

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

[A-25]

SARDAR PATEL UNIVERSITY

M. Sc. Integrated Biotechnology, Tenth Semester Examination

Day and Date: Monday, 09-04-2018

Time: 10:00 am to 1:00 pm

Paper Code and Subject: PS10CIGGB1, Microbial Genetics

Total Marks: 70

Q-1 Multiple choice questions (All are compulsory). [08]

- (i) Which of the following type of recombination does not require homologous sequences and is utilized by mobile genetic elements that move about chromosomes?  
 a) Mutagenic recombination      b) Site-specific recombination  
 c) Replicative recombination      d) General recombination
- (ii) Plasmid that carries genes encoding enzymes, which degrade substances such as aromatic compounds, pesticides or sugar are  
 a) F factors      b) metabolic plasmid      c) virulence plasmid      d) none of these
- (iii) Which of the following plasmids do not possess information for self-transfer to another cell?  
 a) Cryptic plasmids      b) Conjugative plasmids      c) Non-conjugative plasmids      d) None
- (iv) Although bacterial cells are haploid, F<sup>+</sup> plasmids carrying bacterial genes can create specific regions of \_\_\_\_\_  
 a) partial diploidy      b) F<sup>+</sup> cell      c) F<sup>-</sup> cell      d) F' cell
- (v) Which of the following genes are constitutively expressed and control the plant induced activation of other virgenes?  
 a) virA and virG      b) virC and virD      c) virB and virE      d) virA and virB
- (vi) Opines are  
 a) amino acid derivatives found in tumor tissues  
 b) amino acid derivatives found in normal tissues  
 c) amino acid derivatives found in both normal as well as tumor tissues  
 d) none of the above
- (vii) Which type of plasmid can exist with or without being integrated into the host's chromosome?  
 a) Medisome      b) Lisosome      c) Lysogen      d) Episome
- (viii) What is the term used for a segment of DNA with one or more genes in the center and the two ends carrying inverted repeat sequences of nucleotides?  
 a) Plasmid      b) Transposon      c) Insertion sequence      d) None of these

Q-2 Answer the following questions in short. (Any Seven) [14]

- (i) Define plasmid.
- (ii) Write a short note on Transformosome.
- (iii) Write the importance of competence in transformation.
- (iv) What do you mean by Merodiploid?
- (v) Write the importance of pilin protein.
- (vi) What are base analogs and intercalating agent.
- (vii) Write a note on complementation system.
- (viii) Define the term Apoptosis.
- (ix) What a note on composite transposon.

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- Q-3 (A) Discuss the structure of ColE1 plasmid and explain how its copy number is regulated. [ 06 ]  
(B) Explain the mechanism of Methyl-directed mismatch repair in *Escherichia coli*. [ 06 ]

OR

- (B) Discuss how Nucleotide Excision Repair (NER) enzymes cleave damaged DNA on either side of the lesion? [ 06 ]
- Q-4 (A) Draw the structure of labeled Ti plasmid and discuss the mechanism of interkingdom gene transfer. [06 ]  
(B) Discuss Holliday model for genetic recombination. [ 06 ]

OR

- (B) Discuss the mechanism of Hfr (high frequency of recombination) conjugation in *E. coli*. [06 ]
- Q-5 (A) Discuss the mechanism of transformation in *Streptococcus pneumoniae* in detail. [06 ]  
(B) Discuss the importance and mechanism of genetic mapping in bacteria by transformation. [06 ]

OR

- (B) Explain Generalized transduction mechanism of P22, which infects *Salmonella typhimurium*. [06 ]
- Q-6 (A) Discuss the importance of restriction and modification system (RM) in detail. [06 ]  
(B) Explain Insertion sequences and discuss the mechanism of transposition for bacterial Insertion sequences [06 ]

OR

- (B) Discuss the genetic organization of Tn3 and its mechanism of transposition. [06 ]

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