



Seat No. _____

Number of printed pages: 02

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SARDAR PATEL UNIVERSITY
B.Sc. Examination Semester-5, October-2025
Subject: Microbiology Subject Code: US05CMIC51
Subject Title: Bacterial Genetics

Date: 04/10/2025

Time :10:00 AM to 01:00 PM

Day: Saturday

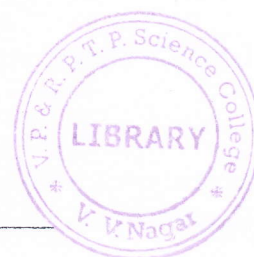
Total Marks: 70

N.B: Figure on the right indicate marks

Q.1 Multiple Choice Question.

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- [1] _____ bonds link 3' carbon of deoxyribose to 5' phosphate of the next sugar.
[a] Vander waal [b] hydrogen [c] peptide [d] phospho diester
- [2] The B – form of DNA has _____ base pairs per turn of helix.
[a] 11 [b] 10 [c] 9 [d] 8
- [3] _____ are responsible for separating the DNA strands just ahead of the replication fork.
[a] helicases [b] DNA gyrases [c] DNA polymerases [d] ligases
- [4] The sigma factor is component of _____.
[a] DNA polymerase [b] ssb protein [c] ligase [d] RNA polymerase
- [5] The RNA viruses that contain reverse transcriptase are known as _____.
[a] hetroviruses [b] retroviruses [c] reverse viruses [d] transcripto viruses
- [6] Lactose operon of *E.coli* consist of _____ structural genes.
[a] 3 [b] 4 [c] 5 [d] 6
- [7] _____ is a start codon.
[a] UAA [b] UAG [c] AUG [d] UGA
- [8] When a purine is replaced by purine, the type of mutation is known as _____.
[a] Transition [b] Transversion [c] Transformation [d] Apurination
- [9] _____ is a nitrogen base analogue.
[a] Nitrous acid [b] Alkylating agents [c] 5 BU [d] EMS
- [10] _____ is based on mutational reversion assay.
[a] Replica plate method [b] Fluctuation test [c] Ames test [d] Gradient plate method



Q.2 Answer the following questions briefly. [Attempt any 10]

20

- [1] Draw the structures of adenine and thymine.
- [2] What is end replication problem ?
- [3] Differentiate between A form and B form of the DNA.
- [4] What is Teminism?
- [5] What is factor-independent termination of transcription ?
- [6] Define catabolite repression.
- [7] Define genetic code.
- [8] What are molecular chaperones.
- [9] What is Shine-Dalgarno sequence ?
- [10] Define nonsense mutation.
- [11] Define mutagenic agents.
- [12] What is mismatch repair ?



Q.3 Describe in detail DNA replication in bacteria.

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OR

Q.3 Explain briefly DNA as genetic material.

10

Q.4 Explain stages of gene transcription process.

10

OR

Q.4

[a] Explain negative transcriptional control of tryptophan operon.

05

[b] Explain structure and gene products of an integrated retroviral genome.

05

Q.5

[a] Explain structure and role of prokaryotic ribosome.

05

[b] Describe structure and function of t-RNA in protein synthesis.

05

OR

Q.5

[a] Describe post translational chemical modification of protein.

06

[b] Write note on : The Wobble hypothesis.

04

Q.6 Describe in detail replica plating technique to prove spontaneous mutation.

10

OR

Q.6

[a] Enlist types of chemical mutagens. Describe mechanism of mutation of any one.

06

[b] Write a note on : Excision repair system.

04

— X —

(2)