Bhavan's Tripura Vidyamandir
1st Terminal Examination : (2025-2026)

Class : 12 **Subject: Biology**
Time : 3 Hours Total : 70 Marks

Name of the student: Roll: Sec:

General Instructions :
a) All questions are compulsory.
b) The question paper has five sections and 33 questions.
c) Section A has **16 questions** of **1mark** each: Section B has **5 questions** of **2 marks** each; Section C has **7 questions** of **3 marks** each: section D has 2 Case-Based questions of 4 marks each: Section E has 3 questions of 5 marks each.
d) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
e) Wherever necessary, neat and properly labelled diagram should be drawn.

SECTION-A

1. The term "scutellum" is associated with which of the following-
   A. Dicot embryo B. Endosperm
   C. Monocot embryo D. Ovary wall
2. Which layer of the uterus is sloughed off during menstruation?
   A. Perimetrium B. Myometrium
   C. Endometrium D. Epimetrium
3. Select the hormone from the following which is detected in a pregnancy test-
   A. LH B. FSH C. HCG D. Estrogen
4. Which one of the following is not a function of the copper ions released by IUDs?
   A. Increase motility of sperm
   B. Suppress sperm motility
   C. Make uterus unsuitable for implantation
   D. Kill sperms
5. In incomplete dominance, the F1 phenotype is:
   A. Same as one of the parents B. Different from both parents
   C. Identical to both parents D. More dominant than parents
6. In a dihybrid cross involving two heterozygous genes, what is the probability of obtaining offspring that are dominant for only one of the two traits?
   A. 6/16 B. 9/16 C. 3/16 D. 7/16
7. The Hershey-Chase experiment proved that:-
   A. RNA is genetic material B. DNA is genetic material
   C. Proteins are genetic material D. DNA and RNA are equally important
8. Name the enzyme which is responsible for removing supercoils in the DNA during replication-
   A. Helicase B. Ligase
   C. Gyrase (Topoisomerase) D. DNA polymerase
9. Industrial melanism observed in peppered moths is an example of:
   A. Genetic drift B. Mutation
   C. Natural selectionD. D.Artificial selection
10. The similarity in the forelimbs of whales, bats, and humans indicates:
   A. Divergent evolution B.Convergent evolution
   C. Genetic drift D. Mutation

11.Which of the following is the correct sequence for the life cycle of Plasmodium in humans?

A. Sporozoite → Merozoite → Gametocyte → Trophozoite
B. Merozoite → Sporozoite → Trophozoite → Gametocyte
C. Sporozoite → Trophozoite → Schizont → Merozoite
D.Trophozoite → Gametocyte → Merozoite → Sporozoite

12. Name the microbe which is used to produce the immunosuppressive drug Cyclosporin A-

A. Trichoderma polysporum
B. Streptomyces
C. Penicillium notatum
D. Monascus purpureus

Question No- 13 to 16 consists of two statements- Assertion(A) and Reason(R). Answer these questions selecting the appropriate option given below:

A. Both A and R are true and R is the correct explanation of A.
B. Both A and R are true and R is not the correct explanation of A.
C. A is true but R is false.
D. Both Assertion and Reason are false.

13. **Assertion (A):** In many species, pollen viability lasts only a few minutes.
Reason *(R):* *Pollen grains of such species are not shed in the mature stage.*

14. **Assertion (A):** tRNA is called an adaptor molecule.
Reason (R): It carries amino acids to mRNA during protein synthesis.

15. **Assertion (A):** The wings of birds and bats are analogous structures.
Reason (R): Both have evolved from a common ancestor and have similar structure.

16. **Assertion (A):** Morphine is used as a painkiller in medical practice.
Reason (R): It is a stimulant that increases brain activity.

Section-B

17. Give two structural features of wind-pollinated flowers. Name one such plant. (1+1)

OR

How does self-incompatibility influence plant breeding techniques? (2)

18. Mention the fate of Graafian follicle after ovulation. Name the hormone secreted by it. (1+1)

OR

Write the specific location and functions of the following cells in Human males.
(A) Leydig cells (B)Sertoli cells (1+1)

19. Give the role of amniocentesis. Mention the legal status of this technique in India. (1+1)

20. Name the disorder caused by trisomy of chromosome no 21. Mention two symptoms of the disorder. (1+1)

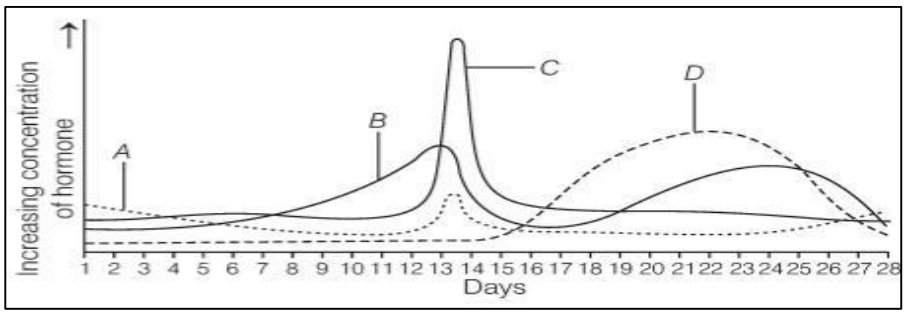
21. Name the codon that initiates protein synthesis. Mention the amino acid it codes for. (1+1)

OR

State the function of the following in protein synthesis:
(A) mRNA (B) rRNA

Section-C

22. A diagram shows menstrual cycle graph.
Identify and label LH and FSH peaks.
Correlate the peaks with ovulation and corpus luteum formation. (0.5+0.5+2)



23. Give an example each for
A) autosomal dominant
B) autosomal recessive and
C) sex-linked recessive disorders in humans.
Mention the cause of any one disorder. (1.5+1.5)

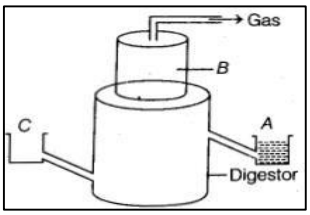
24. A) Explain the mechanism of transcription in prokaryotes with diagram.
B) Mention the role of sigma factor in the process of transcription. (2+1)

25. Mention the role of the following in human evolution:
(A) Ramapithecus (B) Homo habilis (C) Homo erectus (1+1+1)

26. Using Hardy-Weinberg law, explain how genetic equilibrium helps in studying evolutionary changes in a population.

27. A) Describe the role of microbes in sewage treatment.
B) Mention the steps involved in the secondary treatment of sewage. (1+2)

28.



The diagram above is that of a typical biogas plant. Explain the sequence of events occurring in a biogas plant.
Identify A, B and C. (1.5+1.5)

OR

Write the names of any three industrially important products produced by microbes. Name the microbes involved. (3)

Section-D

29. Eye color in Drosophila is an X-linked trait. The red eye is dominant over white. A white-eyed male (X^wY) was crossed with a homozygous red-eyed female (X^RX^R). F_1 generation showed all red-eyed offspring.
Questions:
A) Write the genotype of all F_1 progeny.
B) If F_1 individuals were self-crossed, what phenotypic ratio would you expect in F_2?
C) Which sex will show the white-eyed trait in the F_2 generation, and why? (1+1+1+1)

OR

How does this experiment support the chromosomal theory of inheritance? (2)

30. The lac operon in E. Coli consists of structural genes (lacZ, lacY, lacA), a promoter, an operator, and a regulatory gene (lacI). In the absence of lactose, the repressor protein from lacI binds to the operator, blocking RNA polymerase. In the presence of lactose, the repressor becomes inactive due to binding with an inducer (allolactose), allowing transcription of structural genes for lactose metabolism.

A) Name the structural gene coding for β-galactosidase.
B) State the role of the operator in lac operonn.
C) Write down the function of the lacI gene product. (1+1+2)

OR

A) State the term used for an operon that gets activated in the presence of a substrate.
B) State the result of repressor binding protein to the operator in absence of lactose. (1+1)

Section-E

31. A) How is oogenesis markedly different from spermatogenesis with respect to growth till puberty?
B) Draw sectional view of human ovary. Label follicular stages, ovum, and corpus luteum. (2+3)

OR

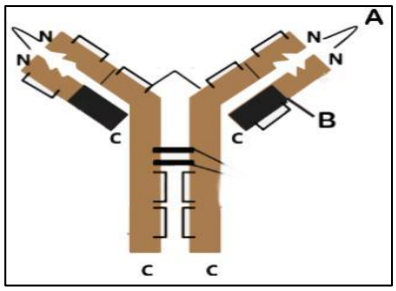
A) Describe the process of fertilization in humans. How is it followed by implantation?
B) Describe the functions of placenta. What hormones does it secrete?

32.A) Name the hormonal composition of oral contraception used by human females.
B) Explain how does it act as contraceptive?
C) How are ZIFT and GIFT different from Intrauterine transfers? Explain. (1+2+2)

OR

A) Discuss the problems and strategies involved in population control in India.
B) Describe the symptoms and causes of any one STDs. (3+2)

33.The pathogen of a disease depends on the RBCs of humans for growth and reproduction. The person with this pathogen suffers from the chill and high fever.
A) Name the disease.
B) Represent the life cycle of the pathogen diagrammatically.
C) Label parts A and B from the following diagram. (1+2+1)



OR

A) Benign tumour is less dangerous than a malignant tumour-State reason.
B) How does a cancerous cell differ from a normal cell?
C) Describe the causes of cancer. (2+2+1)