Subject: Biology
Class: 10+2

Time: 3 Hrs.
M.M: 70

General Instructions:-

(i) All questions are compulsory.

(ii) This question paper consists of four sections A, B, C and D. Section A contains 8 questions of one mark each, Section B is of 10 questions of two marks each, Section C is of 9 questions of three marks each and Section D is of 3 questions of five marks each.

(iii) There is no overall choice. However, an internal choice has been provided in one question of 2 marks, one question of 3 marks and all the three questions of 5 marks weightage. A student has to attempt only one of the alternatives in such question.

(iv) Wherever necessary, the diagram drawn should be neat and properly labeled.

Section A

1. Mention the role of PEG in somatic hybridization for development of new crop plant Pomato.

2. Which end does the tRNA have G and NODOC?

3. Why is germplasm collection of a crop 'desi' and wild species useful in hybridization experiments?

4. A boy had influenza. He got infection due to door handle use by infected students of same class. Mention it type of transmission of pathogen.

5. According to Hardy-Weinberg's principle the allele frequency of a population remains constant. If frequency of dominant allele is 0.6 than give frequency of heterozygous population.

6. What is biodiversity? Name the three important levels of biodiversity.

7. Describe the role of baculoviruses as biocontrol pests.

8. Name the type of flower which lever-mechanism for pollination.

Section-B

9. If you are manager of a dairy farm. What measures would you undertake to improve the quality and quantity of milk production?

10. Why mammary gland of transgenic sheep use as an ideal bioreactor for production of a useful biological products.

11. Number of chromosomes in root cells (or leaf cells or stem cells or somatic cells) is 24, what will be the number of chromosomes in PMC cell and PEC.

OR

This is picture of first test tube baby born July 25 1978.Give name of this first test tube baby and name of first test tube baby of India.

12. Name the pioneer and the climax species in a water body. Mention the changes observed in the biomass and the biodiversity of the successive seral communities developing in the water body.

13. What are bacteriophage vectors ? Name the two phage vectors that are commonly used.

14. In the medium where E. coil was growing, lactose was added, which in induced the lac-operon. But why does lac-operon shut down after sometime after, addition of lactose in the medium?

15. Name and explain the type of barrier of innate immunity, where some cells release interferon when infected.

16. Why is Human Genome Project called a mega project?

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17. Define decomposition and describe the processes and products of decomposition.

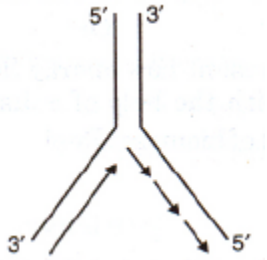
18. A person has been diagnosed to be HIV positive.
    (i) Name the test which the person has undergone.
    (ii) Write the full name of the pathogen involved and describe its structure.
    (iii) Which particular cells of this person are likely to get destroyed?

Section-C

19. Discuss the role of women and communities in protection and conservation of Forests.

20. Discuss briefly the following:
    (a) Greenhouse effect
    (b) Catalytic converter
    (c) Ultraviolet-B.

21. (i) Draw a neat labeled diagram of the longitudinal section of an anatropous ovule.
    (ii) Which cell of the ovule gets transformed into megaspore mother cell?

22. 

Give answers to the following questions

(i) Why does continuous replication occur on the template with 3'-5' polarity? Name the enzyme which helps in the process.
(ii) Why discontinuous replication occurs on the template with 5'-3' polarity? Mention the enzyme which helps in joining the small strands of nucleotides.
(iii) What is replication fork? Explain.

OR

(a) In human genome which one of the chromosomes has the most genes and which one has the fewest?

(b) Scientists have identified about 1.4 million single nucleotide polymorphs in human genome. How is the information of their existence going to help the scientists?

23. What is an age pyramid? What do they show for human population? Represent diagrammatically the different shapes of age pyramids and what shapes each of them represent?

24. (i)Complete the following table.

Crop	Variety	Resistance to diseases
Wheat	**1**	Leaf and stripe rust, hill bunt
Brassica	Pusa swarnim (Karan rai)	**2**
Flat bean	**3**	Jassids, aphids and fruit borer
Okra (Bhindi)	Pusa Sawani Pusa A-4	**4**

(ii) Give two examples in support of Lamarck's theory of evolution .

25. An mRNA strand has a series of codons out of which three are given below:

(i) AUG (ii) UUU (iii) UAG

(a) What will these DNA codons be translated into?

(b) What are the DNA codons that would have transcribed these RNA codons?

26.

(i) Identify the plant. Give botanical name and use of same plant.

(ii) What is typhoid mary? Which test conform the typhoid fever.

(iii) What do you mean by auto immunity.

27. What is biotechnology ? Why has it become important recently ?

Section-D

28. Describe the structure of mature angiospermic pollen grain. Mention one difference between the pollen of dicot and monocot.

OR

What is menstrual cycle? Which hormones regulate menstrual cycle?

29. What essential features must be present in a cloning vector ? Describe the plasmid vector pBR 322.

OR

(a) What are cry proteins ? Name an organism that produce it. How has man exploited this protein t his benefit?

(b) What is gene therapy ? Illustrate using the example of adenosine deaminase (ADA) deficiency.

30. (a) How did Griffith explain the transformation of R strain (non-virulent) bacterial into S strain (virulent)?

(b) Explain how MacLeod, McCarty and Avery determined the biochemical nature of the molecule responsible for transforming R strain bacteria into S strain bacteria.

OR

(a) When a cross is made between tall plant with yellow seeds (TtYy) and tall plant with green seeds (Ttyy), what proportions of phenotype in the offspring could be expected to be (a) tall and green (b) dwarf and green

(b) Briefly mention the contribution of T.H. Morgan in genetics.