2022

(November)

ZOOLOGY

(Honours)

(Cell and Molecular Biology and Genetics)

Marks : 56

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer Question No. **1** and *any* **four** from the rest

1. Write, in brief, on any *three* of the following : 4×3=12

(a) Activation of amino acid in the process of protein synthesis

(b) Fine structure of a gene

(c) Haemophilia

(d) Cytokines

(e) Principle of centrifugation

2. What is transcription? Explain the different steps of transcription in prokaryotes with suitable diagrams. 2+9=11

3. Define gene mutation. Give an account of the various types of gene mutation with examples. Describe Muller's ClB method used for the detection of mutation in *Drosophila*. 2+4+5=11

4. *(a)* What is sex-linked inheritance? Describe the pattern of sex-linked inheritance in man with a suitable example. 2+4=6

   (b) Explain the mechanism of dosage compensation with reference to females. 5

5. Describe the structure of an immunoglobulin molecule. Write a note on the major classes of immunoglobulins found in mammals. 4+7=11

6. *(a)* Write the principle of ion-exchange chromatography. Write a note on the application of this chromatographic techniques in biological research. 6

   (b) Differentiate between light and electron microscopy. 5

7. What do you understand by non-disjunction of sex chromosome? Discuss the primary and secondary non-disjunction of sex chromosomes in *Drosophila*. 5+3+3=11

(Continued)

8. Write short notes on any *two* of the following : 5½×2=11

   (a) Genome organization in eukaryotes

   (b) Phenylketonuria

   (c) Major Histocompatibility Complex (MHC)

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