G-2/235/21 Roll No. ....

M.Sc. II Semester Examination, 2021
MICROBIOLOGY
Paper I
(Molecular Biology)

Time : 3 Hours] [Max. Marks : 80

Note : *All questions are compulsory. Question Paper comprises of 3 sections. Section A is objective type/multiple choice questions with no internal choice. Section B is short answer type with internal choice. Section C is long answer type with internal choice.*

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SECTION A **1 × 8 = 8**

(Objective Type Questions)

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Choose the correct answer :

1. Which is a property of RNA primers in an E.coli replication fork ?

    (a) RNA primers are synthesized using a DNA template and NDPs.

    (b) Each RNA primer is joined to an Okazaki piece through a non-covalent bond.

    (c) Each RNA primer is both polymerized and degraded in the 5′ → 3′ direction. P.T.O.

    (d) RNA primers are synthesized and proof read by primase enzyme

2. Which protein can break covalent bonds ?

    (a) Helicase   (b) Primase

    (c) SSB   (d) DNA Gyrase

3. Which is a characteristics of mRNA in E. coli ?

    (a) *m*RNA will be polycistronic and double stranded

    (b) *m*RNA will be monocistronic and single-stranded

    (c) *m*RNA will be contain one or more non-coding spacer sequences

    (d) *m*RNA will contain one or more coding leader sequences

4. Which property is found in eukaryotic RNA ?

    (a) Before processing, *t*RNAs contains unusual bases

    (b) Before processing, *r*RNAs contains 3′–leader sequences

    (c) Before processing, pre-RNAs contain spaces

    (d) Before processing, hn RNAs contain introns.

5. Which position of a codon is said to Wobble ?

    (a) First   (b) Second

    (c) Third   (d) Fourth

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6. Wobble Hypothesis was first proposed by ....

(a) Nirenberg   (b) Watson and Crick

(c) Watson   (d) Crick

7. In prokaryotes, AUG encodes :

(a) Methionine   (b) N-formyl methionine

(c) A stop codon   (d) Alanine

8. Negative regulation of protein synthesis is accomplished by :

(a) Allosteric inhibition

(b) The binding of RNA polymerase to the promoter

(c) The binding of a repressor to the DNA

(d) The binding of a repressor to the RNA polymerase

SECTION B   4 × 6 = 24

(Short Answer Type Questions)

Note : *Answer with word limit 250 words.*

Unit-I

1. Write a note on DNA polymerase, its types and properties.

Or

Write the topological properties of DNA.

Unit-II

2. Write a note on RNA synthesis inhibitors.

Or

Write the difference between Polycistronic and Monocistronic RNAs.

Unit-III

3. What is Wobble Hypothesis ?

Or

Write the Initiation process of Translation.

Unit-IV

4. Explain the concept of operon.

Or

Describe the regulation by Attenuation.

Section C

Note : *Answer with word limit 500 words.*

Unit-I

1. Describe DNA Replication of prokaryotes with suitable diagrams.

Or

Write the relationship between replication and cell cycle inhibitors of DNA replication.

Unit-II

2. Describe the basic steps of transcription in prokaryotes with suitable diagrams.

Or

Write a note on catalytic RNA.

Unit-III

3. Describe the basic features of Genetic code.

Or

Describe translation process in protein synthesis.

Unit-IV

4. Write the difference between positive and negative regulation with suitable examples.

Or

Explain catabolite repression with suitable diagram.

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