

MASTER OF SCIENCE (ZOOLOGY)

(MSCZOO)

Term-End Examination

June, 2026

MZO-002 : GENETICS AND ANIMAL

BIOTECHNOLOGY

Time : 2 Hours

Maximum Marks : 50

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

(ii) All questions carry equal marks.

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1. (a) What are sex-linked, sex-limited and sex-influenced characters ? Explain with suitable examples. 6

- (b) What is epistasis ? Why do dihybrid cross studies by Mendel not show epistasis ? 4
2. (a) State the characteristics of *cis-trans* complementation test. 3
- (b) Explain any *one* mechanism of repair of DNA damage. 4
- (c) What are the different motifs available in eukaryotic transcription factors. 3
3. (a) What are epigenetic modifications ? State any *two* ways in which it can occur. 5
- (b) What is Aneuploidy ? Describe the syndromes associated with aneuploidy. 5

4. What is an Operon ? With suitable diagrams, explain how gene expression regulated in the Lac Operon in *E. coli*.

2+8=10

5. (a) Write a brief note on Rh factor alleles in humans. 5

- (b) What are the essential steps involved in the cDNA library construction. Explain with diagrams. 5

6. (a) What are Restriction Endonucleases ? What are its different types ? 6

- (b) Explain the types of sex determination. 4

7. Write short notes on the following :

$$2.5 \times 4 = 10$$

- (a) Applications of gene therapy
- (b) Next generation sequencing
- (c) CRISPR-cas9
- (d) Pleiotropy

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