

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. 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.

2. Bt-toxins are released as inactive crystals in the bacterial body. What happens to it in the cotton boll worm body that it kills the boll worm?

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

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

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

Section B

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

OR

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

7. Give the binomials of two types of yeast and the commercial bioactive products they help to produce.

8. Differentiate between the genetic codes given below:

- (a) Unambiguous and Universal
 - (b) Degenerate and Initiator
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9. How many cells are present in the pollen grains at the time of their release from anther? Name the cells.

10. Name the group of cells the HIV enters after getting into the human body. What happens in these cells and what are these cells subsequently referred to as? Name the next group of cells the HIV attacks from here.

Section C

11. Rearrange Ramapithecus, Australopithecus and Homo habilis in the order of their evolution on the Earth. Comment on their evolutionary characteristics.

12. (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.

13. 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

13. (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.

14. (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.

15. 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.

16. (a) Trace the development of an endosperm after fertilisation with reference to coconut. Mention the importance of endosperm development.

(b) Write the importance of 'pollen bank'.

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

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

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

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

21. (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?

22. How do kangaroo rats and desert plants adapt themselves to survive in their extreme habitat? Explain.

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?

Section E

24. (a) A pea plant bearing axial flowers is crossed with a pea plant bearing terminal flowers. The cross is carried out to find the genotype of the pea plant bearing axial flowers. Work out the cross to show the conclusions you arrive at.

(b) State the Mendel's law of inheritance that is universally acceptable.

OR

24. (a) Absence of lactose in the culture medium affects the expression of a lac-operon in *E. coli*. Why and how? Explain.

(b) Write any two ways in which the gene expression is regulated in eukaryotes.

25. (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

25. (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.

26. (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

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

(b) Write any two limitations of ecological pyramids.

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