

2025 -26 II PU PREPARATORY EXAMINATION

SUBJECT: BIOLOGY (36)

MAXIMUM MARKS: 70

TIME: 03 HOURS

NUMBER OF QUESTIONS: 44

General Instruction:

- This Question paper consists of four parts A, B, C, D and E
- Part – A consists of I and II and Part D consists of V and VI
- All the parts are compulsory
- For PART-A questions, only the first written answers will be considered for evaluation.
- Part – E consists of questions for visually challenged students only

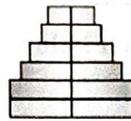
PART – A**I. Select the correct alternative from the choices given below:****15 x 1 = 15**

1. The non-albuminous seed is produced in
a) Maize b) Castor c) Wheat d) Pea
2. The uterine wall that undergoes cyclical changes during menstrual cycle is
a) Perimetrium b) Myometrium c) Endometrium d) Fundus
3. Which of the following cannot be detected in a developing foetus by amniocentesis.
a) Down's syndrome b) Hemophilia c) Sex of the foetus d) Hepatitis
4. The trait selected by Morgan to conduct dihybrid cross in *Drosophila* are located on.
a) X – chromosome of males and females b) X – chromosome of only female
c) Y – chromosome d) Both X and Y chromosome
5. Which of the following is the correct sequential steps in Hershey-Chase experiment?
a) Centrifugation ----- Blending ----- Infection
b) Infection ----- Centrifugation ----- Blending
c) Blending ----- Centrifugation ----- Infection
d) Infection ----- Blending ----- Centrifugation
6. Which of the following theories attempts to explain origin of universe.
a) Panspermia b) Big bang c) Chemical evolution d) Biogenetic
7. Heroin formed by acetylation of morphine is commonly called as.
a) Coke b) Crack c) Smack d) Charas
8. Human immune deficiency virus replicates in
a) NK cells b) Macrophage c) B cells d) PMNL
9. The sediments of flocs in the settling tank are called
a) Grit b) Sludge c) Activated sludge d) Activated grit

10. Statement I: Vector DNA and source DNA should be cut by different restriction enzymes to create recombinant vector.
Statement II: Vector DNA and source DNA should be cut by same enzyme to create recombinant vector.
- Both statements I and statement II are correct
 - Both statement I and statement II are incorrect
 - Statement I is correct, but statement II is incorrect
 - Statement I is incorrect, but statement II is correct

11. Genetically identical plants produced by micropropagation are called:
- Clones
 - Callus
 - Somaclones
 - Explants

12. The shape of the age pyramid reflects the population growth status. In this context, the given age pyramid indicates that the population is:



- Stable
 - Declining
 - Expanding
 - cannot be depicted
13. Each trophic level has certain mass of living material at a particular time is
- Standing state
 - Standing crop
 - Standing rate
 - Standing level
14. The most species rich taxonomic group among vertebrates is
- Fishes
 - Amphibians
 - Aves
 - Reptiles
15. The term biodiversity was popularized by
- Robert may
 - Edward Wilson
 - Paul Ehrlich
 - David Tilman

II. Fill in the blanks by choosing the appropriate word/Words from those given below: 5 x 1 = 5

(Convergent, Malignant, Stem, Divergent, Elution, Oscillatoria)

- The ----- cells of the inner mass of embryo have the potency to give rise to all the tissues and organs.
- Adaptive radiation of marsupials of Australia indicate ----- evolution.
- The most feared property of malignant tumour is -----
- The ----- is an autotrophic cyanobacterium that enriches the nitrogen content of the soil.
- The extraction of DNA bands from agarose gel in electrophoresis is known as -----

PART - B

III. Answer any FIVE of the following questions in 3 – 5 sentences wherever applicable: 5 x 2 = 10

- Define polyembryony. Given an example of a plant which exhibits polyembryony.
- Describe two natural methods of contraception in humans.
- Differentiate between pleiotropy and polygenic inheritance.
- There are two additional complexities in eukaryotic transcription. Comment.

25. What are analogous organs? Give an example.
 26. Draw a diagram of biogas plant and label two parts.
 27. "Alien species invasion leads to extinction of indigenous species". Justify the statement by giving two appropriate examples.

PART - C

IV. Answer any FIVE of the following questions in 40 – 80 words each wherever applicable: 5 x 3 = 15

28. Draw a labeled diagram of t. s. of an anther and label three parts.
 29. Describe the hormonal regulation of oogenesis.
 30. Explain the steps involved in in-vitro fertilization popularly known as "Test tube baby".
 31. Arrange the following ancestral forms of man in the order of their evolution.
 a) Australopithecus b) Homo erectus c) Neanderthal man d) Dryopithecus
 e) Homo habilis f) Ramapithecus
 32. Name the causative organism of the following diseases.
 a) Common cold b) Amoebiasis c) Ringworm
 33. Mention the uses of the following bioactive molecules.
 a) Streptokinase b) Cyclosporin-A c) Statins
 34. Draw a labeled diagram of pyramid of energy.

PART - D

V. Answer any FOUR of the following questions in about 200 – 250 words each wherever applicable:

4 x 5 = 20

35. Draw a diagram of human sperm and label five parts.
 36. Represent schematically the results of monohybrid cross in pea plant.
 37. The process of DNA replication is fast, accurate, energetically expensive, substrate and enzyme dependent, initiated from specific site and cannot uncoil on its entire length. Explain the process of DNA replication considering all these features.
 38. Explain the regulation of lac operon in *Escherichia coli*.
 39. What is innate immunity? Explain the four types of barriers of innate immunity with suitable examples.
 40. What is RNA interference? How does RNA interference help to develop resistance in tobacco plants against Nematode infection.
 41. Fill out the tabular column with the appropriate terms in relation to biological interactions among species.

Species A	Species B	Name of the interaction
Phytophagous insects		Predation
<i>Balanus</i>	<i>Chathamalus</i>	
Marine fish	Copepods	
	Orchid	Commensalism
Fig		Mutualism

VI. Answer any ONE of the following questions in about 200–250 words each wherever applicable:

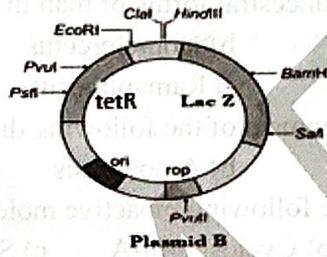
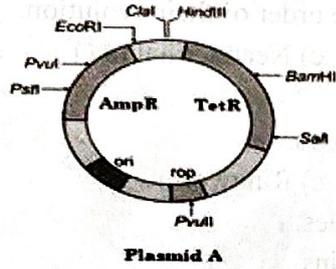
1 x 5 = 5

42. Pollen-pistil interaction is a dynamic process involving pollen recognition followed by promotion or inhibition. Explain.

43. Write the genotype of the individuals given in the table with respect to genetic disorder linked to chromosomes for A, B, C, D and E in the below table

Individuals	Autosomal Dominant	Autosomal Recessive	X - linked Dominant	X - linked Recessive
Normal male	A			
Affected male		B		
Normal female	C		D	
Affected female		E		

44. Given below are the diagrams of plasmids A and B, observe meticulously and answer the questions that follow.



- a) Which is the best plasmid among the two in terms of selecting recombinants and why? 2M
- b) What is insertional inactivation? 1M
- c) What is copy number? Which region in a plasmid controls it? 2M

PART – E
(For visually challenged students only)

12. In a population large number of older individuals than younger ones depict----- in population size

- a) Decline
- b) Growth
- c) Stability
- d) Increase

43. Write about the characteristics of an ideal vector.

Species A	Species B	Species C