Exam. Code: 0908
Sub. Code: 33362

2055

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. I which is compulsory and selecting two questions from each Unit.*

x-x-x

1. Write briefly:

a) What is gratuitous inducer? Give example.

b) Which amino acids have single codon?

c) Explain fidelity of replication.

d) What are important functions of m-RNA, r-RNA and t-RNA?

e) What are IS elements in transposons?

f) Give example how signal is amplified by second messengers.

g) Which subunits of RNA polymerases are important for promoter assembly and specificity?

h) How does poly A-tail is added in transcript?

i) What is quorum sensing in bacteria?

j) Why SDS-PAGE is known as discontinuous and denaturing gel? *(10×1)*

UNIT - I

2. a) Replication of DNA in *E. coli* occurs in three stages. Discuss in detail with diagram.

b) How does termination reaction of replication and transcription differ?

c) Mismatch repair system is very important for correcting rare mismatches. How does it work?

(5,2,3)

3. a) Nuclear splicing is a transesterification reaction occurs via spliceosome complex. Describe in detail with diagram.

b) How does a 5' cap is added to m-RNA?

(5,5)

P.T.O.

4. a) Write short notes on:-

i) Aminoacyl t-RNA synthetase

ii) Nick-translation.

b) Explain Wobble hypothesis in detail mentioning need of *32 tRNAs* to recognize codons of 20 amino acids. *(2.5,2.5, 5)*

UNIT - II

5. a) What are E, A and P site in ribosome? How do they contribute during protein synthesis?

b) How does the newly synthesized polypeptide chain undergo post translational modifications? *(5, 5)*

6. a) What is operon? Explain lac operon in detail with diagram.

b) Write short notes on:-

i) Receptors in cell signaling

ii) si-RNA technology *(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) How molecular biology is utilized in therapeutics? Explain with examples. *(5, 5)*

x-x-x