



BK BIRLA CENTRE FOR EDUCATION
 SARALA BIRLA GROUP OF SCHOOLS
 SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL
 MID TERM EXAMINATION 2024-25
 BIOLOGY (044)



Class: XII
 Date: 25/09/2024

Duration: 3 Hr
 Max. Marks: 70

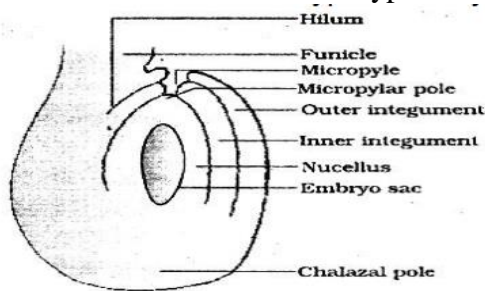
General Instructions:

- i. This question paper contains of 33 questions in 5 sections.
 - ii. All questions are compulsory. However, an internal choice is provided in some questions.
 - iii. Section A consists of 16 objective-type questions carrying 1 mark each.
 - iv. Section B consists of 5 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
 - v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
 - vi. Section D consists of 2 case-based questions of 04 marks each with sub-parts.
 - vii. Section E consists of 3 Long Answer type questions carrying 05 marks each. Answers to these questions should be in the range of 80 to 120 words.
- Wherever necessary, neat and properly labelled diagrams should be drawn.

SECTION-A

1. The structure of bilobed anther consists of 1
 - (a). 2 thecae, 2 sporangia
 - (b). 4 thecae, 4 sporangia
 - (c). 4 thecae, 2 sporangia
 - (d). 2 thecae, 4 sporangia

2. In the figure of anatropous ovule given below, choose the correct option for the characteristic 1
 distribution of cells within the typical embryo sac



	Number of cells at chalazal end	Number of cells at micropylar end	Number of nuclei left in central cell
(a).	3	2	3

(b).	3	3	2
(c).	2	3	3
(d).	2	2	4

3. If mammalian ovum fails to get fertilised, which one of the following is unlikely? 1
- Corpus luteum will disintegrate.
 - Progesterone secretion rapidly declines.
 - Estrogen secretion increases.
 - Primary follicle starts developing.
4. Penetration of the sperm in the ovum is followed by 1
- Formation of first polar body.
 - Completion of meiosis II.
 - First meiosis.
 - Dissolution of zona pellucida.
5. A female undergoing IVF treatment has blocked fallopian tubes the technique by which the embryo with more than 8 blastomeres will be transferred into the female for further development is 1
- ZIFT
 - GIFT
 - IUT
 - AI
6. What would be the genotype of the parents if the offspring have the phenotypes in 1:1 proportion? 1
- Aa X Aa
 - AA X AA
 - Aa X AA
 - Aa x aa
7. Which of the following statements indicates parallelism in genes and chromosomes? 1
- They occur in pairs
 - They segregate during gamete formation
 - They show linkage
 - Independent pairs segregate independently
- (i) and (iii)
 - (ii) and (iii)
 - (i), (ii) and (iii)
 - (i), (ii) and (iv)
8. Total number of nucleotide sequences of DNA that codes for a hormone is 1530. The proportion of different bases in the sequence is found to be Adenine = 34%, Guanine = 19%, Cytosine = 23%, Thymine = 19%. Applying Chargaff's rule, what conclusion can be drawn? 1
- It is a double stranded circular DNA.
 - It is a single stranded DNA.
 - It is a double stranded linear DNA.

(d). It is a single stranded DNA coiled on Histones.

9. Which of the following amino acid residues will constitute the histone core? 1
- (a). Lysine and Arginine
 - (b). Asparagine and Arginine
 - (c). Glutamine and Lysine
 - (d). Asparagine and Glutamine
10. Evolutionary convergence is development of a 1
- (a). Common set of functions in groups of different ancestry.
 - (b). Dissimilar set of functions in closely related groups.
 - (c). Common set of structures in closely related groups.
 - (d). Dissimilar set of functions in unrelated groups.
11. Interferons are most effective in making non-infected cells resistant against the spread of which of the following diseases in humans? 1
- (a). ascariasis
 - (b). ringworm
 - (c). amoebiasis
 - (d). AIDS
12. Match the following list of bacteria and their commercially important products: 1
- | Bacterium | Product |
|---------------------------------|------------------|
| A. <i>Aspergillus niger</i> | i. Lactic acid |
| B. <i>Acetobacter aceti</i> | ii. Butyric acid |
| C. <i>Clostridium butylicum</i> | iii. Acetic acid |
| D. <i>Lactobacillus</i> | iv. Citric acid |
- Choose the correct match:
- (a). A-ii, B-iii, C-iv, D-i
 - (b). A-ii, B-iv, C-iii, D-i
 - (c). A-iv, B-iii, C-ii, D-i
 - (d). A-iv, B-i, C-iii, D-ii

Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions by 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) A is false but R is true.

13. 1
- Assertion (A): The uterus is single and it is also called womb.
Reason (R): The external thin layer of the uterus wall is called perimetrium.
14. Assertion (A): Variations are important for the process of evolution. 1
Reason(R): Meiosis increases the genetic variability in the population of organisms from one generation to the next.
15. Assertion (A): *Streptococcus pneumoniae* and *Haemophilus influenzae* are responsible for causing infectious diseases in human beings. 1

Reason(R): A healthy person acquires the infection by inhaling the droplets/aerosols released by an infected person.

16. Assertion (A): Microbes are present even at sites where no other life-form could possibly exist. 1
Reason(R): It cannot survive deep inside the geysers (thermal vents) where the temperature may be as high as 100°C, deep in the soil, under the layers of snow several metres thick, and is highly acidic environments.

SECTION-B

17. Differentiate between: 2
(a). True and False fruits
(b). Perisperm and Pericarp
18. How can STDs be prevented? 2
19. A colour blind child is born to a normal couple. Work out a cross to show how it is possible. 2
Mention the sex of this child.
20. Explain homologous and analogous organs with examples. 2
21. Why are some molecules called bioactive molecules? Give two examples of such molecules. 2

OR

Write a short note on the use of biofertilisers.

SECTION-C

22. State the agent(s) which helps in pollinating in the following plants. Explain the adaptations in these plants to ensure pollination: 3
(a). Corn
(b). Water hyacinth
(c). Vallisneria
23. Explain the functions of the following structures in the human male reproductive system. 3
(a). Scrotum
(b). Leydig cells
(c). Male accessory glands
24. Write a short note on any three contraceptive methods. 3
25. (a). What is chromosomal theory of inheritance? 3
(b). Explain the term linkage and recombination.

26. 3



- (a). Explain the process by which Tasmanian wolf evolved.
(b). Name the process that has resulted in evolution of wolf and another similar animal such as Tasmanian wolf.
(c). Compare and contrast the two animals shown?
27. Explain the process of transcription in Bacteria. 3

OR

- What is repetitive DNA and satellite DNA? How are VNTR useful?
28. Draw and explain the working of biogas plant 3

SECTION-D

29. Study the schematic representation of the genes involved in the lac operon given below and answer the questions that follow:



- (a). The active site of enzyme permease present in the cell membrane of a bacterium has been blocked by an inhibitor, how will it affect the lac operon? 2
- (b). The protein produced by the *i* gene has become abnormal due to unknown reasons. Explain its impact on lactose metabolism stating the reason. 1
- (c). If the nutrient medium for the bacteria contains only galactose; will operon be expressed? Justify your answer. 1

OR

What is negative regulation of lac operon?

30. (a). Why do farmers prefer biofertilisers to chemical fertilisers these days? Explain. 4
- (b). How do Anabaena and mycorrhiza act as biofertilisers?
- (c). Name the enzyme produced by Streptococcus bacterium. Explain its importance in medical science.
- (d). Name the genus to which baculoviruses belong. Describe their role in the integrated pest management programmes.

OR

Mention the importance of lactic acid bacteria to humans other than converting milk into curd.

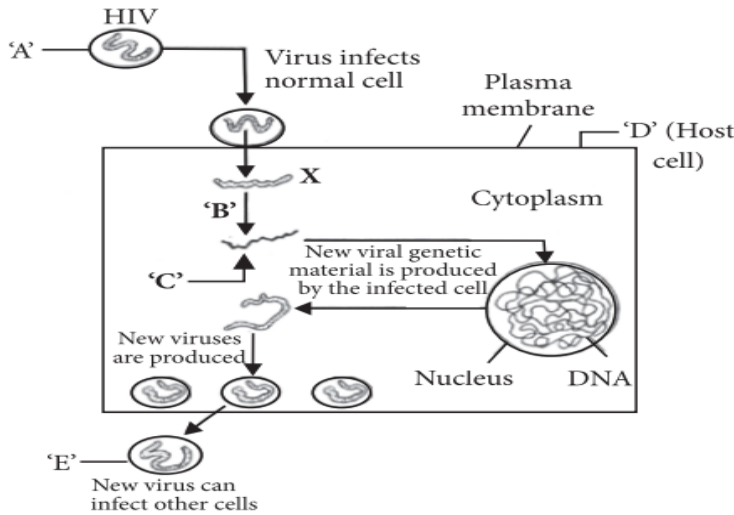
SECTION-E

31. Differentiate between spermatogenesis and oogenesis. 5

OR

‘Parturition is induced by a complex Neuro endocrine mechanism’. Justify

32. Study the diagram showing replication of HIV in humans and answer the following questions accordingly. 5



1
2
1
1

- Write the chemical nature of the coat 'A'.
- Name the enzyme 'B' acting on 'X' to produce molecule 'C'. Name 'C'.
- Mention the name of the host cell 'D' the HIV attacks first when it enters the human body.
- Name the two different cells the new viruses 'E' subsequently attack.
- What is the full form of HIV and AIDS?

OR

- What makes some viruses cause cancer in humans?
- How do benign tumors turn malignant? How does the latter harm the human body?
- How can cancer be detected and diagnosed?
- How can cancer be treated?

33.
 - Why is sickle cell anaemia, a human blood disorder so named? 1
 - Explain the genetic basis that results in the expression of this disorder. 2
 - Work out a cross to explain how normal parents may have a sickle cell anaemic child. 2

OR

- Explain the cause and effect of Thalassaemia. 3
- Write a short note on Phenylketonuria. 2

*****ALL THE BEST*****