M.Sc. Semester–III (CBCS) Examination

ZOOLOGY

(Molecular Cytogenetics–II)

Paper–X

Time : Three Hours] [Maximum Marks : 80

Note :— (1) All questions are compulsory.
(2) All questions carry equal marks.
(3) Draw well labelled diagram wherever necessary.

1. Describe the following :
   (a) Bacterial chromosome.
   (b) Maternal inheritance of kappa particles in paramecium.
   (c) Structure of T_4 phage.
   (d) Generalized transduction.

   OR

   (e) Types of bacteriophage.
   (f) Inheritance of shell coiling in Limnaea.
   (g) Specialized transduction.
   (h) Conjugation in Bacteria. 16

2. Describe genetic and molecular basis of behavioral traits in Drosophila.

   OR

   Describe polytenisation process in Drosophila and its significance. 16

3. Explain the following :
   (i) Applications of DNA fingerprinting.
   (j) Chromosome painting.
   (k) Applications of flow cytometry.
   (l) C. elegans – A genome model.

   OR

   (m) Maxam and Gilbert's chemical degradation method of DNA sequencing.
   (n) Principle of DNA fingerprinting.
   (o) Fluorescence in situ hybridization.
   (p) Drosophila genome. 16

4. Describe Hardy Weinberg principle of genetic equilibrium.

   OR

   Describe molecular analysis of quantitative traits. 16

5. Give an account of the following :
   (q) Protein phylogeny.
   (r) DNA-DNA hybridization.
   (s) Distance matrix method of phylogenetic tree reconstruction.
   (t) Mitochondrial DNA.

   OR

   (u) Restriction enzyme sites.
   (v) Molecular clocks.
   (w) Nucleotide sequence comparisons in nucleic acid phylogeny.
   (x) Mitochondrial DNA evolution. 16