

Third Semester M.Sc. (Part - II) (C.B.C.S)
Examination

ZOOLOGY

Paper - X

Molecular Cytogenetics - II

P. Pages : 3

Time : Three Hours]

[Max. Marks : 80

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- Note :** (1) All questions are compulsory.
(2) All questions carry equal marks.
(3) Illustrate your answer with suitable diagrams wherever necessary.

1. Explain the followings :—

- (a) Structure of bacterial chromosome.
- (b) Types of bacteriophages.
- (c) Inheritance of mitochondrial genes.
- (d) Bacterial transformation.

OR

- (e) Structure of T4 phage.
- (f) Maternal inheritance of kappa particles in paramecium.

- (g) Bacterial conjugation.
 (h) Generalized transduction in bacteria. 16

2. Describe polytene chromosome and its significance of polytenization.

OR

Describe genetic and molecular basis of behavioral traits in **Drosophila**. 16

3. Explain the followings :—

- (i) Principle of polymerase chain reaction.
 (j) Genome of **Drosophila**.
 (k) Chromosome painting.
 (l) Flow cytometry.

OR

- (m) Fluorescence in situ hybridization.
 (n) Principle of DNA fingerprinting.
 (o) Automated DNA sequencing.
 (p) Genome of **E.Coli**. 16

4. Describe the Hardy-Weinberg principle of genetic equilibrium.

OR

Describe the molecular analysis of quantitative traits. 16

5. Give an account of the followings :—

- (q) Molecular clocks.
 (r) DNA-DNA hybridization in nucleic acid phylogeny.
 (s) Maximum likelihood method of phylogenetic tree reconstruction.
 (t) Nucleotide sequence comparisons and homologies.

OR

- (u) Restriction enzyme sites in nucleic acid phylogeny.
 (v) Mitochondrial DNA and evolution.
 (w) Alignment of protein sequences.
 (x) Distance-matrix method of phylogenetic tree reconstruction. 16

