

## Question Paper

Conducted by the Central Board of Secondary Education (CBSE)



Time Allowed: 3 Hours

Maximum Marks: 70

### General Instructions

- (i) This question paper contains **26 questions** in five sections. All questions are compulsory.
- (ii) Section A: Questions 1 to 5 are Very Short Answer type questions of 1 mark each.
- (iii) Section B: Questions 6 to 10 are Short Answer type I questions of 2 marks each.
- (iv) Section C: Questions 11 to 22 are Short Answer type II questions of 3 marks each.
- (v) Section D: Question 23 is a Value Based Question of 4 marks.
- (vi) Section E: Questions 24 to 26 are Long Answer type questions of 5 marks each.
- (vii) There is no overall choice. Internal choice is provided in one question of 2 marks, one question of 3 marks and all three questions of 5 marks. Attempt one of the two alternatives in each such question.

## Section A

1. A herd of cattle is showing reduced fertility and productivity. Provide one reason and one suggestion to overcome this problem.

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2. An electrostatic precipitator in a thermal power plant is not able to generate high voltage of several thousands. Write the ecological implication because of it.

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3. Name the specific type of gene that is incorporated in a cotton plant to protect the plant against cotton boll worm infestation.

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4. State two postulates of Oparin and Haldane with reference to origin of life.

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5. Name the type of cross that would help to find the genotype of a pea plant bearing violet flowers.

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## Section B

6. Name the type of immunity the colostrum provides to a newborn baby. Write giving an example where this type of immunity should be provided to a person.

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7. List four benefits to human life by eliminating the use of CFCs.

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OR

7. Suggest two practices giving one example of each, that help protect rare or threatened species.

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8. Write the binomials of two fungi and mention the products/bioactive molecules they help to produce.

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9. Differentiate between the genetic codes given below:

(a) Unambiguous and Universal

(b) Degenerate and Initiator

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10. "Pollen grains in wheat are shed at 3-celled stage while in peas they are shed at 2-celled stage." Explain. Where are germ pores present in a pollen grain?

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## Section C

11. (a) List the two methodologies which were involved in human genome project. Mention how they were used.

(b) Expand 'YAC' and mention what was it used for.

12. Describe the inter-relationship between productivity, gross primary productivity and net productivity.

13. Explain the process of pollination in Vallisneria. How is it different in water-lily, which is also an aquatic plant?

14. Both Haemophilia and Thalassemia are blood related disorders in humans. Write their causes and the difference between the two. Name the category of genetic disorder they both come under.

15. What is disturbance in Hardy-Weinberg genetic equilibrium indicative of? Explain how it is caused.

16. Name a human disease, its causal organism, symptoms (any three) and vector, spread by intake of water and food contaminated by human faecal matter.

OR

16. (a) Why is there a fear amongst the guardians that their adolescent wards may get trapped in drug/alcohol abuse?

(b) Explain 'addiction' and 'dependence' in respect of drug/alcohol abuse in youth.

17. Describe the roles of heat, primers and the bacterium *Thermus aquaticus* in the process of PCR.

18. Different animals respond to changes in their surroundings in different ways. Taking one example each, explain "some animals undergo aestivation while some others hibernation". How do fungi respond to adverse climatic conditions?

19. Explain the various steps involved in the production of artificial insulin.

20. (a) Explain the significance of 'palindromic nucleotide sequence' in the formation of recombinant DNA.

(b) Write the use of restriction endonuclease in the above process.

21. Secondary treatment of the sewage is also called Biological treatment. Justify this statement and explain the process.

22. (a) Write the desirable characters a farmer looks for in his sugarcane crop.

(b) How did plant breeding techniques help north Indian farmers to develop cane with desired characters?

23. It is commonly observed that parents feel embarrassed to discuss freely with their adolescent children about sexuality and reproduction. The result of this parental inhibition is that the children go astray sometimes.

(a) Explain the reasons that you feel are behind such embarrassment amongst some parents to freely discuss such issues with their growing children.

(b) By taking one example of a local plant and animal, how would you help these parents to overcome such inhibitions about reproduction and sexuality?

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## Section E

**24.** (a) Compare, giving reasons, the J-shaped and S-shaped models of population growth of a species.

(b) Explain 'fitness of a species' as mentioned by Darwin.

OR

**24.** (a) What is an ecological pyramid? Compare the pyramids of energy, biomass and numbers.

(b) Write any two limitations of ecological pyramids.

**25.** (a) Explain Polygenic inheritance and Multiple allelism with the help of suitable examples.

(b) "Phenylketonuria is a good example that explains Pleiotropy." Justify.

OR

**25.** (a) What is an operon?

(b) Explain how a polycistronic structural gene is regulated by a common promoter and a combination of regulatory genes in a lac-operon.

**26.** (a) When a seed of an orange is squeezed, many embryos, instead of one are observed. Explain how it is possible.

(b) Are these embryos genetically similar or different? Comment.

OR

**26.** (a) Explain the following phases in the menstrual cycle of a human female:

(i) Menstrual phase

(ii) Follicular phase

(iii) Luteal phase

(b) A proper understanding of menstrual cycle can help immensely in family planning. Do you agree with the statement? Provide reasons for your answer.

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