Production of simple sugar from inorganic compounds
- B. Utilisation of chemical energy to prepare food
- C. Utilisation of energy obtained by plants

D. All of these

II.



1. Which of these correctly represent the labels B C D and E

A. Pancreas , Oesophagus , Stomach , Liver

B. Oesophagus , Liver , Stomach , Pancreas

C. Stomach , Liver , Oesophagus , Pancreas

D. Oesophagus , Pancreas , Liver , Stomach

2. Villi are present in

A. D

B. E

C. F

D. A

3. The enzyme that is released by label A

A. Trypsin

B. Amino acids

C. Amylase

D. Intestinal juices

4. The movements that occur along part B to push the food forward.

- A. Rotation
- B. Peristalsis
- C. Flexion
- D. Protrusion

5. In case of diarrhoea, which major process does not take place normally in region G?

- A. Absorption of food
- B. Absorption of water
- C. Secretion of hormones
- D. Removal of waste material

III.

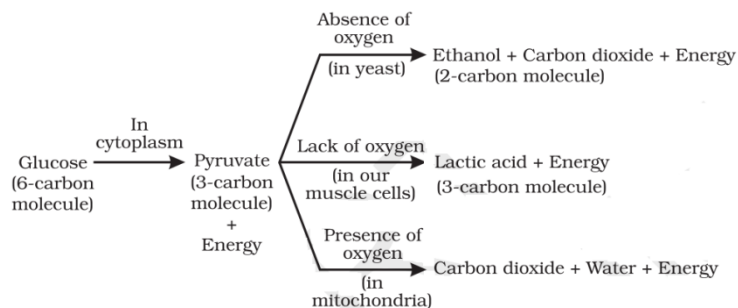


Fig: Break-down of glucose by various pathways

1. The pathway of respiration common in all living organisms is X ; it occurs in the Y and the products formed are two molecules of Z . Identify X Y Z and select the correct answer.

- | X | Y | Z |
|----------------------|--------------|--------------|
| A. Glycolysis | Mitochondria | Pyruvic acid |
| B. Glycolysis | Cytoplasm | Pyruvic acid |
| C. Citric acid cycle | Cytoplasm | Phosphate |
| D. Krebs's cycle | Mitochondria | Acetyl CoA |

2. During vigorous physical exercise, lactic acid is formed from glucose inside the muscle cells because

- A. there is lack of oxygen
- B. there is lack of water
- C. there is excess of carbon dioxide
- D. none of the above

3. Type of respiration seen during fermentation

- A. Aerobic
- B. Anaerobic
- C. Reduction
- D. Oxidation

4. End product of Aerobic respiration

- A. NADH
- B. Oxygen
- C. ATP
- D. $\text{CO}_2 + \text{ATP} + \text{H}_2\text{O}$

5. Amount of energy released is more during

- A. Anaerobic respiration
- B. Fermentation
- C. Aerobic respiration
- D. Reduction

IV. Blood transport food, Oxygen and waste materials in our bodies. It consists of plasma as a fluid medium. A pumping organ [heart] is required to push the blood around the body. The blood flows through the chambers of heart in a specific manner and direction. While flowing throughout the body, blood exerts a pressure against the wall of a vessel.

1.Oxygenated blood from lungs enters left atrium through

- A. vena cava B. pulmonary artery C. pulmonary vein D. Aorta

2.The rate of blood flow in the capillaries is very low because capillaries are

- A. very narrow and have high resistance
B. Much wide and have low resistance
C. Very narrow and have low resistance
D. Much wide and have high resistance

3.Which of the following statements are true about human heart ?

- A.It is a hollow muscular organ
B. It is four chambered having three auricles and one ventricle.
C. It has different chambers to prevent Oxygen rich blood from mixing with the blood containing Carbondioxide
D. BOTH A & C

4. Study the table below and select the row that has correct information .

BODY FLUID	CONTENTS
A. Blood	plasma + RBC+ WBC+platelets
B. Plasma	Blood -- RBC
C. Lymph	Plasma +RBC
D. Serum	Plasma + RBC +WBC

V. Our body needs to remove the wastes that build up from cell activities and from digestion . If these wastes are not removed , then our cells can stop working and we can get very sick.The organs of excretory system consists of a pair of kidneys, a pair of ureters , a urinary bladder and a urethra.Each kidney is made up of nearly one million complex tubular structures called nephrons. The formation of urine involves various processes that takes place in the different parts of the nephrons. Each nephron consists of a cup- shaped upper end called Bowman’s capsule containing a bunch of capillaries called glomerulus. Bowman’s

capsule leads to tubular structure, proximal convoluted tubule, loop of Henle and distal convoluted tubule which ultimately joins the collecting tubule.

1. The following substances are the excretory products in animals. Choose the least toxic form.

- A. Urea
- B. Uric acid
- C. Ammonia
- D. Carbon dioxide

2. Glomerular filtrate is first collected by

- A. Distal convoluted tubule
- B. proximal convoluted tubule
- C. Bowman's capsule
- D. loop of Henle

3. The outline of principal events of urination is given below in random order.

I) stretch receptors on the wall of urinary bladder send signals to the CNS.

II) The bladder fills with urine and becomes distended.

III) Micturition

IV) CNS passes on motor messages to initiate the contraction of smooth muscles of bladder and simultaneous relaxation of urethral sphincter. The correct sequence of the events is

- A. I → II → III → IV
- B. IV → III → II → I
- C. II → I → IV → III
- D. III → II → I → IV

4. Urine formation occurs through

- A. Ultrafiltration, reabsorption, secretion and osmosis.
- B. secretion, osmosis, ultrafiltration and reabsorption.

C. only filtration and absorption .

D. only osmosis and secretion.

Name of the Chapter : LIGHT REFLECTION & REFRECTION

I. An image formed in a convex mirror is always virtual, erect and smaller in size whatever be the position of the object. However in a concave mirror the image may be real or virtual: erect or inverted : smaller or bigger in size than the object. This would depend upon the distance of the object from the mirror.

1. A Concave mirror is used as reflector in
 - A. Torches
 - B. Search lights
 - C. Head lights of motor vehicles
 - D. All the above
2. In street lamps, the reflector used is a
 - A. Convex mirror
 - B. Concave mirror
 - C. Plane mirror
 - D. None of these
3. Which of the mirrors has larger field of view ?
 - A. Convex
 - B. Concave
 - C. plane
 - D. all have same field of view
4. Real or virtual image of an object formed by a concave mirror depends on
 - A. Size of mirror
 - B. Polish of mirror
 - C. Distance of object from the mirror
 - D. All of these

II. The image of an object formed by a convex lens may be real/virtual: erect/inverted; smaller/larger than the object. It would depend upon distance of the object from the lens. however, the image of an object formed by a concave lens is always virtual, erect and smaller in size than the object.

1. Question: to obtain image of an object on a screen jwe require a
 - A. Convex lens
 - B. Concave lens

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- C. Concave lens of large focal length
 - D. Concave lens of small focal length
2. Where an object should be placed in front of a concave lens to obtain a virtual image of the object?
 - A. Infinity
 - B. Principal focus
 - C. Very close to the lens
 - D. Any distance from the lens
 3. Where should an object be placed in front of a convex lens to obtain image of the size of the object ?
 - A. At focus F
 - B. At 2 F
 - C. Beyond 2 F
 - D. None of these
 4. To obtain an image smaller than the size of the object, we may use a
 - A. Convex lens only
 - B. Concave lens only
 - C. Either a convex lens or a concave lens
 - D. Cannot say

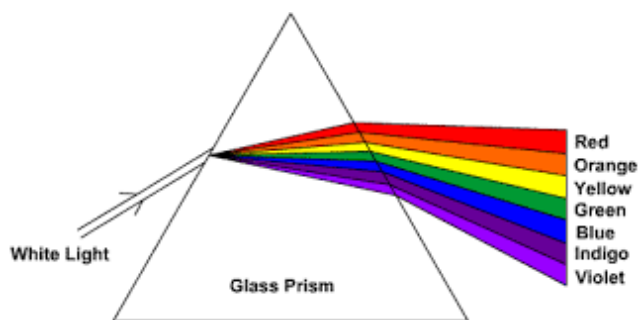
III. The scattering involves bouncing off of light by atoms/molecules of the medium through which they are travelling. Most of the beautiful phenomena like blue colour of sky, white colour of clouds, red hues of sunrise and sunset have been explained in terms of scattering of light. Lord Rayleigh studied elastic scattering and established that intensity of scattered light (I_s) varies inversely as the fourth power of wavelength (λ) of incident light. The only condition for Rayleigh scattering to be valid is that size of scatterer (x) must be much less than the wavelength (λ) of light.

1. Rayleigh scattering accounts for
 - A. Blue colour of sky
 - B. White colour of clouds
 - C. Red hues of sunrise and sunset
 - D. All the above
2. The essential condition for Rayleigh's scattering is the size (x) of scatterer must be
 - A. Much smaller wave length (λ) of light
 - B. Much greater than the wave length of light
 - C. Equal to wave length of light
 - D. Cannot say

3. In Rayleigh scattering intensity of scattered light (I_s) varies inversely as power (n) of wave length (λ) of light, where $n =$
 - A. 6
 - B. 8
 - C. 4
 - D. 2
4. Rayleigh scattering accounts for
 - A. Blue colour of sky
 - B. White colour of clouds
 - C. Red hues of sun rise and sun set
 - D. All the above

Name of the Chapter : THE HUMAN EYE AND COLOURFUL WORLD

I. The phenomenon of splitting of white light into its seven constituent colors when it passes through a glass prism is called dispersion of white light. The various colors seen are Violet, Indigo, Blue, Green, Yellow, Orange and Red. The sequence of colors remembers as VIBGYOR. The band of seven colors is called the spectrum.



1. **What happens when white light is passed from air to glass prism ?**
 - A. Reflects back
 - B. Bends away from normal
 - C. Un deviated
 - D. Bends towards normal
2. **Which Color deviates most in the formation of spectrum of white light by a prism ?**
 - A. VIOLET
 - B. ORANGE
 - C. GREEN
 - D. RED

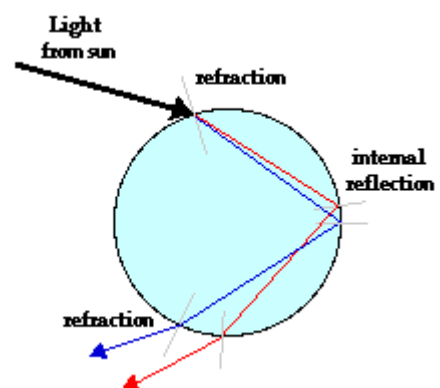
3. The angle between incident ray and emergent ray of a prism is called .

- A. Angle of Refraction
- B. Angle of deviation
- C. Angle of incidence
- D. Angle of emergence

II. A collection of suspended water droplets in the atmosphere serves as a refractor of light. The water represents a medium with a different optical density than the surrounding air. Light waves refract when they cross over the boundary from one medium to another. The decrease in speed upon entry of light into a water droplet causes a bending of the path of light towards the normal. And upon exiting the droplet, light speeds up and bends away from the normal. The droplet causes a deviation in the path of light as it enters and exits the drop.

There are countless paths by which light rays from the sun can pass through a drop. Each path is characterized by this bending towards and away from the normal.

One path of great significance in the discussion of rainbows is the path in which light refracts into the droplet, internally reflects, and then refracts out of the droplet. The diagram at the right depicts such a path. A light ray from the sun enters the droplet with a slight downward trajectory.



Upon refracting twice and reflecting once, the light ray is dispersed and bent downward towards an observer on earth's surface. Other entry locations into the droplet may result in similar paths or even in light continuing through the droplet and out the opposite side without significant internal reflection. But for the entry location shown in the diagram at the right, there is an optimal concentration of light exiting the airborne droplet at an angle towards the ground. As in the case of the refraction of light through prisms with nonparallel sides, the refraction of light at two boundaries of the droplet results in the dispersion of light into a spectrum of colors. The shorter wavelength blue and violet light refract a slightly greater amount than the longer wavelength red light. Since the boundaries are not parallel to each other, the double refraction results in a distinct separation of the sunlight into its component colors.

1. The speed of light from sun when enters the water droplet undergoes this phenomenon

- A. its speed decreases
- B. Light gets absorbed in the droplet

C. it becomes monochromatic D. Passes through undeviated

2. The rainbow formation could be because of the following reasons

A. light being reflected when entering a droplet of water, then refracted inside on the back of the droplet and refracted again when leaving it.

B. light being refracted when entering a droplet of water, then reflected inside on the back of the droplet and refracted again when leaving it.

C. . Due to interference of different wavelengths in white light

D. All scenarios possible.

3. When compared to air, medium of water droplet is

A. Optically rarer B. Has same optical density C. Optically insignificant when compared to air D. Optically denser.

4. Rainbow can also be observed on a sunny day when an observer looks at the sky through a waterfall or a sprinkler source or through a water fountain with the following condition.

A. Sun between the observer and the water source.

B. Sun behind the observer.

C. Sun behind the water source with observer in the opposite direction.

D. Position of sun does not affect the formation of rainbow.

III. Atmospheric refraction is the phenomenon of bending of light on passing through earth's atmosphere. As we move above the surface of earth, density of air goes on decreasing. Local conditions like temperature etc. also affect the optical density of earth's atmosphere. On account of atmospheric refraction, stars seen appear higher than they actual are; advanced sunrise; delayed sunset, oval appearance of the sun at sunrise and sunset; stars twinkle, planets do not.

1. Due to atmospheric refraction, apparent length of the day

A. increases

B. decreases

C. remains the same

D. all of these

2. Apparent position of the star appears raised due to
- A. atmospheric refraction
 - B. scattering of light
 - C. both (a) and (b)
 - D. none of these
3. The sun appears oval shaped or flattened due to
- A. dispersion
 - B. scattering
 - C. atmospheric refraction
 - D. cannot say
4. Twinkling of stars and non-twinkling of planets is accounted for by
- A. scattering of light
 - B. dispersion of light
 - C. atmospheric refraction
 - D. none of these
5. In absence of atmosphere, the colour of sky appears
- A. blue
 - B. black
 - C. red
 - D. yellow

IV. The spreading of light by the air molecules is called scattering of light. The light having least wavelength scatters more. The sun appears red at sunrise and sun set, appearance of blue sky it is due to the scattering of light. The colour of the scattered light depends on the size of particles. The smaller the molecules in the atmosphere scatter smaller wavelengths of light. The amount of scattering of light depends on the wavelength of light. When light from the sun enters the earth's atmosphere, it gets scattered by the dust particles and air molecules present in the atmosphere. The path of sunlight entering in the dark room through a fine hole is seen because of scattering of the sunlight by the dust particles present in its path inside the room.

1. To an astronaut in a spaceship , the colour of earth appears

- A. red
- B. blue
- C. white
- D. black

2. At the time of sunrise and sunset , the light from sun has to travel

- A. longest distance of atmosphere
- B. shortest distance of atmosphere
- C. both (A) and (B)
- D. can't say.

3. The colour of sky appears blue, it is due to the

- A. refraction of light through the atmosphere
- B. dispersion of light by air molecules
- C. scattering of light by fine dust particles
- D. all of these

V. The spreading of light by the air molecules is called scattering of light. The light having least wavelength scatters more. The sun appears red at sunrise and sunset, appearance of blue sky it is due to the scattering of light. The colour of the scattered light depends on the size of particles. The smaller the molecules in the atmosphere scatter smaller wavelengths of light. The amount of scattering of light depends on the wavelength of light. When light from sun enters the earth's atmosphere, it gets scattered by the dust particles and air molecules present in the atmosphere. The path of sunlight entering in the dark room through a fine hole is seen because of scattering of the sun light by the dust particles present in its path inside the room.

1. To an astronaut in a spaceship, the colour of earth appears

- A. Red
- B. Blue
- C. White
- D. Black

2. At the time of sunsise and sunset light has to travel
 - A. Longest distance of atmosphere
 - B. Shortest distance of atmosphere
 - C. Both A and B
 - D. Cannot say
3. The colour of sky appears blue, it is due to the
 - A. Refraction of light through the atmosphere
 - B. Scattering of light by air molecules
 - C. Dispersion of light by air molecules
 - D. All the above
4. At the time of sunrise and sunset
 - A. Blue colour scattered and red colour reaches our eye
 - B. Red colour scattered and blue colour reaches our eye
 - C. Green and blue scattered and orange reaches our eye
 - D. None of these

ANSWER KEY :

Name of the Chapter : Chemical Reactions and Equations

I 1.A 2.C 3.B 4.D

II. 1.C 2. A 3.B 4.D

III.1.D 2.A 3.C

IV1.D 2.C 3.B

V 1.C 2.B 3.C

Name of the Chapter : ACIDS, BASES AND SALTS

I 1.D 2.A 3.C 4.B

II. 1.B 2. D 3.C 4.B

III.1.A 2.A 3.D 4.C

IV1.A 2.C 3.D

V 1.B 2.A 3.B

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Name of the Chapter : METAL AND NON-METALS

I 1.A 2.A 3.C 4.C

II. 1. C 2. A 3.C 4.D 5.C

III.1.B 2.C 3. A 4.D. 5.C

IV1. D 2. C 3.B 4.D 5 B

V 1.A 2.A 3.B 4. A

Name of the Chapter : LIFE PROCESS

I 1.A 2.D 3.A 4.B 5. C

II. 1.B 2.C 3.C 4.B 5.B

III. 1.B 2.A 3.B 4.D 5. C

IV 1.C 2.A 3.D 4. A

V 1.B 2.C 3. C 4. A

Name of the Chapter : LIGHT REFLECTION AND REFRACTION

I 1.D 2.A 3.A 4.C

II. 1.A 2.D 3.B 4.C

III.1.C 2.D 3.C 4.B.

IV 1.A 2.C 3.A 4.C

V 1.A 2.D 3.D 4 A

Name of the Chapter : THE HUMAN EYE AND COLOURFUL WORLD

I 1.D 2.A 3.B

II.1.A 2. B 3.D 4.B

III.1.A 2.A 3.C 4.C 5.B

IV.1.D 2. A 3.C

V 1.B 2.A 3.B 4 B

Following questions consists of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- A. Both assertion and reason are true, and reason is the correct explanation of assertion.
- B. Both assertion and reason are true, but reason is not the correct explanation of assertion.
- C. Assertion is true but reason is false.
- D. Assertion is false and reason is true.

1)	<p>Assertion(A): After white washing the walls, a shiny white finish on walls is obtained after three or four days.</p> <p>Reason(R): Calcium hydroxide reacts with Carbon dioxide to form Calcium Carbonate which gives shiny white finish.</p>	1
2)	<p>Assertion(A): The number of atoms of each element remains the same, before and after a chemical reaction.</p> <p>Reason(R): Any chemical equation can be unbalanced because the mass may not be same on both sides of the equation.</p>	1
3)	<p>Assertion(A): Decomposition of Calcium Carbonate is a type of chemical reaction.</p> <p>Reason(R): Chemical reactions involve the breaking and making of bonds to produce new substances.</p>	1
4)	<p>Assertion(A): The colour of salts does not depend on water of crystallisation.</p> <p>Reason(R): Ferrous Sulphate crystals are blue in colour because of the seven water molecules of crystallisation.</p>	1

5)	<p>Assertion(A): Brown fumes are obtained from the thermal decomposition of Lead Nitrate.</p> <p>Reason(R): Nitrogen dioxide gas is released which is brown in colour.</p>	1
6)	<p>Assertion(A): Acidification of water decreases its conductivity during electrolysis.</p> <p>Reason(R): H^+ ions are released which hinder the flow of charges.</p>	1
7)	<p>Assertion(A): Silver Chloride turns grey in sunlight.</p> <p>Reason(R): This is an example of thermal decomposition</p>	1
8)	<p>Assertion(A): Reaction between Barium Hydroxide and Ammonium Chloride makes the test tube cool to touch.</p> <p>Reason(R): It is an example of endothermic reaction.</p>	1
9)	<p>Assertion(A): Silver Bromide is used in black and white photography.</p> <p>Reason(R): Silver Bromide decomposes in the presence of sunlight.</p>	1
10)	<p>Assertion(A): In double displacement reactions, no precipitate is formed.</p> <p>Reason(R): Barium Sulphate is precipitated during the double displacement reaction between Sodium Sulphate and Barium Chloride.</p>	1
11)	<p>Assertion(A): The surface of copper powder becomes black on heating.</p> <p>Reason: Black colour copper oxide is formed.</p>	1
12)	<p>Assertion(A): Addition of oxygen is oxidation.</p> <p>Reason(R): Removal of oxygen is reduction.</p>	1

13)	<p>Assertion(A): Oxidation and reduction take place simultaneously in a reaction.</p> <p>Reason(R): All chemical reactions are redox reactions.</p>	1
14)	<p>Assertion(A): Fatty foods taste the same even after long periods of exposure to air.</p> <p>Reason(R): We should store oily foods in air tight containers.</p>	1
15)	<p>Assertion(A): The glucose combines with oxygen in the cells of our body and provides energy.</p> <p>Reason(R): Respiration is an example of oxidation reaction.</p>	1
16)	<p>Assertion(A): Sulphur dioxide and Sulphur trioxides are released during the decomposition of iron sulphate.</p> <p>Reason(R): This is an example of thermal decomposition.</p>	1
17)	<p>Assertion(A): Iron nails turn blue colour copper sulphate solution to green colour.</p> <p>Reason(R): Copper is more reactive than iron.</p>	1
<p><u>ANSWERS:CHEMICAL REACTIONS AND EQUATIONS</u></p> <p>1. A 2.C 3.A. 4.D 5.A 6.D 7.C 8.A 9.B 10.D 11.A 12.B 13.C 14.D 15.B 16.B 17 C</p>		

Name of the Chapter: ACIDS, BASES AND SALTS

Following questions consists of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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- B. Both assertion and reason are true, but reason is not the correct explanation of assertion.
- C. Assertion is true but reason is false.
- D. Assertion is false and reason is true.

1)	Assertion (A): The HCl gas shows acidic behaviour in the water. Reason(R): The pH of dry HCl gas is 1.5.	1
2)	Assertion (A): The acid must always be added to water with constant stirring. Reason(R): Mixing of an acid with water decreases the conc. of H ⁺ ions per unit volume.	1
3)	Assertion (A): The organic compounds such as C ₆ H ₁₂ O ₆ and C ₂ H ₅ OH contain hydrogen but they do not conduct electricity in the water. Reason(R): Acids produce H ₃ O ⁺ ions in the solutions.	1
4)	Assertion (A): Phenolphthalein is a synthetic acid-base indicator. Reason(R): Phenolphthalein does not give any colour with acids but gives pink colour with bases.	1
5)	Assertion (A): When dil. H ₂ SO ₄ is added to zinc granules, a physical change is observed. Reason(R): A gas is evolved which burns with 'pop' sound.	1

6)	<p>Assertion(A): NH_4Cl is an acidic salt.</p> <p>Reason(R): NH_4Cl is the salt of hydrochloric acid and ammonium hydroxide.</p>	1
7)	<p>Assertion (A): $\text{pH} = 7$ indicates pure water.</p> <p>Reason(R): At the $\text{pH} 7$, $[\text{H}^+] = [\text{OH}^-] = 10^{-7}$</p>	1
8)	<p>Assertion (A): Honey bee-sting injects an acid in the skin which causes pain and irritation.</p> <p>Reason (R): Use of mild base like baking soda on the stung area gives relief.</p>	1
9)	<p>Assertion(A): $\text{NaHCO}_3 + \text{HCl} = \text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$</p> <p>Reason (R): Evolved gas catches fire immediately.</p>	1
10)	<p>Assertion: NaOH reacts with zinc metal and produces hydrogen gas.</p> <p>Reason: Acids react with active metals to produce hydrogen gas.</p>	1
11)	<p>Assertion(A): Baking powder is used in making cake instead of using only baking soda.</p> <p>Reason(R) : Baking powder contains Tartaric acid which reacts with sodium carbonate and removes bitter taste.</p>	1
12)	<p>Assertion(A): Plaster of Paris is stored in moisture proof containers.</p> <p>Reason(R) : Plaster of Paris sets into a hard mass on coming in contact with water to form anhydrous Calcium Sulphate.</p>	1
13)	<p>Assertion(A): The chemical formula of bleaching powder is CaOCl_2.</p> <p>Reason(R): Chlorine gas is passed over Calcium Oxide to form bleaching powder.</p>	1
14)	<p>Assertion(A): Soda-acid fire extinguisher contains sodium hydrogen carbonate and sulphuric acid.</p> <p>Reason(R): Sulphuric acid mixes with sodium hydrogen carbonate solution and produces a lot of CO_2 gas, which forms a blanket over fire and cuts it off from the supply of the air to the burning substance and the fire stops.</p>	1

15)	<p>Assertion(R): The compound prepared from gypsum on heating it at 373 K , is known as Plaster of Paris.</p> <p>Reason(R): Plaster of Paris is used in hospitals mainly as plaster for supporting fractured bones in the right position. In dentistry, it is used for making casts.</p>	1
16)	<p>Assertion(A): Washing soda is a chemical compound that can be used to remove stubborn stains from laundry</p> <p>Reason(R): The sodium carbonate in washing soda "softens" water.</p>	1
17)	<p>Assertion(A): Bleaching powder is CaOCl_2, and is prepared from chlorine and slaked lime</p> <p>Reason(R): Bleaching powder can be used for bleaching, disinfecting, oxidation.</p>	1
<p><u>ANSWERS:ACIDS,BASES AND SALTS</u></p> <p>1.C 2.B 3.B. 4.A 5.D 6.A 7.D 8.B 9.C 10.B 11.C 12.C 13.A 14.A 15.B 16.B 17 C</p>		

Name of the Chapter : METALS AND NON-METALS

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- C. Assertion is true but reason is false.
- D. Assertion is false and reason is true.

1)	<p>Assertion (A): Hydrogen gas is not evolved when a metal reacts with nitric acid.</p> <p>Reason (R): Nitric acid is a strong oxidising agent.</p>	1
2)	<p>Assertion(A): Zinc oxide is amphoteric in nature.</p> <p>Reason (R): Zinc oxide reacts with both acids and bases.</p>	1

3)	<p>Assertion(A): Magnesium chloride is an ionic compound.</p> <p>Reason (R): Metals and non-metals react by mutual transfer of electrons.</p>	1
4)	<p>Assertion(A): $MgCl_2$ is a covalent compound.</p> <p>Reason (R): $MgCl_2$ is a good conductor of electricity in molten state.</p>	1
5)	<p>Assertion: The reaction of calcium with water is less violent in comparison to that of sodium.</p> <p>Reason: The heat evolved is not sufficient for the hydrogen to catch fire.</p>	1
6)	<p>Assertion: C and N do not react with dil. HCl and dil. H_2SO_4.</p> <p>Reason: Metals do not react with dil. HCl and dil. H_2SO_4.</p>	1
7)	<p>Assertion: Copper displaces silver from silver nitrate solution.</p> <p>Reason: Copper is more reactive than silver.</p>	1
8)	<p>Assertion: Aluminium oxide and zinc oxide are acidic in nature.</p> <p>Reason: Amphoteric nature means that substance have both acidic and basic character.</p>	1
9)	<p>Assertion: Different metals have different reactivities with water and dilute acids.</p> <p>Reason: Reactivity of a metal depends on its position in the reactivity series.</p>	1
10)	<p>Assertion: Iron is the most widely used metal. But it is never used in its pure state.</p> <p>Reason: Pure iron is very soft and stretches easily when hot.</p>	1
11)	<p>Assertion: Gold occurs in native state.</p> <p>Reason: Gold is a reactive metal.</p>	1
12)	<p>Assertion: The property of beating a metal into sheets is called ductility.</p> <p>Reason: Gold and silver are most malleable metals.</p>	1

13)	Assertion: Silver and gold do not react with oxygen even at high temperatures. Reason: Silver and gold are less active metals.	1
14)	Assertion: The oxides of sulphur and phosphorus are acidic in nature. Reason: Metal oxides are basic in nature.	1
15)	Assertion: MgO exists in liquid state. Reason: The electrostatic forces of attraction between Mg^{2+} and O^{2-} ions constitute ionic bond.	1
16)	Assertion: On reacting with water, calcium starts floating over water. Reason: Calcium reacts with cold water at room temperature.	1
17)	Assertion: Electrovalency of Na is +1. Reason: The number of electrons which an atom either loses or gains in the formation of an ionic bond is known as its valency.	1
<p><u>ANSWERS: METALS AND NON-METALS</u></p> <p>1.A 2. A 3. A. 4.D 5.B 6.C 7.A 8.C 9.B 10.A 11.C 12.D 13.A 14.B 15.D 16.B 17 B</p>		

Name of the Chapter : LIFE PROCESSES

Following questions consists of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- A. Both assertion and reason are true, and reason is the correct explanation of assertion.
- B. Both assertion and reason are true, but reason is not the correct explanation of assertion.
- C. Assertion is true but reason is false.
- D. Assertion is false and reason is true.

1)	<p>Assertion : kidneys perform a dual function in our body.</p> <p>Reason: selective reabsorption occurs in the glomerulus.</p>	1
2)	<p>Assertion : mammals and birds have four chambered heart .</p> <p>Reason : mammals and birds are warm blooded.</p>	1
3)	<p>Assertion : a mammal has double circulation .</p> <p>Reason : higher energy need due to endothermy.</p>	1
4)	<p>Assertion: veins have valves.</p> <p>Reason : the pressure for the flow is far lesser compared to arteries.</p>	1
5)	<p>Assertion : kidneys purify blood.</p> <p>Reason : renal vein has more Oxygen than renal artery.</p>	1
6)	<p>Assertion : arteries always carry oxygenated blood.</p> <p>Reason: arteries transport blood from the heart to different parts of the body.</p>	1
7)	<p>Assertion : the left atrium and left ventricle are completely separated from the right atrium and the right ventricle.</p> <p>Reason : oxygenated and deoxygenated blood never mix with each other inside the heart</p>	1
8)	<p>Assertion: In plants gaseous exchange takes place by the opening and closing of guard cells.</p> <p>Reason :The exchange of gases occurs across the surface of stem , roots and leaves.</p>	1
9)	<p>Assertion: The Alveoli provide a surface where exchange of gases takes place.</p> <p>Reason :The Alveolar blood vessels transport oxygenated blood to all the cells of the body.</p>	1

10)	Assertion: Tracheal cartilage is present in the throat. Reason: The larynx plays an important role in human speech.	1
11)	Assertion: Bread tastes sweet on mastication. Reason : Salivary amylase converts starch into sugar.	1
12)	Assertion: At high altitudes the pressure of oxygen falls, inside lungs. Reason: Oxygen is absorbed very quickly from alveoli to increase breathing	1
13)	Assertion : Anaerobic respiration requires more energy as compared to aerobic respiration. Reason : Mitochondria is the power house of the cell	1
14)	Assertion : Chyme is the food which enters into the intestine from stomach. Reason : Chyme is acidic in nature.	1
15)	Assertion : During transpiration the evaporating water carries away heat energy. Reason : Due to water loss the osmotic pressure inside leaves increases.	1
16)	Assertion: Herbivores have longer intestine to allow the cellulose to get digested. Reason : Carnivores have shorter intestine to allow meat to get digested.	1
17)	Assertion: Lypase helps in the digestion of proteins. Reason : Digestion of proteins in small intestine needs basic medium	1
<u>ANSWERS: LIFE PROCESSES</u>		
1. C 2. A 3. A. 4.A 5.C 6. A 7. A 8.B 9.A 10.B 11.A 12.A 13.D 14.A 15.C 16.B 17. D		

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Name of the Chapter: LIGHT REFLECTION AND REFRACTION

Following questions consists of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- A. Both assertion and reason are true, and reason is the correct explanation of assertion.
- B. Both assertion and reason are true, but reason is not the correct explanation of assertion.
- C. Assertion is true but reason is false.
- D. Assertion is false and reason is true.

1)	Assertion(A) : Concave mirrors are used as make-up mirrors. Reason (R) : When the face is held within the focus of a concave mirror, then a diminished image of the face is seen in the concave mirror.	1
2)	Assertion(A) : The formula connecting u , v and f for a spherical mirror is valid in all situations for all spherical mirrors for all positions of the object. Reason (R) : Laws of reflection are strictly valid for plane surfaces.	1
3)	Assertion(A) : The mirrors used in search lights are concave spherical. Reason (R) : In concave spherical mirror the image formed is always virtual.	1
4)	Assertion(A) : For observing traffic at back, the driver mirror is convex mirror. Reason (R) : A convex mirror has much larger field of view than a plane mirror.	1
5)	Assertion(A) : When the object moves with a velocity 2 m/s, its image in the plane mirror moves with a velocity of 4 m/s. Reason (R) : The image formed by a plane mirror is as far behind the mirror as the object is in front of it.	1
6)	Assertion(A) : Virtual images are always erect. Reason (R) : Virtual images are formed by converging lenses only.	1
7)	Assertion (A) : The angle of incidence for a ray of light having zero angle of reflection is two. Reason (R) : Refracting surfaces follow Snell's Law.	1

8)	<p>Assertion (A): A Concave mirror of radius R is placed in water .Its focal length differs in Air and Water.</p> <p>Reason (R): Focal length of concave mirror is equal to R/2.</p>	1
9)	<p>Assertion (A): Higher the Refractive index of the medium lesser will be the speed of light in that Medium.</p> <p>Reason (R): Refractive index is inversely proportional to the speed of light.</p>	1
10)	<p>Assertion (A): Convex mirror is preferred for rear view mirrors in vehicles.</p> <p>Reason (R) :The field view of a convex mirror is lesser than that of concave mirror</p>	1
11)	<p>Assertion (A): Mirror Formula cannot be used for Plane Mirrors</p> <p>Reason (R): Plane Mirror is a Spherical Mirror of Infinite Focal Length.</p>	1
12)	<p>Assertion (A) : It is impossible to see virtual image with our naked Eye</p> <p>Reason (R) : The rays do not actually emanate from a virtual image</p>	1
13)	<p>Assertion (A): Light changes its speed when it passes from one medium to another.</p> <p>Reason (R): When a ray travels from vacuum to a medium, then refractive index is known as absolute refractive index.</p>	1
14)	<p>Assertion (A): Large Concave mirrors are used to concentrate sunlight to produce heat in solar cookers.</p> <p>Reason (R): Concave mirror converges the light rays falling on it to a point.</p>	1
15)	<p>Assertion(A): Light travels faster in water than air</p> <p>Reason (R): Water is denser than Air.</p>	1

16)	<p>Assertion (A): The emergent ray is parallel to the direction of incident ray.</p> <p>Reason (R): The extent of bending of the ray of light at the opposite parallel faces (air- glass interface and glass- air interface) of the rectangular glass slab is equal and opposite.</p>	1
17)	<p>Assertion (A): Refractive index of glass with respect to air is different for red light and violet light.</p> <p>Reason (R): Refractive Index of a pair of medium does not depend on the wavelength of the light used.</p>	1
<p><u>ANSWERS: LIGHT:REFLECTION AND REFRACTION</u></p> <p>1. A 2. C 3. C. 4.A 5.A 6.C 7.B 8.D 9.A 10.C 11.D 12.D 13.B 14.A 15.D 16.A 17 C</p>		

Name of the Chapter : HUMAN EYE AND COLOURFUL WORLD

Following questions consists of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- A. Both assertion and reason are true, and reason is the correct explanation of assertion.
- B. Both assertion and reason are true, but reason is not the correct explanation of assertion.
- C. Assertion is true but reason is false.
- D. Assertion is false and reason is true.

1)	<p>Assertion(A): A prism can split the incident white light into bands of different colours.</p> <p>Reason(R): The different colours of light bend through different angles with respect to the incident rays.</p>	1
2)	<p>Assertion(A): The angle of incidence and the angle of emergence are equal.</p> <p>Reason(R): The angle of refraction and the angle of deviation are not equal.</p>	1

3)	<p>Assertion(A): The red light bends the least while the violet bends the most.</p> <p>Reason(R): Red light has short wavelength whereas violet has long wavelength.</p>	1
4)	<p>Assertion(A): Rainbow is formed in the sky due to the dispersion of sunlight by water droplets.</p> <p>Reason(R): Light of shorter wavelength is scattered much more than the light of longer wavelength.</p>	1
5)	<p>Assertion(A): In case of rainbow, light at the inner surface of the water drop gets internally reflected.</p> <p>Reason(R): The angle between the refracted ray and normal to the drop surface is greater than the critical angle.</p>	
6)	<p>Assertion(A): The light of violet colour deviates the most and the light of red colour the least, while passing through a prism.</p> <p>Reason(R): For a prism material, refractive index is highest for red light and lowest for the violet light.</p>	1
7)	<p>Assertion(A): The stars twinkle, while the planets do not.</p> <p>Reason (R): The stars are much bigger in size than the planets.</p>	1
8)	<p>Assertion(A): The Sun appears flattened at sunrise and sunset.</p> <p>Reason (R): The apparent flattening of the Sun's disc at sunrise and sunset is due to atmospheric refraction.</p>	1
9)	<p>Assertion (A): The twinkling of stars is due to the fact that refractive index of the earth's atmosphere fluctuates.</p> <p>Reason (R): In cold countries, the phenomenon of looming (i.e ship appears in the sky) takes place, because refractive index of air decreases with height</p>	1
10)	<p>Assertion: The colour of the scattered light does not depend on the size of the scattering particles.</p> <p>Reason: Red light is used as a danger signal because it can travel longer distances through rain and fog.</p>	1

11)	Assertion: The sky appears dark in outer space.. Reason : Scattering does not occur in outer space as there is no atmosphere	1
12)	Assertion: The path of light is visible due to scattering of light. Reason : Tiny water droplets in the mist scatter light.	1
13)	Assertion (A) : At Mid-day sun appears to be bright white . Reason (R) : Scattering occurs due to size of dust particles and Air molecules.	1
14)	Assertion(A) : Just before sunset ,the sun appears to be elliptical. this may happen due to refraction Reason (R) : Refraction of light rays through atmosphere may cause different magnification in mutually perpendicular directions.	1
15)	Assertion(A): Sun looks reddish at sunrise and sunset. Reason (R) : Sun rays have to pass through smaller distance in atmosphere.	1
16)	Assertion: Rainbow is an example of the dispersion of sunlight by the water droplets. Reason: Light of shorter wavelength is scattered much more than light of larger wavelength.	1
17)	Assertion: Red light travels faster in glass than green light. Reason: The refractive index of glass is less for green light.	1
<u>ANSWERS: HUMAN EYE AND COLOURFUL WORLD</u>		
1.A 2.B 3. C 4.B 5.A 6.B 7.B 8.A 9.B 10.C 11.A 12.B 13.A 14.A 15.C 16.B 17. C		

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