

SEAT NO. _____



No of printed pages: 02

[21/A-19]

SARDAR PATEL UNIVERSITY
B.Sc 6TH SEMESTER EXAMINATION
SUBJECT: MICROBIOLOGY US06CMIC01

Date: 29/09/22

MOLECULAR GENETICS

Total Marks: 70

Time: 3:30 to 5:30 pm

Q-1 Attempt Multiple Choice Questions: Choose the Most Appropriate One. (10)

1. Which of the following is a nitrogen base analogue?
a) Nitrous acid b) EMS
c) 2, amino purine d) none of these
2. Which of the following is a physical mutagen?
a) 2- amino purine b) Nitrous acid
c) U.V. rays d) 5- bromo uracil
3. Replica plate technique can be used for.....
a) Proving spontaneous nature of mutations b) Isolation of auxotrophic mutants
c) Isolation of drug resistance mutants d) All of these
4. Enzyme photolyase is responsible for-----
a) Reverse transcription b) Photoreactivation
c) RNA replication d) RNA polymerisation
5. Ruv C is responsible for -----,
a) Holiday junction cleavage b) Photo reactivation
c) Replication d) None of these
6. Competence is regulated by special proteins include,
a) DNA binding protein b) Cell wall autolysin
c) Nucleases d) All of these
7. Plasmid having gene for exotoxin production in procaryotes is ,
a) R plasmid b) Conjugative plasmid
c) Virulence plasmid d) Col plasmid
8. Which of the following has no natural competence?
a) *Haemophilus influenzae* b) *Streptococcus pneumoniae*
c) *Bacillus subtilis* d) *Escherichia coli*
9. Transposable elements were discovered by:
a) Luria and Delbruck b) Joshua and Esther Lederberg
c) Barbara Maclintok d) Griffith
10. The gene transfer in which any gene is transferred from one host to another by bacteriophage is called
a) Generalized transduction b) specialized transduction
c) transformation d) None of these

Q-2 Do as directed (4+4=08)

A. Fill in the blanks (4)

1. When a mutation changes nucleotide sequence of a codon and convert it in stop codon, it is called..... (silentent mutation; Non sense mutation)
2. The first genes transcribed in the SOS response are those that encode the _____ proteins needed for nucleotide excision repair. (Uvr/ RecA)
3. Transduction was first demonstrated by.....in 1952. (Norton Zinder and J. Lederberg, Meselson and Stahl)
4. F plasmid is, ----- (Metabolic plasmid, Conjugative plasmid)

B. Mention true or false

1. Bromo Uracil induces mutation by adding methyl group.
2. RecA protein has strong affinity for Single stranded DNA.
3. Tn₃ is Replicative transposon.
4. Lambda coli phages are involved in specialized transduction.

Q-3 Attempt any ten (10) questions in short.

(20)

1. How mutation occurs by EMS?
2. What are mutations?
3. What is Holiday junction?
4. Differentiate induced and spontaneous mutation.
5. What is Excision repair?
6. What is recombination?
7. Draw an IS.
8. Mention differences of generalized and specialized transduction.
9. What is transformasome?
10. What do you mean by R- plasmid?
11. Enlist major characteristics that make bacteria useful tool for studying molecular genetics.
12. What is an episome?

Q-4 Attempt any four in detail (4x8=32)

(32)

1. Explain methods for isolation of auxotrophic mutants
2. Explain mode of action of U.V. rays and 5- bromo uracil as mutagenic agents.
3. Write an essay on: types of recombinations.
4. Explain: AMES test and its importance.
5. Explain transformation in *Streptococcus pneumoniae*
6. Explain mechanism of transposition.
7. Explain: plasmids and their types.
8. Explain discovery of conjugation and mating of F⁺ and F⁻