2024
M.Sc.
Second Semester
CORE – 07
ZOOLOGY
Course Code: MZOC 2.31
(Technique in Biology)

Total Mark: 70 *Pass Mark: 28*
Time: 3 hours

Answer five questions, taking one from each unit.

UNIT–I

1. Write the theory of transmission electron microscope. Explain its structure and functions of the component. 7+7=14

2. (a) What is tissue culture? Explain the key steps involved in maintaining tissue culture. 2+5=7
   (b) How does autoradiography work and what are its applications in biological research? 2+5=7

UNIT–II

3. Explain the key steps involved in a polymerase chain reaction (PCR), and how does it amplify DNA fragments. Write a note on the application of polymerase chain reaction. 10+4=14

4. Write notes on the following: $7 \times 2 = 14$
   (a) Ion exchange chromatography
   (b) Sequencing of nucleic acids

UNIT–III

5. Write the concept on variables in biostatistics. Explain the various types of variables in detail. 4+10=14

6. Find out the mean and standard deviation from the following data:
   15, 17, 19, 25, 30, 35, 48. 7+7=14

UNIT–IV

7. Calculate Karl Pearson's correlation between *X* and *Y*-series from data given below: 14

X-series	12	9	8	10	11	13	7
Y-series	14	8	6	9	11	12	3

8. Write short notes on the following: 7×2=14
   (a) Properties of Poisson distribution with example
   (b) Properties of t-test

UNIT–V

9. Perform the following sequence alignment by using Needleman-Wunsch algorithm.
   Sequence 1-CCGTCG
   Sequence 2-CCGCG
   Add a note on the introduction to bioinformatics. 10+4=14

10. Write short notes on the following: 7×2=14
    (a) BLAST
    (b) Pairwise alignment