

2062

B.E. (Biotechnology) Fourth Semester

BIO-411: Molecular Biology

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section.

x-x-x

1. Write briefly:-

- a) What is processivity of DNA polymerase? Which polymerase in E. coli has best processivity?
- b) Why t-RNA is known as adapter molecule?
- c) How can you separate proteins of same molecular weight by electrophoresis?
- d) Give example of second messengers.
- e) What is degeneracy of code?
- f) What is the importance of Taq DNA polymerase over E. coli DNA polymerase in PCR reaction?
- g) Compare between Group 1 and 2 introns.
- h) What is activation of amino acid in protein synthesis?
- i) How centromere is different from telomere?
- j) What is the importance of DNA pol 1 in nick translation?

(10 x 1)

Section-A

2. a) What are the similarities and dissimilarities between replication and transcription process?
- b) What is the importance of SOS repair pathway? Explain with diagram.
- c) Origin of replication has consensus sequence. Justify the statement.

(3, 4, 3)

3. a) How nuclear splicing occur inside the cell? Explain with proper diagram.
- b) Other than splicing, what are the other post synthetic processing mechanisms of RNA? Explain with diagram.

(5, 5)

4. a) What is the mechanism of rho-dependent and independent termination? Give specific example of prokaryotic and eukaryotic transcription inhibitor.
- b) There are 4 nucleotides in RNA and 3 nucleotides per codon and total 64 codons. However, these 64 codons only code for 20 amino acids and 32 tRNAs are needed to recognize codons in mRNA. Why is it so?

(5, 5)

P.T.O.

(2)

Section-B

5. a) What are the steps of protein biosynthesis? Explain with diagram.
b) Proteins are synthesized as large, inactive one and then they are trimmed to the final one. What is the phenomenon? Where it occurs? What is the importance of this phenomenon? Give some examples of this phenomenon. (5, 5)
6. a) What are the similarities and dissimilarities of lactose and galactose operon?
b) Write short notes on, i) Peptidyl transferase, ii) Native gel and denaturing gel (6, 2, 2)
7. a) What is the importance of PCR as a important molecular technique with respect to Covid19 pandemic? Explain detail mode of action with proper diagram.
b) Explain importance of si-RNA technology in therapeutics. (5, 5)

x-x-x