C/18/DDE/MSc/Part-I/ZOO/3B

2018

M.Sc. Part–I Examination

ZOOLOGY

PAPER—III (Group—B)

Full Marks : 50

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer any *four* questions taking *two* from each unit.

Unit—I

(*Immunology*)

1. (a) What are the kinetics of Primary and secondary humoral immune responses ?

   (b) What is Adjuvants ? Explain with example and mention its mode of action.

(c) What is protasome complex ? 5½+2+2+3

2. (a) What is Monoclonal Antibody (MAb) ? Discuss in brief the procedure for MAb production. Write its applications.

(b) Write the principle of Western blotting hybridization. 2½

3. (a) What are hypervariable regions of heavy and light chains of an antibody molecule. 4

(b) How are they generated ? 7

(c) Which immunoglobulin can pass through the plancenta ? 1½

4. (a) How lectins activates complement pathway ? 3

(b) Describe the alternative pathway of complement system with suitable flow chart. 7

(c) Write the biological function of compliments. 2½

Unit—II

(*Biostatistics*)

5. (a) Write short notes on any *two* of the following : 2×4

(i) Frequency polygon ;

(ii) Coefficient of variation ;

(iii) Histogram ;

(iv) Properties of product-moment correlation coefficient.

(b) Write short notes on : 4½

Level of significance ;

Or

Properties of normal probability distribution.

6. (a) Compute the variance and standard deviation of the following femur length score (mm × 10^{-2}) of a sample of aphids.

35, 36, 42, 32, 40, 41, 38, 33, 30, 34 5

(b) Compute the mean and median of the wing length scores (mm) of an insect. 4

Wing length	20-23	24-27	28-31	32-35	36-39	40-43	44-47
Frequency	10	12	14	30	16	10	8

7. (a) The mean Ca^{++} concentration (mg/L of body fluids) were found to be 16.5 (SD 4.27) and 5.26 (SD 1.28) in the extravascular and intracellular fluids of an arachnid. Compare the variabilities of Ca^{++} concentrations in the two fluids. 3½

(b) Define correlation and regression. 3

(c) Compute the product moment correlation coefficient between the following scores of lengths (X) and weight (Y) of certain body parts of an animal.

X (mm)	8.5	8.8	8.0	11.0	9.3	10.5	6.3	7.5	10.0	8.2
Y (mg)	5.6	5.0	6.0	5.1	5.8	5.8	4.8	6.0	6.3	5.1

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8. (a) The probability of male birth is 0.49 and female birth is 0.51. If the total number of children born is 4, then what is the probability of

(i) 3 male children, and

(ii) no male children ? 5

(b) On crossing between F_1 pea plants, the F_2 generation shows the following phenotypes.

Tall-wrinkled : 350 Dwarf-wrinkled :130

Tall-normal : 860 Dwarf-normal : 260

Test whether the data is compatible with Mendelian 9: 3 :3 : 1 ratio. $[\chi^2_{0.05(3)} = 7.815]$ 5½

(c) Mention two properties of Poisson distribution. 2

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