

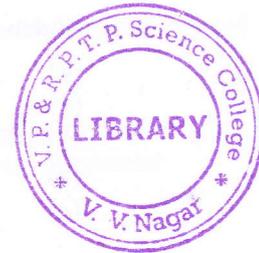
SEAT No. _____



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[122/A-23]

SARDAR PATEL UNIVERSITY
T.Y.B.Sc EXAMINATION - SEMESTER-V
MICROBIOLOGY
US05CMIC21(Molecular Genetics)



Date: 23/11/2021
Day: Tuesday

Time: 3:00 PM to 5:00 PM
Total marks: 70

N.B: Figures on the right indicate marks.

Q.1

Multiple Choice Questions.

10

- 1 Which of the following enzymes separates the two strands of DNA during replication?
(a) Gyrase (b) Topoisomerase
(c) Helicase (d) DNA polymerase
- 2 DNA replication is
(a) conservative (b) conservative and discontinuous
(c) semi-conservative and (d) semi-conservative and semi-discontinuous
discontinuous
- 3 What constitutes Primosome?
(a) Dna a, Dna b, Dna c, Dna G (b) Dna b, Dna G
(c) Dna c, Dna b (d) Dna a, Dna c
- 4 Which of the following RNA constitutes 90 percent of the total cellular RNA?
(a) rRNA (b) tRNA
(c) mRNA (d) Hn RNA
- 5 The following code codes for which of the amino acid respectively?
AUG and GUG
(a) Phenylalanine, tyrosine (b) **Methionine, Valine**
(c) Methionine, alanine (d) Lysine, valine
- 6 A sample of normal double-stranded DNA was found to have a thymine content of 27%. What is the expected proportion of guanine ?
(a) 09% (b) 23%
(c) 32% (d) 36%
- 7 Name the type of mutation in which the cause of mutation is not known?
(a) Spontaneous mutation (b) Suppressor mutation
(c) Nonsense mutation (d) Mis-sense mutation

- 8 Which of the following chemical mutagen affects only replicating DNA?
 (a) Acridine dye (b) Alkylating agent
 (c) Deaminating agent (d) Base analog
- 9 Which of these systems give the best mode for turning trp operon off?
 (a) Repressor (b) Attenuator
 (c) Repressor with a downstream poly A tail (d) Repressor with an attenuator
- 10 What is the correct definition for excision repair?
 (a) Repair of a single damaged nucleotide (b) Repair of a damaged oligonucleotide
 (c) Removal of a single damaged nucleotide (d) Removal of a damaged oligonucleotide

Q.2 A State whether the given statements are true or false. 02

- 1 High glucose prevents formation of the CAP-cAMP complex.
- 2 Topoisomerase is a reverse transcriptase that maintains chromosome ends.

B Fill in the blanks with appropriate answer. 06

- 1 A cell's _____ remains constant whereas its phenotype changes in response to environmental influences.
- 2 Unidirectional replication of a circular DNA molecule like a plasmid that involves nicking one DNA strand and displacing it while synthesizing a new strand is called _____.
- 3 The third position within a codon, in which changes often result in the incorporation of the same amino acid into the growing polypeptide, is called the _____.
- 4 The enzyme that adds an amino acid to a tRNA molecule is called _____.
- 5 A chemical mutagen that is structurally similar to a nucleotide but has different base-pairing rules is called a _____.
- 6 The DNA sequence, to which repressors may bind, that lies between the promoter and the first structural gene is called the _____.

Q.3 Give SHORT answers to the following questions. (Attempt Any ten) 20

- 1 Briefly write about B form of DNA
- 2 Draw labelled diagram of all nucleotides of DNA
- 3 Why is primase required for DNA replication?
- 4 What is the role of single-stranded binding protein in DNA replication?
- 5 Why does translation terminate when the ribosome reaches a stop codon? What happens?
- 6 Write briefly about DNA dependent RNA polymerase.
- 7 What is meant by the genetic code being nearly universal?
- 8 Explain central dogma.



- 9 Why is it more likely that insertions or deletions will be more detrimental to a cell than point mutations?
- 10 How U.V.Rays act as mutagenic agents
- 11 What are two ways that bacteria can influence the transcription of multiple different operons simultaneously in response to a particular environmental condition?
- 12 Write in short about Conditional mutation.

Q.4

Answer the following LONG Question:- (Attempt any four)

32

- 1 .Explain in detail that DNA replication is semiconservative by citing experiment.
- 2 Describe the process of DNA replication and the functions of the enzymes involved
- 3 Write a detailed note on mechanism of Transcription.
- 4 Discuss Lactose operon in detail.
- 5 Schematically explain the process of Translation and discuss protein folding in detail.
- 6 Structure and role of Transfer RNA.
- 7 Discuss in detail any four types of mutations.
- 8 SOS repair mechanism.

— X —

