



ROLL NO.

ST. VIVEKANAND MILLENNIUM SCHOOL
HMT Township, Pinjore
Half Yearly Examination, 2025

Subject: Biology (044)

SET B

Class: XII

Time allowed: 3hrs

MM: 70

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions. All questions are compulsory.
- (iii) Section–A has 16 questions of 1 mark 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; and Section–E has 3 questions of 5 marks each.
- (iv) 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.
- (v) Wherever necessary, neat and properly labelled diagrams should be drawn.

Section-A

1. Find the features which is/are true for hydrophilous flower
 1. Unwetable pollen grain
 2. Large, feathery stigma
 3. Pollens with mucilage covering
 4. Both 1 and 2
2. The part of fallopian tube closest to the ovary is
 1. ampulla
 2. isthmus
 3. infundibulum
 4. cervix
3. Amniocentesis helps in
 1. Increasing DNA number
 2. Early diagnosis of disease like heart failure
 3. Early diagnosis of genetic disorders
 4. Decreasing DNA number
4. A colour blind girl is rare because she will be born only when
 - (1) Her mother and maternal grand father were colour blind
 - (2) Her father and maternal grand father were colour blind
 - (3) Her mother is colour blind and father has normal vision
 - (4) Parents have normal vision but grand parents were colour blind
5. Which form of RNA has a structure resembling with clover leaf?
 1. Messenger RNA
 2. Transfer RNA
 3. Ribosomal RNA
 4. hnRNA

6. Given below are some stages of human evolution. Arrange them in the correct sequence (Past to Recent)
A. Homo habilis B. Homo sapiens C. Homo neanderthalensis
D. Homo erectus
Choose the correct sequence of human evolution from the options given below
1. B-A-D-C 2. C-B-D-A 3. A-D-C-B 4. D-A-C-B
7. Haemozoin is a
1. precursor of haemoglobin
2. toxin released from Streptococcus infected cells
3. toxin released from Plasmodium infected cells
4. toxin released from Haemophilus infected cells.
8. Entry of pollen tube into the ovule takes place through
a. Micropyle b. Chalaza c. Integument
1. Only b 2. Only a 3. Both a and b 4. Both b and c
9. Identify the incorrect statement
1. Lack of menstruation may be indicative of pregnancy
 2. LH & FSH increases gradually during follicular phase
 3. Corpus luteum acts as a temporary endocrine gland
 4. Oestrogens maintain endometrium
10. Major role of oral contraceptive pills is:
1. To check ovulation in female in female by inhibiting the secretion of FSH AND LH
2. To check the secretion of estrogens thus preventing growth of follicles
3. To check the secretion of progesterone thus preventing the corpus luteum life
4. None of these
11. Transplantation of tissues/organs to save certain patients often fails due to rejection of such tissues/organs by the patient. Which type of immune response is responsible for such rejections ?
1. auto-immune response 3. humoral immune response
2. physiological immune response 4. cell-mediated immune response

Assertion-Reason Type Questions

Two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to the following questions from the codes (a), (b), (c) and (d) as given below:

(a) Both A and R are true and R is correct explanation of the assertion.

(b) Both A and R are true but R is not the correct explanation of the assertion.

(c) A is true but R is false. s

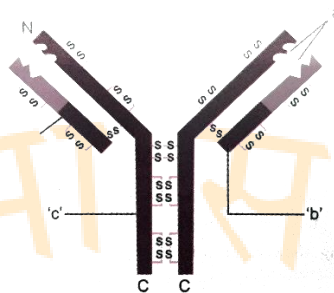
(d) A is false but R is true.

12. Assertion: Griffith experimented with viruses that infect bacteria and called such viruses bacteriophages.
Reason: Griffith was the first scientist to give direct evidence that the DNA transmits the genetic information
13. Assertion: ABO blood group system provides a good example of multiple alleles
Reason: In ABO blood group system, when I and IB alleles are present together, they both express their own types option
14. Assertion: Accumulation of phenylalanine in the brain results in mental retardation in Phenylketonuria
Reason: The affected person lacks phenylalanine which is therefore not converted in tyrosine.
15. Assertion: Primary transcripts in eukaryotes are subjected to splicing to remove the introns.
Reason: Primary transcript contains both exons and introns and the introns are non-functional in eukaryotes.
16. Assertion. Smoking can raise blood pressure and increase heart rate.
Reason. Nicotine stimulates adrenal glands to release adrenaline and nor-adrenaline into the blood circulation, both of which raise blood pressure and increase heart rate.

Section -B

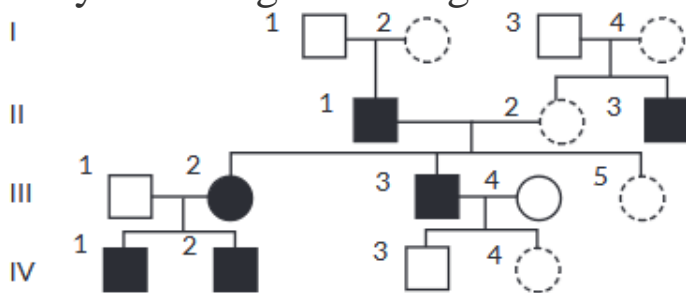
17. Why does the development of endosperm precede that of embryo?
18. Parturition is induced by a complex neuro-endocrine mechanism. Justify
19. Name a disorder a human suffers from a result of monosomy of the sex chromosome. Give the karyotype and write the symptoms.
20. “Appearance of melanised moths post-industrialisation in England is a classic example of evolution by natural selection”. Justify with the help of suitable example for each.

21. Identify a, b and c in the schematic diagram of an antibody and write the chemical nature of a antibody.



Section -C

22. Explain with the help of labelled diagram of the transverse section of a mature anther of an angiosperm plant.
23. Explain the process of hormonal regulation of spermatogenesis.
24. Write the three basic steps followed in the Assisted reproductive technologies (ART) programme to help childless couples. Why is it also known as test tube baby programme?
25. Study the Pedigree chart given below and answer the questions that follow:



- (a) On the basis of the inheritance pattern exhibited in this pedigree chart, what conclusion can you draw about the pattern of inheritance?
- (b) If the female is homozygous for the affected trait in this pedigree chart, then what percentage of her sons will be affected?
- (c) Give the genotype of offsprings 1,2,3 and 4 in III generation.
26. Describe the initiation process of transcription in prokaryotes
27. How does the process of natural selection affect Hardy-weinberg equilibrium? Explain. List the other four factors that disturb the equilibrium.
- 28 Explain the life cycle of plasmodium starting from the its entry in the body of female anopheles till the completion of its life cycle.

Section-D

- 29 In 1981, the health workers of United States of America had become aware of the increased frequency of Kaposi's sarcoma, cancer of the skin and blood

vessels and another disease pneumocystis pneumonia, a respiratory infection caused by a protozoan. Both these diseases were very rare in the general population, but occurred frequently in more severely "immunosuppressed" individuals. This led to the recognition of the immune system disorder that was named Acquired Immune Deficiency Syndrome (AIDS).

In 1983, virologists working in the USA and France had identified a causative agent for 'AIDS', now known as Human Immunodeficiency Virus (HIV). 'HIV' follows a set path to attack the human body to cause the disease.

Based on your understanding of the above information and related studied concepts, answer questions :

- a.. Name the group of cells the HIV attacks after gaining entry into the human body and write the various events that occur within this cell.
- b. Write the expanded form of the diagnostic test used for detecting AIDS. Write the possible treatment available for the disease at present.
- c. Mention any two steps suggested by WHO for preventing the spread of this disease.

30 Read the following and answer the questions given below:- Consider a hypothetical situation: A species of butterflies exhibit a range of wing colours. Butterflies with extremely bright wing colours attract predators easily as compared to the ones with very dull wing colours. Butterflies with very dull wing colours fail to attract mates as compared to the ones with bright wing colours. Butterflies with intermediate wing colours have the best chance of both avoiding predators and finding mates.

(a) Which type of natural selection does this phenomenon exemplify?

Justify your answer.

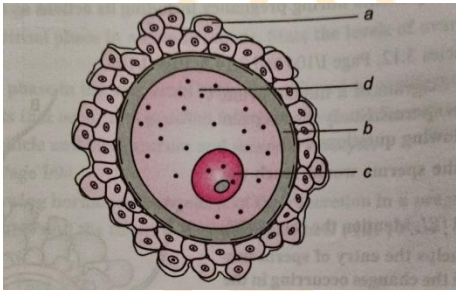
(b) A few years later, the rise in industries and pollution, causes the habitat to become darker. How would it affect the survival of the different kinds of butterflies belonging to this species? Which type of natural selection does this phenomenon exemplify?

(c) In a specific region where this species is prevalent, a mutation in its population leads to butterflies with a shade of wing colours brighter than the existing shades. How would the long-term survivability of this variant be?

Section-E

31. "Use of heavy isotope of nitrogen by Meselson and Stahl demonstrated semi-conservative mode of replication of a DNA molecule." Explain how did they arrive at this conclusion?
32. In a dihybrid cross, white eyed, yellow bodied female *Drosophila* was crossed with red eyed, brown bodied male *Drosophila*. The cross produced 1.3 percent recombinants and 98.7 % progeny with parental type combinations in the F_2 generation. Analyze the above observation and compare with the Mendelian dihybrid cross

33.



Given below is a diagrammatic representation of a human ovum.

- (i) Identify the parts 'a', 'b' and 'c'.
- (ii) This ovum is released from the ovary with incomplete meiotic division. When, where and how is the meiotic division completed?
- (iii) How does an ovum ensure the entry of a single sperm during fertilisation