**ST JOSEPH’S UNIVERSITY, BENGALURU - 27**

Registration Number:

Date & Session:

**M.Sc. MICROBIOLOGY – 2nd SEMESTER**

**SEMESTER EXAMINATION: APRIL 2024**

**(Examination conducted in May /June 2024)**

**MB 8321: MOLECULAR BIOLOGY**

**(For current batch students only)**

**Time: 2 Hours Max. Marks: 50**

**This paper contains 2 printed pages and four parts**

**I. Answer any Five of the following 5x3=15**

1. Name the types of DNA polymerases involved in eukaryotic DNA replication.
2. Name the subunits of prokaryotic RNA polymerase. What gives RNA polymerase its specificity towards promotor region?
3. What are the inhibitors of transcription termination? What significance does inhibitor provides?
4. What is Shine Dalgarno sequence?
5. Describe Ssr A mediated translational regulation.
6. What is catabolite repression?
7. With examples write the role of regulatory proteins in gene expression.

**II. Answer any Two of the following 2x5=10**

1. Compare and contrast Rho dependent versus Rho independent transcription termination in prokaryotes?
2. What is the function of aminoacyl-tRNA synthetases? Write a note on proof reading activity carried out by aminoacyl-tRNA synthetases.
3. What is RNA editing? What are its applications? How is it carried out?

**III. Answer any Two of the following 2x10=20**

1. a. Draw a neat labelled diagram of tRNA. What is codon degeneracy? 5 m
2. Describe translation elongation in prokaryotes. 5 m
3. How are proteins in a cell sorted and lead to its destination? Describe it with the help of a neat diagram.
4. a. Describe the structure of tryptophan operon. 5 m

b. What is epigenetic regulation? Describe any one molecular mechanism that mediate epigenetic phenomena. 5 m

**IV. Answer the following 1x5=5**

1. A gene coding for a protein was over expressed due to mutations in the gene. This mutation in the gene led to a diseased condition in the animal. With the knowledge and the skills acquired how will you identify the root cause of the problem? What strategy will you adopt to regulate the gene to regain normalcy?