M. Sc. (Part–I) Examination

April / May – 2003

Microbiology : Paper – III

(Microbial Genetics & Biostatistics)

Time : **3** Hours]   [Total Marks : **100**

Instruction : All questions carry **equal** marks.

1   Answer any **two** :

   (a)   Explain "Prokaryotic genes and proteins are colinear."

   (b)   Describe co-transduction and its role in fine structure gene analysis.

   (c)   Describe DNA damage due to chemical and irradiation.

   (d)   Describe extrachromosomal inheritance by transposons with specific examples.

2   Answer any **two** of the following :

   (a)   How novel synthesis of RNA polymerase and utilization of promoters help the development of T_7 phage.

   (b)   Describe early development that help λ phage to establish lysogeny.

   (c)   Discuss molecular aspects of MS_2 development.

   (d)   What are mitotic recombination and mitotic disjunction ? Give their importance in fungal gene analysis.

3   Write any **two** :

   (a)   Briefly describe enzymes, role of plenov fragment and replisome complex for DNA replication.

   (b)   Describe in brief the process of transcription.

   (c)   What is operon concept ? Briefly describe the regulatory aspects of tryptophan operon.

   (d)   Describe activation and repression of arabinose operon.

4 Answer any **two** :

(a) Describe Southern blotting technique and give its role in genetic engineering.

(b) Describe stepwise procedure for purification of bacterial plasmid.

(c) Describe various means used for repair of termini of DNA molecules. Explain its importance.

(d) Enlist and explain the criteria of ideal vector.

5 Answer any **two** :

(a) Describe types of diagrams and their role in representing the data.

(b) Explain the experiment used to study main effects and interactions simultaneously.

(c) Explain measures used to determine central tendency of data. Give merits and demerits of the same.

(d) Explain normal distribution and its applications in biostatistics.

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