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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

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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

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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 determina-
tion mechanisms. 10

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