18 OCT 2019

M.Sc. (Microbiology) Semester III Examination October -2019

Paper X Microbial Genetics **Paper Code : 3691**

Time : 2:30 hrs **Total Marks :70**

Instruction : All questions carry equal marks

Q 1A : What are spontaneous mutations? Explain two experiments that proved randomness of mutation 14

OR

Write on : (a) Deletion mutations 07
(b) Retroposons 07

B: Answer any four : 04

(1) What is the main distinguishing feature between an insertion element and a transposon?
(2) Which of the following is a mutator?
(a) Dam Methylase (b) laccase (c) hydrolase (d) None
(3) Name the enzyme involved in transposition.
(4) Name the test that had been developed based on principle of reversion mutation and has application in carcinogenicity detection
(5) Who discovered the 'jumping genes'?
(6) In which of the following do transposable elements occur ?
(a) Prokaryotes (b) Eukaryotes (c) Both (d) None

Q 2 A : Discuss role of Rec BCD and RuvABC systems in recombination. 14

OR

Write on : (a) Rop protein mediated regulation of copy number in plasmid 07
(b) Integration of phage during lysogeny 07

B: Answer any four : 04

(1) What are tra gene components?
(2) What is the importance of transformation?
(3) What is the role of *par* system in plasmids?
(4) Whether ColE1 is a stringent or a relaxed plasmid?
(5) What is the importance of triparental mating?
(6) State contribution of Ikeda and Tomizawa with reference to genetic exchange among microbes.

Q 3 A: State characteristics of tumorigenic cells. Discuss the genes that work by 'gain of function' in developing cancer. 14

OR

Explain : (a) Operon based on light switching mechanism 07
(b) *his* operon 07

(PTO)

B: Answer any three : 03

(1) What are fusion proteins?
(2) What are house keeping genes?
(3) State any two environmental effects that may lead to cancer in an individual.
(4) Name the inducer of *lac* operon.
(5) Name the gene involved commonly in occurrence of majority of human cancers.

Q 4 A: Explain shuttle vector and mammalian expression vector in detail. 14

OR

Write on : (a) insertional inactivation 07
(b) Applications of RDT 07

Q 4 B: Answer any three 03

(1) What is the peculiarity of terminal nucleotidyl transferase?
(2)What is c-DNA?
(3)Name a physical method of identifying a plasmid containing a foreign DNA.
(4) For successful *in vitro* packaging using cosmid as a vector, the *cos* sites must be separated by bp range between
(a) 38 kb-54 kb (b) 15-35 kb (c) 55kb -85 kb (d) Any of these
(5) State two properties of a vector.
