

This question paper contains **3** printed pages]

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S. No. of Question Paper : **5773**

Unique Paper Code : **2532014701**

Name of the Course : **B.Sc. (Hons.) Microbiology**

Name of the Paper : **Microbial Genetics and Genomics**

Semester : **VII**

Duration : **3 Hours**

Maximum Marks : **90**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any *five* questions.

All questions carry equal marks.

1. Define the following (Any *six*) :

6×3=18

(i) Plasmid incompatibility

(ii) R-Plasmid

(iii) Mu transposon

(iv) Frame-shift mutations

(v) Insertion elements

(vi) Mismatch repair

(vii) Lethal mutations.

P.T.O.

2. (a) Write short notes on the following (Any *three*) : 3×5=15
- (i) Mechanism of transformation
 - (ii) Ty retrotransposons
 - (iii) Rolling Circle Model of plasmid replication
 - (iv) Genome analysis.
- (b) What are mutator genes ? Why are they important ? 3
3. (a) Differentiate the following (any *three*) : 3×5=15
- (i) Intragenic and intergenic suppression
 - (ii) Replicative and non-replicative transposition
 - (iii) Hfr and F' strains
 - (iv) Recombination-dependent and NHEJ repair mechanisms.
- (b) What do you understand by narrow and broad host range of plasmids ?
Explain with the help of examples. 3
4. (a) Give mode of action of the following mutagens (Any *three*) : 3×2=6
- (i) Acridine orange
 - (ii) 5-bromo uracil
 - (iii) EMS
 - (iv) Nitrous acid.
- (b) What do you understand by plasmid partitioning ? Explain with the help
of any *one* mechanism. 6
- (c) Explain mapping by co-transduction of markers. 6

5. (a) Explain the principle and application of Ames test. 6
- (b) Mention the functions of the following lambda phage proteins : $3 \times 2 = 6$
- (i) cIII
 - (ii) cI
 - (iii) Cro.
- (c) Describe genome organization of the following : $2 \times 3 = 6$
- (i) *Saccharomyces cerevisiae*
 - (ii) T4.
6. (a) What is plasmid curing ? How it can be achieved ? 4
- (b) Give evidence of horizontal gene transfer in fungi. 3
- (c) Discuss the mechanism of Ac/Ds transposons in maize. 5
- (d) Explain the following mutations (any two) : $2 \times 3 = 6$
- (i) Deletions
 - (ii) Duplications
 - (iii) Missense mutations.

