

SAMPLE PAPER 1 2024-25

Class 12 - Biology

Time Allowed: 3 hours

Maximum Marks: 70

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 one forms the endosperm: [1]
 - a) Synergids
 - b) Antipodal cells
 - c) Oospore
 - d) Secondary or polar nuclei
2. Mycorrhiza is an example of: [1]
 - a) Parasitism
 - b) Saprophytism
 - c) Thyroxine
 - d) Symbiosis
3. If in a population, natality is balanced by mortality, then there will be: [1]
 - a) Zero population growth
 - b) Increase in population growth
 - c) Decrease in population growth
 - d) Over population
4. Enzyme that cuts DNA is [1]
 - a) DNA lyase
 - b) DNA polymerase
 - c) DNA ligase
 - d) Restriction endonuclease
5. In which of the following protected areas land patches will be permitted for grazing, plantation, and cultivation? [1]
 - a) Sanctuaries only
 - b) both Biosphere reserves & National parks
 - c) National parks only
 - d) Biosphere reserves only
6. The first movements of the foetus and appearance of hair on its head are usually observed during which month of pregnancy? [1]
 - a) Fifth month
 - b) Fourth month

c) Sixth month

d) Third month

7. The cutting out of separated bands of DNA from the agarose gel is called:

[1]

a) Elution

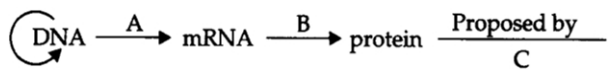
b) Polymerisation

c) Electrophoresis

d) Annealing

8. The diagram shows an important concept in the genetic implication of DNA. Fill in the blanks A to C.

[1]



a) A - translation B - transcription C - Erevin
Chargaff

b) A - translation B - extension C - Rosalind
Franklin

c) A - transcription B - translation C - Francis
Crick

d) A - transcription B - replication C - James
Watson

9. In ovule, archesporial cell differentiates from nucleus:

[1]

a) At chalazal region

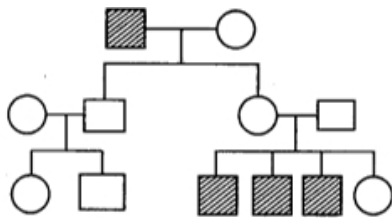
b) Middle of nucellus

c) Hypodermally in the micropylar region

d) Laterally near endothelium

10. In the given pedigree the shaded figures denote individuals expressing a specific trait:

[1]



Which of the following is the most probable mode of inheritance of this trait?

a) X-linked recessive transmission

b) Simple Mendelian Recessive

c) Codominant relationship of a single pair of
alleles

d) X-linked dominant transmission

11. DNA replication includes:

[1]

a) All of these

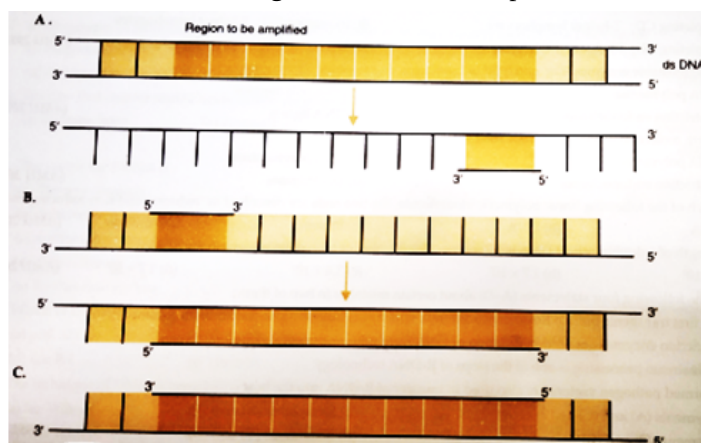
b) RNA polymerase

c) DNA polymerase and ligase

d) DNA ligase

12. The figure below shows three steps (A, B, C) of Polymerase Chain Reaction (PCR). Select the option giving correct identification together with what it represents?

[1]



a) C - extension in the presence of heat stable
DNA polymerase.

b) A - denaturation at a temperature of about
50°C.

- c) B - denaturation at a temperature of about 98°C separating the two DNA strands. d) A - annealing with two sets of primers.

13. **Assertion (A):** In humans, most sex-linked genes are present on the X-chromosome. [1]

Reason (R): X-chromosome contains a large number of genes with major effects on phenotype.

- 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 (A):** Without variations, evolution is impossible. [1]

Reason (R): Only useful variations are transmitted to the next generation.

- 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.

15. **Assertion (A):** Temin modified Crick's **central dogma** to **central dogma reverse**. [1]

Reason (R): Crick was of the view that flow of genetic information in cells is bidirectional.

- 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 (A):** Injecting the microbes deliberately during immunization induces passive immunity. [1]

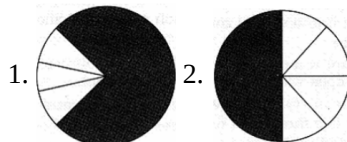
Reason (R): Antibodies are directly given to protect the body against poliovirus.

- 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.

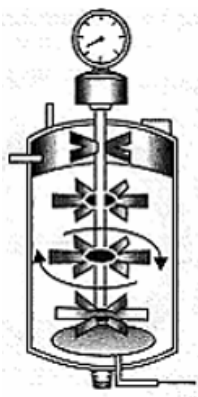
Section B

17. What are the uses of antibiotics? [2]

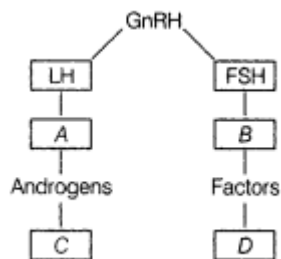
18. In the pie chart (a) and (b) drawn below to show the global animal diversity, which group of animals would you name and write on the areas shaded back in (a) and (b). In which kind of habitat would you find these groups of animals? [1]



19. Name the type of bioreactor shown. Write the purpose for which it is used. [2]



20. Identify A, B, C and D with reference to gametogenesis in humans, in the flow chart given below. [2]



21. List any three important characteristics of a population and explain. [2]

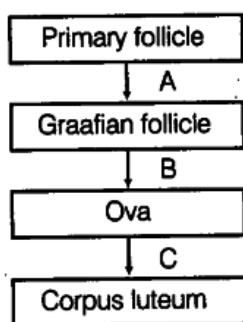
OR

- Write the observations made at the end of Connell's field experiment on barnacles on the rocky sea coasts of Scotland.
- Name any two categories of organisms that in general are adversely affected by competition.

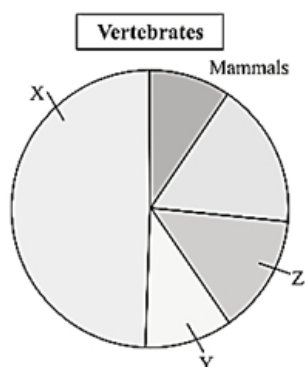
Section C

22. Describe the functions of anaerobic sludge in a sewage treatment plant. [3]

23. Given below is a flow chart showing ovarian change during the menstrual cycle and answer the following questions: [3]



- Write the hormonal factor(s) responsible for the events shown as A, B, and C.
 - Write the functions of the following:
 - Corpus luteum
 - Endometrium
24. You must have read in the news paper that some children suffering from Thalesemia became HIV positive due to negligence of a hospital. What negligence has been made on part of hospital authorities in your opinion? [3]
25. Given below is a **pie chart** representing global biodiversity: [3]
- a proportionate number of species of major taxa.



- Identify (X) and (Y) in the given **pie chart**.
- Extinction of species across taxa are not random.** Which group amongst the vertebrates is more vulnerable to extinction?
- Give one example each of recent extinctions of species in Russia, Mauritius and Australia.

26. Write the mode of pollination in Vallisneria and water lily. Explain the mechanism of pollination in Vallisneria. [3]

OR

Draw a schematic labeled diagram of a fertilized embryo sac of an angiosperm.

27. Snake charmer came to the house and smelled the presence of a cobra which the residents had never seen in the last 10 years. The landlord agreed to allow the man to search, catch and take away with him the snake. Little Jazman disagreed and drove the man away. [3]

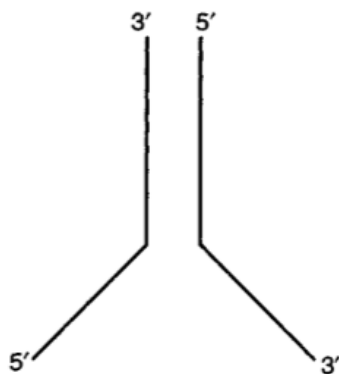
- Did Jazman do the right thing? What values did he show?
- What importance do snakes have in nature?
- Draw a food web showing the place of snakes.

28. All reproductive tract infections (RTIs) are STDs, but all STDs are not RTIs. Justify with example. [3]

Section D

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

Study the image below:



- Identify the structure shown above. (1)
- Redraw the structure as a replicating fork and label the parts. (1)
- Write the source of energy for this replication and list the enzymes involved in this process. (2)

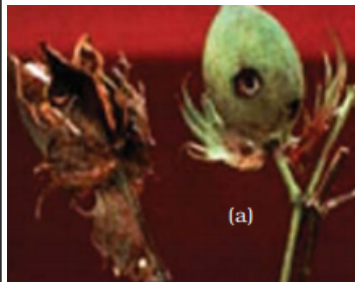
OR

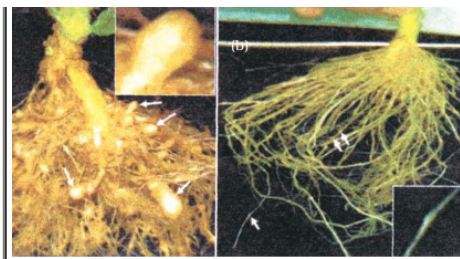
Mention the difference in the synthesis based on the polarity of the two template strands. (2)

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

GM is a technology that involves inserting DNA into the genome of an organism. To produce a GM plant, new DNA is transferred into plant cells. Usually, the cells are then grown in tissue culture where they develop into plants. The seeds produced by these plants will inherit the new DNA.

Given below is a table depicting the different genetically engineered plants and the organism used.

Genetically engineered plants	Organism used
	(a) _____
	(b) _____



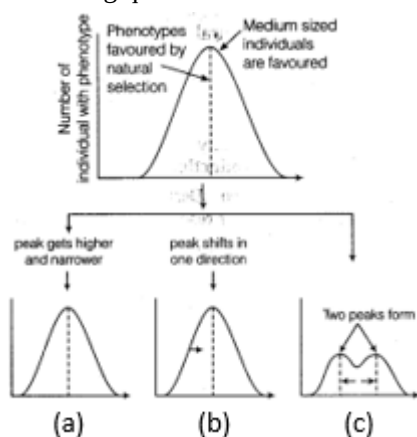
- i. Name the organisms used in (a) and (b). (1)
- ii. Write the name of plants (a) and (b). (1)
- iii. Which organisms infect the plants? (2)

OR

How do these plants are genetically engineered? (2)

Section E

31. Observe the diagram given below for the operation of natural selection on different traits and answer the following questions: [5]



- i. Name A, B, and C mentioned in the above diagram.
- ii. Give one example of directional selection.
- iii. Write the name of factors affecting the Hardy-Weinberg Equilibrium.

OR

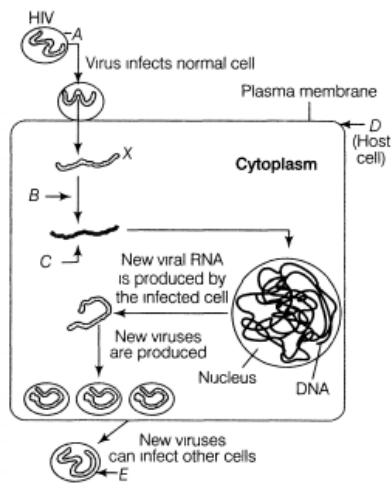
- i. Describe the observations made on the collection of white-winged moths and dark-winged moths in England between the years 1850 and 1920. What did these observations lead to?
- ii. How is the use of herbicides, pesticides and antibiotics by humans for various purposes, comparable with the observations made on moths in the above question? What is this type of phenomenon called?

32.
 - i. Name the nematode (scientific name) that infects the roots of tobacco plant and reduces its yield. [5]
 - ii. Name the vector that is used to introduce nematode-specific genes into the host plant (tobacco).
 - iii. How do sense and anti-sense RNAs function?
 - iv. Why could parasite not survive in a transgenic tobacco plant?

OR

Name the process involved in the production of nematode-resistant tobacco plants, using genetic engineering. Explain the strategy adopted to develop such plants.

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

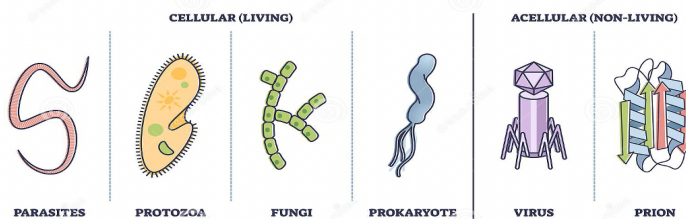


- Write the chemical nature of the coat A.
- Name the enzyme B acting on X to produce molecule C. Name C.
- Mention the name of the host cell D the HIV attacks first when it enters into the human body. **OR**
- Name the two different cells the new viruses E subsequently attack.

OR

The pathogen of a disease depends on RBCs of human for growth and reproduction. The person with this pathogen suffers with chill and high fever.

TYPES OF PATHOGENS



- Identify the disease.
- Name the pathogen.
- What is the cause of fever? **OR**
- Represent the life cycle of the pathogen diagrammatically.

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