

2025

M.Sc. 3rd Semester Examination

ZOOLOGY

Paper : ZOO - 304

(Old Syllabus)

Full Marks : 50

Time : Two Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

ZOO - 304.1

(Genetics)

1. Answer any *two* questions : 2×2=4

- (a) What is an X-linked dominant trait? Give one example in humans.
- (b) In a monohybrid cross of $Aa \times Aa$, what is the probability of getting aa offspring?
- (c) If a father is affected with an X-linked recessive disease, can he pass it to his sons? Explain briefly.
- (d) What is meant by the central dogma of molecular biology?

P.T.O.

2. Answer any *two* questions :

4×2=8

- (a) Explain the process of sex determination in *Drosophila*. How does it differ from sex determination in humans? 2+2
- (b) What is nondisjunction? Explain how it can lead to abnormal chromosomal numbers in offspring, giving one example in humans. 2+2
- (c) Define map distance. How is recombination frequency used to construct genetic maps? Give an simple example. 1+2+1
- (d) What is genetic linkage? Explain how crossing over leads to the formation of recombinant types in offspring. 1+3

3. Answer any *one* question :

8×1=8

- (a) (i) What is a pedigree chart? State any two symbols used in it.
- (ii) How can you identify an X-linked recessive trait from a pedigree?
- (iii) Unaffected parents have an affected son — what type of inheritance is this likely to be?
- (iv) State two differences between autosomal dominant and autosomal recessive inheritance.

2+2+2+2

(3)

- (b) Describe the experimental evidence that established the relationship between genes and chromosomes. Write the basic steps of DNA replication in prokaryote. What is the role of mRNA in protein synthesis? 4+2+2

ZOO - 304.2

(Basic and Applied Immunology)

1. Answer any *two* questions : 2×2=4
- (a) Name one hemopoietic tissue in invertebrates and one in vertebrates.
 - (b) What is the function of MHC molecules in the immune response?
 - (c) Give one example of a primary lymphoid organ and its role.
 - (d) Mention one practical application of each of ELISA and RIA.
2. Answer any *two* questions : 4×2=8
- (a) Describe the structure and function of phagocytic cells in the innate immune system.
 - (b) Outline the differences between antibodies and T-cell receptors in antigen recognition.

P.T.O.

(4)

- (c) Explain the difference between humoral and cell-mediated immunity with an example of each.
- (d) Discuss the structure and types of antibodies and their significance in the immune response.

3. Answer any *one* question : 8×1=8

- (a) Describe the organization of the immune system, including innate and acquired responses, and explain how they work together to protect the host. 4+4
- (b) Describe the blood cell types and their functions in mammals. Explain how structural differences reflect functional adaptations in immunity. 5+3

Internal Assessment : 10 marks
