

SEAT No. _____

No. of Printed Pages : 02

[53/A-13]

SARDAR PATEL UNIVERSITY
B.Sc EXAMINATION - SEMESTER-VI
MICROBIOLOGY – US06CMIC21
(Molecular Biology)

Date: 15/07/2021

Time: 10:00 a.m. to 12:00 p.m.

Thursday

Total marks: 70

N.B: Figures on the right indicate marks.

Q.1 **Attempt following Multiple Choice Questions.** **10**

- 1 The Hfr chromosome is transferred to the F⁻ cell in a _____ fashion.
(a) circular (b) coiled
(c) dimer (d) linear
- 2 Which type of *E. coli* strain was chosen to prove the experiment of conjugation?
(a) prototrophs (b) double and triple prototrophs
(c) double and triple auxotrophs (d) Autotrophs
- 3 Which of the following is/are the function/s of Vi plasmids?
(a) Enterotoxin production (b) Fimbriae production
(c) Antibiotic production (d) All of the above
- 4 DNA segments that carry the genes required for transposition are called _____.
(a) Mobile genetic elements (b) Jumping genes
(c) (a) and (b) both (d) None of the above
- 5 Which of the following may be used as a vector?
(a) plasmids (b) phages
(c) (a) and (b) both (d) None
- 6 _____ procedure is enzymatic procedure for DNA sequencing.
(a) Sanger and Coulson (b) Maxam and Gilbert
(c) Lederberg and Tatum (d) Norton Zinder
- 7 Which of the following is not added during isolation of DNA?
(a) RNase inhibitors (b) Guanadinium thiocyanate
(c) Lysozyme (d) phenol
- 8 _____ first described the term DNA finger printing in 1986.
(a) William Hayes (b) Alec Jeffreys
(c) Joshua Lederberg (d) Carl Woese
- 9 Introduction of DNA in to cells by exposing to high voltage electric pulse is called _____.
(a) electrolysis (b) electrofusion
(c) electroporation (d) electrofission
- 10 Northern blotting is used for the separation of _____.
(a) RNA (b) DNA
(c) Protein (d) Protein- DNA complex



(1)

(P.T.O.)

Q.2 A Fill in the blanks with appropriate answer. 08

- 1 Transfer of the entire chromosome requires about _____ min. during Hfr conjugation in *E. coli*.
- 2 R plasmids are also called _____.
- 3 Only _____ restriction endonucleases are used for restriction mapping and gene cloning.
- 4 The PCR technique was developed by _____ in 1985.

B State whether the given statements are True or False.

- 1 Horizontal Gene Transfer is also referred to as vertical gene transfer.
- 2 Simple transposition is also called cut-and-paste transposition.
- 3 When restriction enzymes cut both the strands of a DNA molecule at the same site, the resulting termini have blunt ends.
- 4 Only RNA can be used as probes.

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

- 1 What is the importance of F' conjugation in Microbial Genetics?
- 2 What are the possible fates of exogenote in the recipient during HGT?
- 3 Draw diagram of U tube experiment with appropriate labeling.
- 4 What are the functions of plasmids?
- 5 Why *E. coli* is considered as the most ideal model organism for studying Molecular Biology?
- 6 Discuss briefly: Transposons.
- 7 What are the desirable features of M13 vectors?
- 8 Draw schematic diagram of steps involved in RNA extraction from cells or tissues.
- 9 Define the terms: (a) Linkers (b) Adaptors
- 10 What are the advantages of liposome- mediated gene transfer?
- 11 What is transfection?
- 12 Describe the term marker gene and differentiate between selectable marker and scorable marker.

Q.4 Answer the following LONG Questions:- (Attempt any four) 32

- 1 Write on bacterial transformation.
- 2 What is transduction? Discuss specialized transduction.
- 3 Discuss various mechanisms of development of drug resistance in bacteria giving suitable examples.
- 4 Write in detail on transposable elements and process of transposition in prokaryotes.
- 5 What is DNA sequencing? Discuss Sanger-Coulson procedure for DNA sequencing.
- 6 Write note on pBR322 vector.
- 7 Describe southern blotting in detail.
- 8 Discuss procedure of Polymerase Chain Reaction.



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(2)