[This question paper contains 2 printed pages.]

Sr. No. of Question Paper : 2387 **F–4** **Your Roll No.....**

Unique Paper Code : 2531402

Name of the Course : **B.Sc. (Hons.) Microbiology**

Name of the Paper : Molecular Biology

Semester : IV

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions in all.
3. **All** questions carry equal marks.

1. (a) Define the following (any **six**) :

Exon shuffling, Central Dogma, Alternative splicing, Processivity, Split genes, Spliceosome, Replisome (1×6=6)

(b) If a DNA sample has 40% G content, give the percentage of other three bases. (2)

(c) Give the sequence of sense and anti-sense DNA strand, if the sequence of RNA transcribed from it is as follows :

5'-AUCGUUCAGAUC-3'. (3)

(d) Write the contribution of the following scientists :

(i) John Cairns

(ii) Arthur Kornberg

(iii) Meselson and Stahl

(iv) Rosalind Franklin (1×4=4)

P.T.O.

2. Write short notes on any **three** of the following :

   (a) θ-Mode of replication

   (b) Prokaryotic promoters

   (c) Mismatch repair

   (d) Semi-conservative mode of replication (5×3=15)

3. (a) Describe RNA polymerases involved in eukaryotic transcription. (6)

   (b) Explain the role of DNA methylation in eukaryotic gene expression. (4)

   (c) Write about the initiation of translation in prokaryotes. (5)

4. (a) Differentiate between the following :

      (i) DNA Pol-I and III

      (ii) si and mi-RNA

      (iii) Inducible and repressible operon

      (iv) A-and B-DNA (3×4=12)

   (b) Elaborate the significance of telomerase in replicating the linear ends of chromosomes. (3)

5. (a) Discuss the process and significance of polyadenylation of mRNA. (5)

   (b) Describe attenuation with respect to trp operon. (6)

   (c) Write a short note on yeast mating types. (4)

6. (a) Give examples of any two prokaryotic protein synthesis inhibitors with their mode of action. (4)

   (b) Discuss initiation of transcription in prokaryotes. (5)

   (c) Elaborate splicing mechanism of pre-mRNA. (6)