

2025

BIOLOGY

(Theory)

Full Marks : 70

Pass Marks : 21

Time : Three hours

All the questions are compulsory.

The figures in the right margin indicate full marks for the questions.

For Question Nos. 1 to 7, select most appropriate one from the given alternatives A, B, C and D and rewrite the same.

1. Mature pollen grain in flowering plants is made up of – 1
(A) One cell
(B) Two cells
(C) Three cells
(D) Four cells
2. Which among the following is a copper releasing contraceptive device? 1
(A) Lippes loop
(B) LNG-20
(C) Multiload 375
(D) Saheli

P.T.O.

3. Gynaecomastia in males is observed in – 1
- (A) Down's syndrome
 - (B) Klinefelter's syndrome
 - (C) Turner's syndrome
 - (D) Phenylketonuria
4. Morphine acts as – 1
- (A) Depressant
 - (B) Stimulant
 - (C) Pain killer
 - (D) Hallucinogen
5. Which of the following is incorrectly matched? 1
- (A) Polio – Bacterial Disease
 - (B) Chikungunya – Viral Disease
 - (C) Tetanus – Bacterial Disease
 - (D) Small pox – Viral Disease
6. Which one of the following is a genetic vector ? 1
- (A) Phage
 - (B) Cosmid
 - (C) Plasmid
 - (D) Artificial chromosome

7. Predict among the following ecologists who estimated that the global species diversity is about seven million – 1

(A) Paul Ehrlich

(B) David Tilman

(C) Alexander Humboldt

(D) Robert May

Question Nos. 8 to 17 are very short answer type questions carrying 1 mark each.

8. What is sporopollenin? 1

9. Why do pollen grains produce in large numbers in anemophilous flower? 1

10. "Second trimester abortions in MTP are much more risky than the first trimester abortion". Justify in one point. 1

11. Define gene migration. 1

12. Skin colour of human is polygenic. Give reason. 1

13. Differentiate between primary sludge and activated sludge by giving one point. 1

14. Microbes can be used as a source of energy. Comment. 1

15. Why is it essential to have selectable marker in cloning vector? 1

16. "*Thermus aquaticus* is preferred in PCR technique". Justify in one point. 1

17. Identify the cause of extinction of dodo in Mauritius island in the Indian Ocean.

1

Question Nos. 18 to 27 are short answer type-II questions carrying 2 marks each.

18. Distinguish between LH and FSH regarding their roles in males and female by giving two points.

2

19. Endosperm development precedes embryo development. Give reason.

2

20. Why are both DNA strands not copied during transcription? Explain.

2

21. "Theory of Chemical evolution is a version of theory of abiogenesis". Analyse the statement.

2

22. In what way biofertiliser enrich the soil nutrients? Give examples.

2

23. State two objectives of GEAC.

2

24. Why does Bt toxin not kill the bacterium that produces it, but kills the insect that ingests it?

2

25. Differentiate between grazing and detritus food chain by giving two points.

2

26. Why are cultural and religious beliefs prove to be helpful in the conservation of biodiversity?

2

27. In a pond, there were 200 lotus plants. Through reproduction the number of lotus plants increased from the original population to 260 in a year. Predict the birth rate of the population.

2

Question Nos. 28 to 33 are short answer type-I questions carrying 3 marks each.

28. Explain in three points that a molecule can act as genetic material. 3

Or

Why are males in some animals heterogametic? Can there be female heterogamety too? Give examples.

29. A patient showed signs of high fever, stomach pain, constipation, headache and loss of appetite but no blood clot in stools. Predict the disease and its pathogen. How does the disease get transmitted? 3

Or

“The biological control of pests and pathogens is preferred to the conventional use of chemical pesticides”. Justify by giving three points.

30. Explain three practical applications of PCR for early diagnosis and treatment of diseases. 3

Or

Explain three therapeutic engineered products along with their use.

31. Differentiate between exponential growth and logistic growth by giving three points. 3

Or

Differentiate between ex-situ and in-situ approaches of conservation of biodiversity in three points.

32. "The number of trophic level in a food chain is limited to four or five". Justify.

3

Or

"Tropics show the greatest levels of species diversity than temperate region".
Analyse by giving three points.

33. Draw the double helical structure of DNA and label –

3

- (i) Minor groove
- (ii) Sugar phosphate backbone

Or

Draw a neat diagram of nucleosome and label –

- (i) DNA
- (ii) H1 histone

Question Nos. 34 to 36 are Essay type questions carrying 5 marks each.

34. Describe five methods of assisted reproductive technology to help infertile childless couples to have children.

5

Or

Define pollination. Describe the three types of pollination depending on the source of pollen with examples.

35. A colour blind man married a woman who is the daughter of a colour blind father and mother homozygous normal vision. Predict the probability of their daughters and sons being colour blind with the help of checker board.

5

Or

In snapdragon tall (DD) is dominant over dwarf (dd) and red flowers (RR) are incompletely dominant over white (rr). A pure tall white is crossed to a pure dwarf red and F_1 are self-fertilized. Predict the genotype and phenotype ratio in F_1 and F_2 generations.

36. Explain five important household products produced by microbes in our day to day life.

5

Or

Explain five harmful effects of drug/alcohol abuse among adolescents now-a-days.