# UG 3rd Semester Examination - 2024 (Under NCCF)

**Award : BSc**
**Discipline : Microbiology**
**Course Type : MNC-3 (Minor)**
**Course Code : BSCHMCBMN301**
**Course Name : Fundamentals of Molecular Biology**
**Full Marks : 35 (Regular)** **Time: 2 Hours**

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**1. Answer any five questions.** **1×5=5**

(a) What is a polycistronic mRNA?
(b) Write the function of gyrase in DNA replication.
(c) What is meant by the antiparallel nature of the DNA strand?
(d) What are stop codons?
(e) What is the role of metal ions in DNA replication?
(f) What is the function of the SSB protein in DNA replication?
(g) What is the function of TATA box?
(h) What do you mean by Okazaki fragment?

**2. Answer any five questions.** **2×5=10**

(a) Distinguish between leading and lagging strands.
(b) What is central dogma?
(c) What do you mean by DNA methylation mechanism?
(d) Write the difference between purine and pyrimidine.
(e) Mention two factors involved in the termination of translation.
(f) Differentiate primary and secondary structure of DNA.
(g) The gene sequence of OriC is AT-rich. Why?
(h) Define genetic code.

**3. Answer any two questions for students appearing for their regular courses.** **5×2=10**

(a) What is an operon? Explain *lac* operon with a suitable diagram and its regulation in *E. coli*. 1+2+2
(b) Describe an experiment that proves that DNA replication is semi-conservative in nature.
(c) Define telomere. Describe the role of telomere in the replication. 1+4
(d) Why does DNA polymerase work only in a 5′ to 3′ direction?

**4. Answer any one question.** **10×1=10**

(a) Describe the rolling circle model of replication with a suitable diagram. Distinguish between B-DNA and Z-DNA. 5+2+3
(b) Describe the prokaryotic translation initiation. Briefly describe the significance of Rho-dependent and Rho-independent termination. 5+5

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