

GENERAL INSTRUCTIONS :-

- i) All questions are compulsory.
- ii) This question paper consists of five Sections A, B, C, D and E. Section A contains 5 questions of one mark each, Section B is of 5 questions of two marks each, Section C is of 12 questions of three marks each and Section D has 1 question of 4 marks and Section E 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 three questions of 5 marks weightage. A student has to attempt only one of the alternatives in such questions.
- iv) Wherever necessary, the diagrams drawn should be neat and properly labelled.

**SECTION – A (1x5=5 marks)**

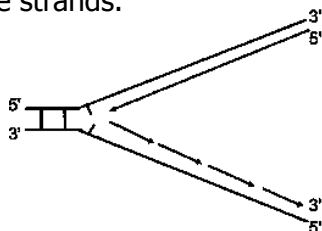
1. The amino acid Serine has 6 m R.N.A codons-UCU UCC UCA UCG AGU AGC. Give the D.N.A. codons for it.
2. Which disorder is caused in humans by the presence of an extra 21<sup>st</sup>autosome?
3. How many cells are found in a typical embryosac? Name them.
4. Name the two types of cloning vectors.
5. Why is thermostable D.N.A. polymerase needed in amplification (Genetic Engineering)?

**SECTION – B (2x5=10 marks)**

6. Draw a labelled diagram of any one of the following :-  
Human Sperm (OR) Male gametophyte of angiosperms.
7. How does a test cross help in identifying the genotype of an organism? Explain.
8. What is the role of lysing enzymes in Biotechnology?
9. How does BOD indicate the level of pollution of water?
10. What is meant by Biotic potential?

**SECTION – C (3x12=36 marks)**

11. a) How do copper and hormone releasing IUD'S act as contraceptives?  
b) What do you mean by seasonal breeders?
12. i) Some organisms like honey bees are called parthenogenic animals. GIVE Reason.  
ii) Zygote forms the major link between one generation and those of the next generation organism- What is the fate of the zygote in organism which show:-  
a) Haplontic life cycle.  
b) Diplontic life cycle.
13. Mention the contribution of S. L. Miller's experiment on "Origin of life".  
(OR)  
State Hardy – Weinberg's principle of genetic equilibrium. Knowing that genetic shift disturb the equilibrium, mention what does this disturbance in genetic equilibrium lead to.
14. Why do you see two different types of replicating strands in the given D.N.A. replication fork?  
Explain and name the strands.



15. In dog, the barking trait (BB) is dominant over the silent trait (bb) and erect ears (EE) are dominant over drooping ears (ee). What is the expected phenotypic ratio of the offspring when dogs, heterozygous for both the traits are crossed?
16. Describe the different types of barriers of innate immunity.

17. Trace the life cycle of malarial parasite in the human body when bitten by an infected female anopheles. (Give diagrams only)
18. Explain in details the process of STP. (SEWAGE TREATMENT PLANT).
19. Mark the statement True OR False-
- Exonucleases remove nucleotides from the ends of the D.N.A.
  - D.N.A. fragments are negatively charged molecules.
  - Microparticles of gold and tungsten coated with D.N.A. are used in a method called microinjection.
  - Enzyme lysozyme is used to break the plant cell.
  - A protein encoding gene expressed in a heterologous host is called a recombinant protein.
  - Plasmids are chromosomal double strand , D.N.A. molecules of plant cells.
20. Represent diagrammatically the E. coli cloning vector  $\beta$  PBR 322.
21. Detrivores like earthworm are involved in the process of decomposition of dead plants and animals. Describe the different steps involved in the process of decomposition.
22. Enlist four harmful effects caused to the humans living in areas having polluted air. Suggest two measures to reduce air pollution.

**SECTION – D (4x1=4 marks)**

23. Jeevan was waiting at a bus stop. Many passengers along with their kids were on their way to school. A bus came and painted the children with black smoke ejected from the exhaust pipe. Jeevan immediately stopped the bus and called the conductor and driver to show what they had done. Passengers waiting in the bus stop supported Jeevan while those on board became restless for being delayed.
- What values did Jeevan promote through his action?
  - Why are children more affected by vehicle exhausts?
  - Cars are seen with Bharat stage IV stickers. What does it imply?
  - How do catalytic convertors reduce vehicular gas emission?

**SECTION - E (5x3=15 marks)**

24. Trace the events that would take place in a flower from the time the pollen grain of the same species falls on the stigma up to the completion of fertilisation.
- OR
- Write briefly the changes in the following organs in the different phases of the menstrual cycle.
    - UTERUS
    - OVARY
  - Draw a detailed diagram to show the changes in hormonal levels, ovarian follicles and in the linings of the uterus.
25. What is meant by the following :- (any five)
- Somatic hybrid
  - Micropropagation
  - Explant
  - Somaclones
  - Tissue culture
  - MOET
  - Apiculture
26. a) How does population change in Biston betularia is a description to natural selection occurrence?
- b) What is genetic drift? How it leads to founder effect and bottleneck effect in populations?

OR

Inheritance patterns of flower colour in garden pea plant and snap dragon differ. Why is the difference observed?

Explain the difference with the help of crosses in their inheritance patterns.