

## BIOLOGY(044)

### General Instruction:

1. There are total of questions and five sections in the question paper. All questions are compulsory
2. Section A contains five questions and each question carries 1 mark
3. Section B contains seven questions and each question carries 2 mark
4. Section C contains nine questions and each question carries 3 marks
5. Section D contains three questions and each question carries 3 marks
6. Section E contains three questions and each question carries 5 marks

### ( SECTION- A)

1. RNA I contains... a) 28S (b) 18S (c) 5.8S (d) all
2. The number of adenylate residues is..... (a) 200-400 (b) 400-500 (c) 100-200 (d) 200-300
3. RNA polymerase binds.... (a) promoter (b) structural gene (c) terminator (d) all
4. DNA replication was semi-conservative by proposed by (a) Watson and Crick (b) Meselson and Stahl (c) both (d) none
5. Bacteriophage lambda has... base pairs... (a) 52,307 (b) 51,409 (c) 50,782 (d) 48,502

### (SECTION-B)

6. What is co-dominance? State one example in human
7. Explain Sex determination in birds and grass hopper
8. Why do the sons of a haemophilic father never suffer from Mendelian disorder
9. Name a disorder, give the karyotype and write the symptoms in case of an additional X chromosome
10. What is the chromosomal basis of Turner's syndrome? Mention the sex any three symptoms
11. What is amino-acylation? And name three nonsense codon
12. What are exons? And define anticodon

(SECTION-C)

13. It is established that RNA is the first genetic material. Explain giving three reasons
14. Explain the role of  $^{35}\text{S}$  and  $^{32}\text{P}$  in the experiments conducted by Hershey and Chase experiment
15. State the dual role of deoxyribonucleoside triphosphate during DNA replication
16. Describe the process of transcription in bacteria.
17. Mention the role of ribosomes in peptide bond formation. How does ATP facilitate it?
18. How are the structural genes activated in the lac operon in *E. coli*? Explain
19. What is amplification with reference to DNA fingerprinting?
20. Differentiate between VNTR and Probe
21. Write the full form of SNPs, BAC, and YAC

(SECTION-D)

22. What would happen if histones were to be mutated and made rich in amino acids aspartic acid and glutamic acid in place of basic amino acids such as lysine and arginine
23. In a nucleus, the number of RNA nucleoside triphosphates is 10 times more than the number of DNA nucleoside triphosphates, still only DNA nucleotides are added during the DNA replication and not the RNA nucleotides. Why
24. A single base mutation in a gene may not always result in loss or gain of function. Do you think the statement is correct? Define your answer.

(SECTION-E)

25. What is semiconservative replication of DNA? Explain how it was experimentally proved
26. Explain the steps involved in a polypeptide synthesis. How are the amino acids activated during polypeptide synthesis
27. What is operon? Who first proposed this concept? Describe the major steps involved in lac operon