



- c) What is the significance of the  $T_m$  (melting temperature) of DNA? (3)
- Q-4                    Attempt all questions                    (14)**
- a) Distinguish between: (7)
- i) Operator and Promoter
  - ii) Leading strand and Lagging strand
  - iii) Intron and Exon
- b) Briefly explain different steps in prokaryotic and eukaryotic transcription? (4)
- c) Give three structural features of the B-form of the DNA double helix (3)
- Q-5                    Attempt all questions                    (14)**
- a) What does it mean that replication is semi-conservative? Explain. (7)
- b) A certain mRNA codon is determined to be AUG. (4)
- i) What is the anticodon in the tRNA?
  - ii) What sequence of DNA is responsible for the mRNA codon?
  - iii) AUG codon codes for which amino acid?
- c) What is meant by repression and derepression of gene expression? Give examples in support of your answer (3)
- Q-6                    Attempt all questions                    (14)**
- a) Describe the series of events that occur in a bacterial cell following the addition of lactose (7)
- b) What is mRNA splicing? Explain its mechanism in detail with the help of a diagram (4)
- c) Compare and contrast the structure of B-DNA with that of Z-DNA. (3)
- Q-7                    Attempt all questions                    (14)**
- a) Write a note on Organelle DNA (7)
- b) Briefly describe initiation and termination of protein synthesis in prokarotes (4)
- c) What is RNA interference? Explain its role in gene expression. (3)
- Q-8                    Attempt all questions                    (14)**
- a) Give a brief account of mechanism of action of Telomerase and explain the importance of telomerase in human biology (7)
- b) Outline the causes of DNA damage and give a brief account of DNA repair system. (4)
- c) What is genetic code? Discuss the characteristics of genetic code (3)

