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MBC-008

M. SC. (HONOURS) BIOCHEMISTRY

(MSCBCH)

Term-End Examination

June, 2026

**MBC-008 : GENETICS AND EVOLUTIONARY
BIOLOGY**

Time : 3 Hours

Maximum Marks : 100

Note : (i) Answer any *five* questions.

(ii) All questions carry equal marks.

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1. (a) Describe gametogenesis. Differentiate between spermatogenesis and oogenesis. 10
 - (b) Explain environmental sex-determination. 10
 2. (a) What are model organisms ? Why are they crucial for scientific research ? Give *two* examples. 4+4+2

- (b) Discuss non-mendelian inheritance.
Give any *four* examples. $2\frac{1}{2} \times 4$
3. (a) Explain complementation and state the limitations of cis-trans test. 10
- (b) Describe linkage. Give experimental evidence of crossing-over of linked genes. 10
4. (a) Discuss the proof for chromosomal theory of heredity and cellular basis of Mendelism. 10
- (b) Describe the following : 5+5
- (i) Dominance relationships
- (ii) Lethal alleles
5. (a) Write a detailed note on HOX genes. 10
- (b) Describe the limitations and significance of pedigree analysis. 10
6. (a) Describe mechanisms underlying chromosomal aberration and explain variations in chromosome structure. 10

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- (b) Explain the molecular basis of evolution using nucleotide and amino acid sequence analysis. 10
- 7. (a) Describe Hardy-Weinberg Law with example. 10
- (b) Discuss different types of Mutations. 10
- 8. (a) Explain different types and properties of stem cells. 10
- (b) Write a detailed note on gene expression and human diseases. 10

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