

2054

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 operon?
- b) Which amino acids have single codon?
- c) Explain fidelity of replication.
- d) What are second messengers?
- e) What are IS elements in transposons?
- f) What are coding strand and non coding strand?
- g) What are the specific uses of alpha and sigma subunit of RNA polymerase?
- h) What are exonuclease, endonuclease and excinuclease?
- i) What is quorum sensing in bacteria?
- j) What are the pH of stacking and running gel and why?

(10x1)

**Section-A**

2. a) Compare between DNA polymerase I, II and III structurally and functionally.  
b) How does termination reaction of replication and transcription differ?  
c) What is direct repair system? Explain with example. (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) Compare between replication fork and transcription bubble. Give specific example of prokaryotic transcription and translational inhibitor.  
b) Explain Wobble hypothesis in detail mentioning need of 32 tRNAs to recognize codons of 20 amino acids. (5,5)

P.T.O.

(2)

**Section-B**

5. a) What are the steps of initiation, elongation and termination reaction in protein biosynthesis?  
Explain with diagram.
- b) How does the newly synthesized polypeptide chain undergoes post translational modifications? (5,5)
6. a) How does lactose operon is positively and negatively regulated?
- b) Write short notes on, i) E, P and A site in ribosome, ii) Native gel and denaturing gel (5, 2.5, 2.5)
7. a) Explain detail mode of action of PCR reaction with proper diagram. What are the applications of this molecular technique?
- b) Explain importance of si-RNA technology in therapeutics. (5, 5)

x-x-x