

U.G. 4th Semester Examination - 2021**Molecular Biology and Biotechnology****[HONOURS]****Course Code : MBBT-H-401-T-CCR-8****(Molecular Biology)**

Full Marks : 20

Time : 1 Hour

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any **five** of the following: $1 \times 5 = 5$
- What is Ac-Ds element in *Maize*?
 - Name one antibiotic which inhibits translation. State its mode of action.
 - How modified guanine base is added to mRNA?
 - State the primary difference between a repressible operon and an inducible operon.
 - What is end-replication problem?
 - What are the components of primosome?
 - Name two molecules that can inhibit bacterial DNA replication.
 - What is the role of β -clamp?

[Turn Over]

2. Answer any **one** of the following: $5 \times 1 = 5$
- Why is uracil not tolerated in DNA? In the event of spontaneous deamination of cytosine to uracil in *E. coli* genome, which repair pathway is most likely to mend the error? Describe. $1+1+3=5$
 - How tRNAs become “charged” during translation? What is the energy cost in formation of a peptide bond during translation? $3+2=5$
 - What is sigma factor? Briefly describe structure of bacterial RNA polymerase. State two differences between prokaryotic and eukaryotic RNA polymerase. $1+2+2=5$
3. Answer any **one** question: $10 \times 1 = 10$
- Describe with an example how a bacterial transposon can migrate. What is P element? Mention the name and importance of major RNA processing events found in eukaryotes. Why only 32 tRNAs are required to translate all 61 codons? $3+2+3+2=10$
 - State the salient features of bacterial promoters. What is “abortive initiation”? How does intrinsic termination of a growing RNA strand

occur in bacteria? Describe how eukaryotic transcription and RNA processing is coordinated? What is enhancer sequence?

$$2+1+3+3+1=10$$

- c) During bidirectional DNA replication, Okazaki fragments are generated against both the parental strands – True or False? Explain. What is the meaning of processivity of a polymerase? *E. coli* DNA pol I has 3 different enzymatic activities—What are they?

$$5+2+3=10$$
