No. of Printed Pages : 3 **MBC–008**

M. SC. (HONOURS)
(BIOCHEMISTRY)
(MSCBCH)
Term-End Examination
December, 2025

MBC-008 : GENETICS AND EVOLUTIONARY BIOLOGY

Time : 3 Hours *Maximum Marks : 100*

Note : *Answer any* ***five*** *questions. All questions carry equal marks.*

1. (a) Discuss recombination and explain the various types of recombination processes occurring in nature. 10

   (b) Describe the role and importance of r^{II} locus of T_4 phage and the concept of cistron. 10

2. (a) Explain the unique features and characteristics of *Drosophila* and *C. elegans* that make them model organisms. 10

   (b) Describe the laws of probability for predicting genetic outcomes. 10

3. (a) What are the different types of allelic variation ? Describe any *two* of them. 10

   (b) Differentiate the following : 5+5

   (i) X-linked recessive and X-linked dominant disorders

   (ii) Linked and Imprinted genes

4. (a) Describe gametogenesis and explain oogenesis in detail. 5+5

   (b) Explain early embryonic stages in the development of *Drosophila*. 10

5. (a) Discuss pedigree analysis. Enlist any *eight* standard symbols used in pedigree analysis. 10

   (b) Describe mechanisms underlying chromosomal aberrations. Explain variations in chromosome number. 10

6. (a) What are homologous sequences ? Classify them and explain their evolutionary relationship. 10

   (b) Explain the different types of human polymorphisms. 10

7. (a) Describe Luria Delbruck fluctuation test to support spontaneous mutation. 10

   (b) What are adult stem cells ? Explain its different types. 10

8. (a) Write a detailed note on *in-vitro* fertilisation (IVF). 10

   (b) Explain chromosomal sex determination mechanisms. 10

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