

Class XII | Session 2026-27
Subject - Biology
Sample Question Paper - Set 10

General Instructions:

1. All questions are compulsory.
2. The question paper has five sections and 33 questions. All questions are compulsory.
3. 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.
4. 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.
5. Wherever necessary, neat and properly labeled diagrams should be drawn.

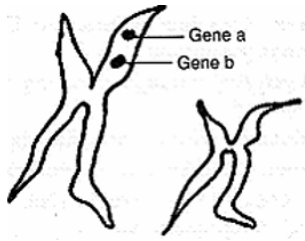
Section A

1. Which of the following is the correct food chain? [1]
 - a) Frog → Snake → Eagle
→ Grasshopper → Grass
 - b) Grass → Grasshopper → Frog → Snake
→ Eagle
 - c) Eagle → Snake → Grasshopper → Grass
→ Frog
 - d) Grasshopper → Grass → Snake
→ Frog → Eagle
2. Name the spermicidal cream developed by Central Drug Research Institute (Lucknow), India. [1]
 - a) Consap
 - b) Sapindus
 - c) Spermacid
 - d) Corovira
3. Which one of the following is related to ex-situ conservation of threatened animal and plants? [1]
 - a) Himalayan region
 - b) Biodiversity hotspots
 - c) Wildlife Safari Parks
 - d) Amazon rainforest
4. A mother of one-year-old daughter wanted to space between her children. The best contraceptive method she should use is: [1]
 - a) Tubectomy
 - b) Oral contraceptives
 - c) Copper-T
 - d) Diaphragm
5. The source of Taq polymerase used in PCR is a: [1]
 - a) Thermophilic fungus
 - b) Thermophilic bacterium
 - c) Mesophilic fungus
 - d) Halophilic bacterium

6. The technology of biogas production was developed in India mainly due to the efforts of: [1]

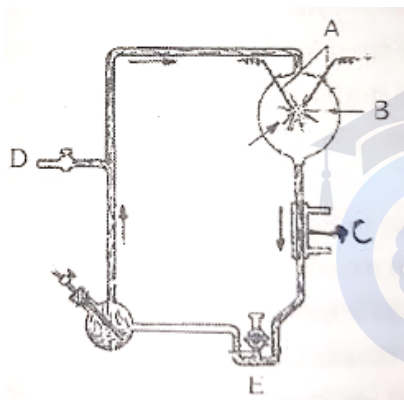
- a) ISRO
- b) Pusa Agriculture
- c) IARI and KVIC
- d) ICRI and KVIC

7. Given below is a highly simplified representation of human sex chromosomes from a karyotype. The genes a and b could be of: [1]



- a) Attached ear lobe and Rh blood group
- b) Haemophilia and red green colour blindness
- c) Colour blindness and body height
- d) Phenylketonuria and haemophilia.

8. The diagram represents miller's experiment. Choose the correct combination of labelling. [1]



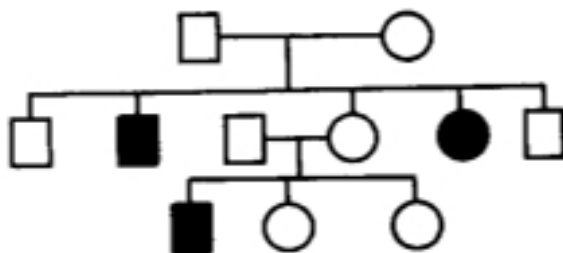
- a) A-electrodes, B- $\text{NH}_3 + \text{H}_2\text{O}$, C-hot water, D-tap, E-U trap
- b) A-electrodes, B- $\text{NH}_4 + \text{H}_2 + \text{CO}_2 + \text{CH}_3$, C-hot water, D-vacuum, E-U trap
- c) A-electrodes, B- $\text{NH}_3 + \text{H}_2 + \text{H}_2\text{O} + \text{CH}_4$, C-steam, D-vacuum, E-U trap
- d) A-electrodes, B- $\text{NH}_3 + \text{H}_2 + \text{H}_2\text{O} + \text{CH}_4$, C-cold water, D-vacuum, E-U trap

9. Stability of ecosystem depends upon: [1]

- a) Interchange between producers and consumers
- b) Number of producers
- c) Primary productivity
- d) Number of consumers

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10. Study the pedigree chart given below: [1]



What does it show?

- a) Inheritance of a recessive sex-linked disease like haemophilia
- b) The pedigree chart is wrong as this is not possible

- c) Inheritance of a sex-linked inborn error of metabolism like phenylketonuria
- d) Inheritance of a condition like phenylketonuria as an autosomal recessive trait
11. Bacterium *Propionibacterium shermanii* is used in the preparation of edible product: [1]
- a) Idli
- b) Swiss cheese
- c) Curd
- d) Roquefort cheese
12. Which native plasmid did Stanley Cohen and Herbert Boyer use for the construction of the first recombinant DNA? [1]
- a) *Streptococcus pneumoniae*
- b) *Haemophilus influenzae*
- c) *Escherichia coli*
- d) *Salmonella typhimurium*
13. **Assertion (A):** A medical termination of pregnancy is legally allowed upto the 28th week of pregnancy. [1]
Reason (R): MTP is done if family physician or gynaecologist consider the need for abortion.
- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.
14. **Assertion:** BOD is a measure of the organic matter present in the water. [1]
Reason: BOD refers to the amount of oxygen that would be consumed if all the organic matter in one litre of water were oxidised by bacteria.
- a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
- b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
- c) Assertion is correct statement but reason is wrong statement.
- d) Assertion is wrong statement but reason is correct statement.
15. **Assertion (A):** A pyramid of numbers can neither be inverted. [1]
Reason (R): The number of insects feeding on a big tree is more than the number of trees on which insects are feeding.
- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.
16. **Assertion:** Life originated by chance coming together of necessary chemicals through a series of chemical reactions (abiogenesis). [1]
Reason: Abiogenesis has not been experimentally proved.
- a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
- b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
- c) Assertion is correct statement but reason is wrong statement.
- d) Assertion is wrong statement but reason is correct statement.

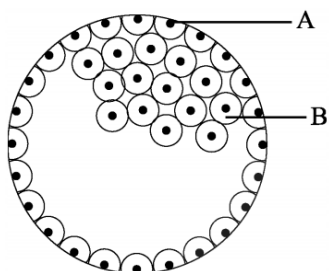
Section B

17. a. Differentiate between humoral immune response and cell-mediated immune response. [2]
b. Draw a schematic diagram of an antibody molecule and label any four parts.

18. i. Construct a complete transcription unit with promotor and terminator on the basis of the hypothetical template strand given below. [2]
ii. Write the RNA strand transcribed from the above transcription unit along with its polarity.



19. Mention any two characteristics of pollen in plants such as maize and coconut palm to suit the kind of pollination in them. [2]
20. In the given figure, give the name and functions of parts labelled A and B. [2]



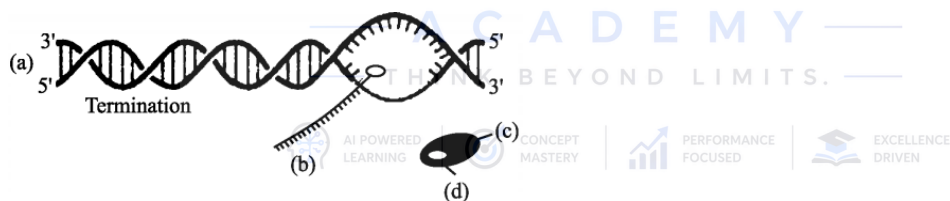
21. Explain the role of the following during the sewage treatment: [2]
a. flocs
b. anaerobic sludge digester

OR

- a. Give an example of viral biocontrol agent.
b. Why are they considered to be desirable when an ecologically sensitive area is being treated?

Section C

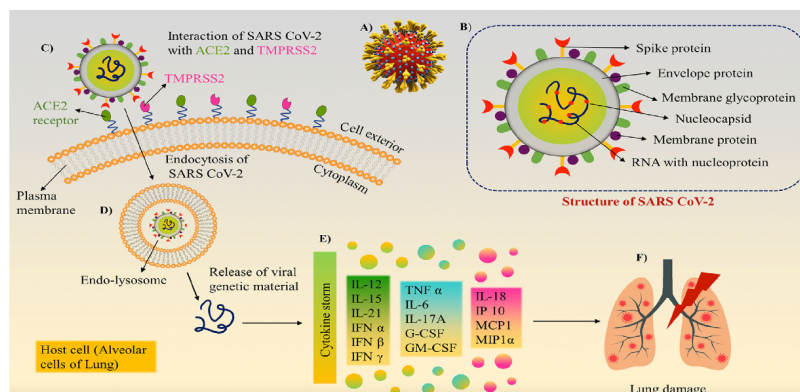
22. The process of termination during transcription in a prokaryotic cell is being represented here. Name the label a, b, c and d. [3]



23. Generally, it is observed that human males suffer from hemophilia more than human females, who rarely suffer from it. Explain giving reasons. [3]
24. Study the table showing the population interaction between species Z and Y respectively. Assign the appropriate +/- signs for A, B, D, E and respective interactions for C and F. [3]

Species 'Z'	Species 'Y'	Name of Interaction
A	B	Mutualism
-	-	C
D	E	Parasitism
+	O	F

25. This image shows how lungs are damaged by SARS CoV-2 and how molecular diagnostic techniques help to diagnose it. [3]



- List the three molecular diagnostic techniques that help to detect pathogens from suspected patients.
- Mention one advantage of these techniques over conventional methods.

26. a. **For ethical reasons, biodiversity must be conserved.** Do you agree? Write your views in support of your answer. [3]
- b. Write the characteristic features of a specific area on the basis of which it is designated as a **hot spot**. Write any one major threat to these areas.

OR

How have the following factors affected the biodiversity of an area? Explain.

- Habitat loss and fragmentation
- Over-exploitation

27. Comment on the statement that evolution and natural selection are end result or consequence of some other processes but themselves do not process. [3]
28. How does a vaccine for a particular disease immunise the human body against that disease? [3]

Section D

29. **Read the following text carefully and answer the questions that follow:** [4]

Cleavage is the series of rapid mitotic divisions in zygote and forms blastula. The 2, 4, 8, 16 daughter cells are called blastomeres. Embryo with 64 blastomeres is known as blastocyst and has blastocoel cavity. Blastocyst gets implanted in uterine wall and leads to pregnancy.

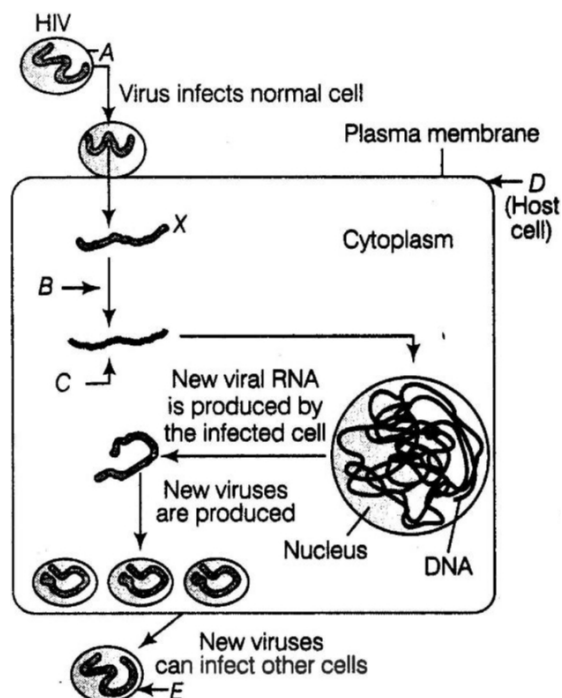
- Why the cells of the inner cell mass of blastocyst are called stem cells? (1)
- At which stage of embryonic development trophoblast develops? (1)
- What is the site of implantation? (2)

OR

What is the correct sequence of various structures formed during embryonic development? (2)

30. **Read the following text carefully and answer the questions that follow:** [4]

Study the diagram showing replication of HIV in humans:



- i. Write the chemical nature of the coat A. (1)
- ii. Name the enzyme B acting on X to produce molecule C. Name C. (1)
- iii. Mention the name of the host cell D the HIV attacks first when it enters into the human body. (2)

OR

Name the two different cells the new viruses E subsequently attack. (2)

Section E

31. Trace the development of microspore mother cell in the anther to a mature pollen grain. [5]

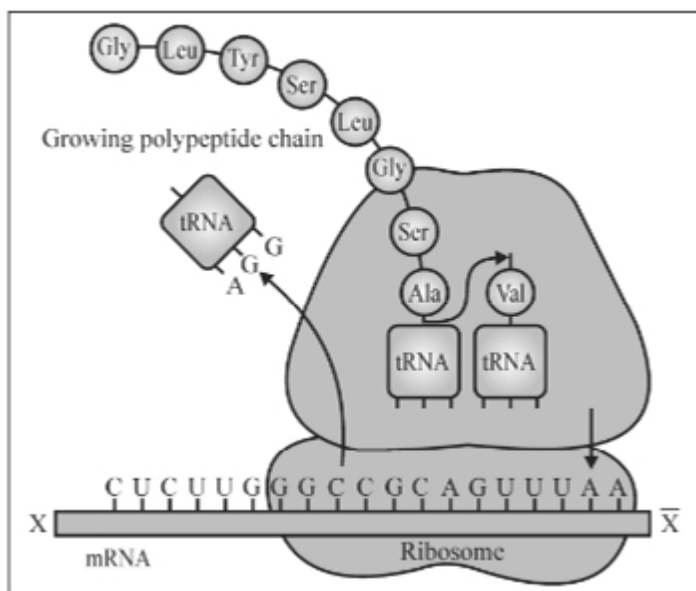
OR

- i. Show the development of megaspore mother cell upto the formation of mature embryo sac in flowering plants with the help of labelled diagrams only.
- ii. How does geitonogamy differ from xenogamy?
- iii. Name the type of flowers that are invariably autogamous.

32. i. Name and describe the technique which is an important tool of forensic science. [5]
- ii. Mention any two applications of this technique other than its use in forensic studies.

OR

Study the schematic diagram given below and answer the questions that follow:

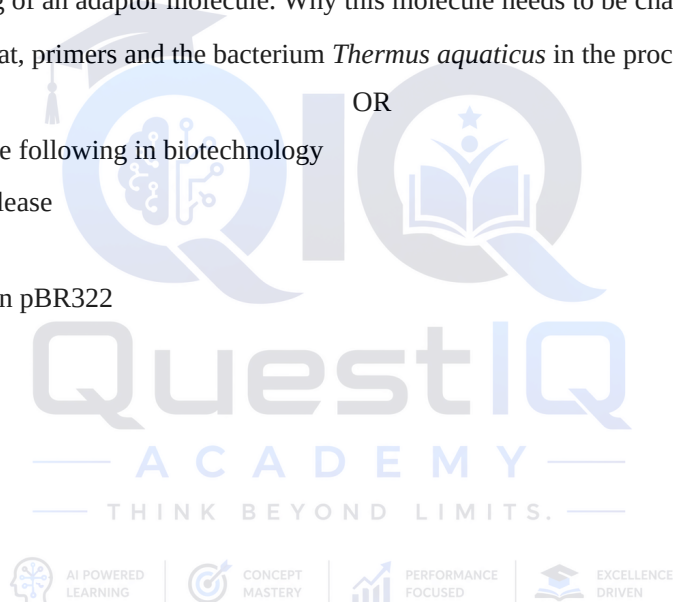


- Identify the polarity from **X** to $\overline{\text{X}}$ in the mRNA segment shown. Mention how many more amino acids can be added to the polypeptide that is being translated and why.
 - Write the initiating codon for translation, its anticodon and the amino acid it codes for.
 - Explain the charging of an adaptor molecule. Why this molecule needs to be charged?
33. Describe the roles of heat, primers and the bacterium *Thermus aquaticus* in the process of PCR. [5]

OR

Explain the role(s) of the following in biotechnology

- Restriction endonuclease
- Gel-electrophoresis
- Selectable markers in pBR322



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