2019 III 11 **1000** **Seat No.** | | | | | |

Time : 2½ Hours

BIOLOGY

Subject Code

H	7	0	4

Total No. of Questions : 28 **(Printed Pages : 4)** **Maximum Marks : 55**

INSTRUCTIONS :

(*i*) *All* questions are compulsory.

(*ii*) Draw diagrams in lead pencil only.

(*iii*) The question paper consists of *four* Sections A, B, C and D.

- Section A has **10** questions of **01** mark each.
- Section B has **11** questions of **02** marks each.
- Section C has **05** questions of **03** marks each.
- Section D has **02** questions of **04** marks each.

(*iv*) The total number of questions is **28**.

(*v*) There is no overall choice, however an internal choice is provided in *one* question of Section B, *one* question of Section C and both questions of Section D.

(*vi*) Multiple choice questions should be attempted only once, if attempted more than once it will not be evaluated. Choose the correct option and rewrite on the answer-sheet.

SECTION – A **(1 mark each)**

1. An example for divergent evolution is _____
   - Wings of butterfly and wings of pigeon
   - Potato and sweet potato
   - Eye of octopus and eye of human
   - Thorn of bougainvillea and tendril of cucurbita

2. The coding strand of DNA is 5' ATCGAT 3'. The mRNA transcribed from this DNA would have the sequence _____
   - 5' AUCGAU 3'
   - 5' TAGCTA 3'
   - 3' AUCGAU 5'
   - 3' TAGCTA 5'

3. In marshy, swampy habitats, there are many green treefrogs which blend well with the green aquatic vegetation as compared to the few grey treefrogs which are easily spotted and eaten by snakes and birds. This is due to _____
   - Biological evolution
   - Natural selection
   - Genetic drift
   - Adaptive radiation
4. A DNA molecule has 200 Adenine and 400 Guanine, therefore the total number of nitrogenous bases in this DNA is _____
   - 600
   - 800
   - 1200
   - 1600
5. If the foreign gene is inserted in the sequence of ampicillin resistant gene instead of tetracycline resistant gene of pBR 322, all the recombinant E.coli would _____
   - Grow in amphicillin medium but not in tetracycline
   - Grow in tetracycline medium but not in ampicillin
   - Grow in both, tetracycline as well as ampicillin medium
   - Not grow in tetracycline as well as ampicillin medium
6. In an experiment five female Turkey birds were kept isolated in a cage without any male Turkey bird to avoid mating. Inspite of this, three more Turkey bird offsprings were born. Give reason.
7. How does the repressor protein bring about switching off of Lac operon ?
8. Define cytokine barrier of innate immunity.
9. Tropics show high biological diversity. Justify the statement with any two hypotheses.
10. Give two features of Homo erectus.

SECTION – B **(02 marks each)**

11. Differentiate between microsporogenesis and Megasporogenesis.

12. Draw a neat diagram of L.S. of a flower.

13. Show a diagrammatic sectional view of seminiferous tubule (enlarged)

14. A woman was surprised to observe in her garden red, pink and white Tulip flower plants as she had planted only pink Tulip plants. With a genetic cross show how such progenies are possible with phenotypes different from the parent plant.

    OR

    Sunita's blood group is B but her husband Sunil does not know his blood group. They have four children with A, B, AB and O blood group respectively. Work out a genetic cross showing genotypes of all along with the phenotype of Sunil.

15. Draw a neat diagram of Watson-Crick model of semiconservative DNA replication.

16. Doctor warned Mrs. Mehra that though her tumour in the stomach was completely removed surgically, there are chances of her developing such tumours in nearby or distant sites in her body. Give scientific explanation for his warning.

17. What are the symptoms of allergic reactions ? Release of which chemicals from mast cells is responsible for this ?

18. What are biofertilisers ? Give the role of any two microbes as biofertilisers.

19. When students visited sewage treatment plant in their city, they observed large airtight tanks with huge pipelines to collect the released gases so as to generate electricity. As a student of Biology explain the formation and composition of these gases in the tanks.

20. Paramoecium aurelia and Paramoecium caudatum were made to grow together in one culture medium with limited food supply. Paramoecium aurelia grew far in number by feeding voraciously and Paramoecium caudatum population totally died within a few weeks. Name and state the Principle to explain this situation.

21. Where does secondary succession take place ? Give three examples of such areas.

SECTION – C **(03 marks each)**

22. Describe the important changes that take place within the human reproductive organs during various phases of menstrual cycle.

23. Sneha wants to delay pregnancy without using any medicines or devices and also with nil side effects. Discuss the contraceptive methods which would make this possible.

24. There is a genetic disorder wherein a simple cut can result in non-stop bleeding. Identify the disorder and explain it with emphasis on its cause and pattern of inheritance.

25. Breeders often bring about mating of unrelated animals to obtain superior progeny. Explain the three methods and their specific benefits.

OR

At ICAR, Goa, the banana crop yield has been reduced tremendously as the plants are affected with a virus. Explain the technique where they can regenerate healthy whole plants in large numbers from parts of these plants in a short duration.

26. Give a detailed account of structure of proInsulin and describe the method of producing mature insulin through rDNA technology.

SECTION – D **(04 marks each)**

27. How are restriction nucleases named and classified ? Explain in detail the mechanism by which these enzymes cut a DNA to give sticky ends.

OR

How was the first recombinant DNA molecule and gene cloning performed by Stanley Cohen and Herbert Boyer using modern biotechnology ? Which two core techniques enabled the birth of this field ?

28. Describe the process of Eutrophication in detail. What role do prime contaminants like nitrates, phosphates and other pollutants play in accelerating this process.

OR

Describe the working of devices that you have studied to control air pollution from exhausts of industries and automobiles.