

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. Our government has intentionally imposed strict conditions for M.T.P. in our country. Justify giving a reason.

2. State the fate of a pair of autosomes during gamete formation.

3. What role does an individual organism play as per Darwin's theory of natural selection?

4. Suggest a method to ensure an anamnestic response in humans.

5. What is biopiracy?

Section B

6. A mature embryo-sac in a flowering plant may possess 7-cells, but 8-nuclei. Explain with the help of a diagram only.

7. Describe the structure of a nucleosome.

OR

7. Mention the evolutionary significance of the following organisms:

- (a) Shrews
- (b) Lobefins
- (c) Homo habilis
- (d) Homo erectus

8. In an agricultural field there is a prevalence of the following organisms and crop diseases which are affecting the crop yield badly:

- (a) White rust
- (b) Leaf and stripe rust
- (c) Black rot
- (d) Jassids

Recommend the varieties of crops the farmers should grow to get rid of the existing problem and thus improve the crop yield.

9. How does the application of the fungal genus, Glomus, to the agricultural farm increase the farm output?

10. Plenty of algal bloom is observed in a pond in your locality.

- (a) Write what has caused this bloom and how does it affect the quality of water.
- (b) Suggest a preventive measure.

Section C

11. (a) List the three stages the annuals and biennial angiosperms have to pass through during their life cycle.

(b) List and describe any two vegetative propagules in flowering plants.

12. Draw a labelled diagrammatic sectional view of a human seminiferous tubule.

13. During a medical investigation, an infant was found to possess an extra chromosome 21. Describe the symptoms the child is likely to develop later in the life.

14. A number of passengers were severely burnt beyond recognition during a train accident. Name and describe a modern technique that can help hand over the dead to their relatives.

15. $p^2 + 2pq + q^2 = 1$. Explain this algebraic equation on the basis of Hardy Weinberg's principle.

16. (a) What precaution(s) would you recommend to a patient requiring repeated blood transfusion?

(b) If the advice is not followed by the patient, there is an apprehension that the patient might contract a disease that would destroy the immune system of his/her body. Explain with the help of schematic diagram only how the immune system would get affected and destroyed.

17. (a) What is inbreeding depression?

(b) Explain the importance of "selection" during inbreeding in cattle.

18. Describe how do 'flocs' and 'activated sludge' help in Sewage Treatment.

19. Explain the role(s) of the following in Biotechnology:

(a) Restriction endonuclease

(b) Gel - electrophoresis

(c) Selectable markers in pBR322.

20. Write the steps you would suggest to be undertaken to obtain a foreign-gene-product.

21. Why do lepidopterans die when they feed on Bt cotton plant? Explain how does it happen.

22. 'in-situ' conservation can help endangered/threatened species. Justify the statement.

OR

22. Name and describe any three causes of biodiversity losses.

23. Public all over India is very much concerned about the deteriorating air quality in large parts of North India. Alarmed by this situation the Resident's Welfare Association of your locality organized an awareness programme entitled "Bury not burn". They invited you, being a biology student to participate.

(a) How would you justify your arguments that promote burying and discourage burning? (Give two reasons)

(b) With the help of flow charts, one for each practice depict the chain of events that follow.

Section E

24. Read the following statement and answer the questions that follow:

"A guava fruit has 200 viable seeds."

- (a) What are viable seeds?
- (b) Write the total number of: (i) Pollen grains
(ii) Gametes in producing 200 viable guava seeds.
- (c) Prepare a flow-chart to depict the post-pollination events leading to viable-seed production in a flowering plant.

OR

24. (a) Arrange the following hormones in sequence of their secretion in a pregnant woman.
- (b) Mention their source and the function they perform: hCG; LH; FSH; Relaxin.

25. State and explain the "law of independent assortment" in a typical Mendelian dihybrid cross.

OR

25. (a) How do the observations made during moth collection in pre- and post-industrialized era in England support evolution by Natural Selection?

(b) Explain the phenomenon that is well represented by Darwin's finches other than natural selection.

26. (a) What is an age-pyramid?

(b) Name three representative kinds of age-pyramids for human population and list the characteristics for each one of them.

OR

26. Discuss the role of healthy ecosystem services as a pre-requisite for a wide range of economic, environmental and aesthetic goods and services.

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