

SEAT No. \_\_\_\_\_



No. of Printed Pages: 2

[21]

SARDAR PATEL UNIVERSITY  
B.Sc Microbiology  
USO6CMIC01  
Molecular Genetics

Date: 23/6/2022 Thursday  
Time: 10:00 to 12:00 PM

Total Marks : 70

Que: 1) Attempt the following multiple choice questions. (10)

- 1) 2-Amino purine is \_\_\_\_\_.
  - a) Alkylating agent
  - b) Base analogue
  - c) Deaminating agent
  - d) Intercalating agent
- 2) Ethyl methane sulphonate is \_\_\_\_\_.
  - a) Alkylating agent
  - b) Base analogue
  - c) Deaminating agent
  - d) Intercalating agent
- 3) Replica plate method can be used for isolation of \_\_\_\_\_.
  - a) Antibiotic resistant mutant
  - b) Bacteriophage resistant mutant
  - c) Auxotrophic mutant
  - d) All of these
- 4) Mismatch repair of damaged DNA involves \_\_\_\_\_.
  - a) UVrA
  - b) MutS
  - c) LexA
  - d) RecA
- 5) This is a repressor of SOS repair of damaged DNA.
  - a) UVrA
  - b) MutS
  - c) LexA
  - d) RecA
- 6) Which of the following cannot carry out transformation?
  - a) *Bacillus subtilis*
  - b) *Neisseria gonorrhoea*
  - c) *Haemophilus influenzae*
  - d) *Penicillium notatum*
- 7) Transfer of DNA fragment from donor to recipient bacteria by virus is referred to as \_\_\_\_\_.
  - a) P1 phage
  - b) P22
  - c)  $\lambda$
  - d) T2
- 8) \_\_\_\_\_ phage integrates between bio and gal genes in *E. coli* chromosome.
  - a) Plasmid
  - b) Insertion sequences
  - c) Transposon
  - d) Target sequences
- 9) Curing refers to as the removal of \_\_\_\_\_.
  - a) F<sup>+</sup>
  - b) Hfr
  - c) F'
  - d) F<sup>stf</sup>
- 10) Interrupted mating experiment utilizes \_\_\_\_\_ strain.

Que: 2A) Fill in the blank. (04)

- 1) The process of transfer of genes between bacterial cells that are in physical contact is known as \_\_\_\_\_.
- 2) Mutation in which purine is substituted by a purine is called \_\_\_\_\_.
- 3) \_\_\_\_\_ discovered Transposable elements.
- 4) Carcinogenicity of a chemical can be tested by \_\_\_\_\_ test.

Que: 2 B) State whether the following statement is true or false. (04)

- 1) Mutation in prokaryotic DNA leading to a change from AAA to UAA in RNA is called silent mutation.
- 2) Ames' test uses histidine auxotrophic strain of *Streptococcus pneumoniae*.
- 3) A segment of DNA having one or more genes in the center and the two ends carrying inverted repeats of nucleotide sequence is called Transposon.
- 4) Ellie Wollman demonstrated the interrupted mating experiment.

Que:3) Answer any ten questions in short.

(20)

- 1) Write the contributions of Joshua Lederberg .
- 2) Define: i) Missense mutation  
ii) Silent mutation
- 3) Differentiate between Spontaneous and induced mutation.
- 4) Write the mechanism of photoreactivation.
- 5) Differentiate between Homologous and Non- Homologous recombination.
- 6) Write the role of RecA protein.
- 7) Define i) Auxotrophic mutant  
ii) competence
- 8) Draw the structure of Tn3.
- 9) How was the process of transformation discovered?
- 10) Why are microbes used to study genetics?
- 11) How was bacterial conjugation discovered?
- 12) What is the application of an Hfr strain?

Que: 4) Answer any four questions in detail.

(32)

- 1) Write a note on Fluctuation test.
- 2) Discuss the mode of action of Nitrous acid and U.V radiation on DNA.
- 3) Describe Excision repair System of damaged DNA.
- 4) Discuss Ames's test and its significance.
- 5) Describe the mechanism of genetic transformation in *Streptococcus pneumoniae*.
- 6) Describe the process of generalized transduction citing a suitable example.
- 7) Explain the process of mating pair formation during conjugation in bacteria.
- 8) Discuss various types of bacterial plasmids.

— X —