



DCU-003-1131003

Seat No. _____

M. Sc. (Biotechnology) (Sem. I) (CBCS) Examination

August - 2022

BT-103 : Molecular Biology

(New Course)

Faculty Code : 003

Subject Code : 1131003

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

Instructions :

- (1) Figures at right side indicates marks of the question.
- (2) Attempt any five.

1 Answer the Questions : (2 mark each)

- (1) Robertsonian mutation involves
 - (a) Joining of 2 same short arms
 - (b) Joining of 2 same long arms
 - (c) Joining of 2 different short arms
 - (d) Joining of 2 different long arms
- (2) How long is the okazaki fragment in E.coli DNA replication ?
 - (a) 100 Nucleotides
 - (b) 500 Nucleotides
 - (c) 1000 Nucleotides
 - (d) 200 Nucleotides
- (3) The nick Translation property is present in
 - (a) DNA POL I
 - (b) DNA POL II
 - (c) DNA POL III
 - (d) Both I and II
- (4) Prader-Willi Syndrome is an example of
 - (a) Deletion
 - (b) Inversion
 - (c) Aneuploidy
 - (d) Translocation
- (5) During transcription, if the nucleotide sequence of the DNA strand that is being coded is ATACG, then the nucleotide sequence in the mRNA would be
 - (a) TCTGG
 - (b) UAUGC
 - (c) UATGC
 - (d) TATGC

- (6) Which one of the following pairs is correctly matched with regard to the codon and the amino acid coded by it?
- (a) UUA-Valine (b) AAA-Lysine
(c) AUG-Cysteine (d) CCC-Alanine
- (7) The DNA is digested with bacterial enzyme micrococcal nuclease. After digestion the nucleotide chain obtain will be of
- (a) 128 bp (b) 146 bp
(c) 56 bp (d) 200 bp

2 Answer the following : (two marks each)

- (1) Which enzyme can be described as a DNA-dependent RNA polymerase?
- (2) An organism has a G + C content of 64% in its DNA. What are the percentages of A, T, G, and C?
- (3) How nucleosides differ from Nucleotides?
- (4) What are okazaki fragments?
- (5) Which is the first mRNA codon to mostly specify an amino acid?
- (6) Which enzyme synthesizes t-RNA?
- (7) Name the enzyme which acts as eukaryotic reverse transcriptase.

3 Answer the following : (7 marks each)

- (a) Define Multi gene Family. Explain with examples.
- (b) Explain the mechanism of prokaryotic and Eukaryotic Translation.

4 Answer the following : (7 marks each)

- (a) Define DNA binding domain. Explain with the examples.
- (b) Telomerase solves the end replication problem. What is the problem and how it solves?

- 5** Answer the following : (7 marks each)
- (a) Define splicing. Explain it in detail.
 - (b) Explain the role of t RNA and amino acyl tRNA Synthetase in peptide synthesis.
- 6** Answer the following : (7 marks each)
- (a) Explain one Histones modification which promotes gene expression and one which inhibits it.
 - (b) Give a detail account an DNA repair.
- 7** Answer the following : (7 marks each)
- (a) What do you understand about the regulation of gene expression by environment factors. Explain?
 - (b) Give a detail account of Prokaryotic RNA polymerase.
- 8** Answer the following : (7 marks each)
- (a) Explain the initiation step for the synthesis of pre mRNA.
 - (b) Define Operon . Give a detail account of tryptophan operon.
- 9** Answer the following : (7 marks each)
- (a) Write a note on Post translational modifications
 - (b) Explain the genome organization of Prokaryotes.
- 10** Answer the following : (7 marks each)
- (a) Define DNA binding domain. Explain with the examples.
 - (b) Give the detail account of Giant Chromosomes.
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