2017

M.Sc. Part-I Examination

ZOOLOGY

PAPER—III (Group—B)

Full Marks : 50

Time : 2 Hours

The figures in the margin indicate full marks.

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

Illustrate the answers wherever necessary.

Group—B

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

Unit—I

(*Immunology*)

1. (a) What is NK cells. Mention its role in ADCC.

   (b) What is titer ?

   (c) Describe the biological structure and function of IgA molecule with labelled diagram. $(2+3)+2\frac{1}{2}+5$

(Turn Over)

2. (a) State the mechanism of formation of C5 convertase by classical pathway with proper diagram.

   (b) Mention the name and function of different receptors present on the B-cell. $6\frac{1}{2}+6$

3. (a) Write the principle and application of Southern Blotting Hybridization. How this technique differs from Western Blotting Hybridization?

   (b) What is Perforin ? $2+2+6\frac{1}{2}+2$

4. (a) Distinguish between (any *two*) : 4×2

      (i) MHC class I and MHC class II

      (ii) Necrosis and Apoptosis

      (iii) Sequential epitope and conformational epitope.

   (b) State the role of CLIP protein and proteasome complex in antigen presentation. $4\frac{1}{2}$

Unit—II

(*Biostatistics*)

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

      (i) Frequency distribution ;

      (ii) Ordinal variable ;

      (iii) Testing of hypothesis ;

      (iv) Z-Score

   (b) Write short notes on : $4\frac{1}{2}$

      Normal distribution and its properties ;

      Or

      Types of Correlation.

6. (a) What is random sampling ? Mention its advantages. $1\frac{1}{2}+2$

   (b) Find the mean deviation about mean from the following data : 4

Class Boundaries	0-10	10-20	20-30	30-40	40-50
Frequency	14	23	27	21	15

   (c) The data shows a value of $N_1 = 15$, $N_2 = 10$, $\Sigma X_1 = 1331$, $\Sigma X_2 = 949$, $\Sigma x_1^2 = 8980.86$, $\Sigma x_2^2 = 2236.9$

      Find out whether there is any significant difference between the data. Given value $\alpha_{0.05} = 1.71$. Draw your inference. 5

7. (a) The overall percentage of negative response in a clinical test is 30. What is the probability that out of a group of 10 patients 3 will response positively to the test. 4

(b) Two variates X and Y when expressed as deviation from their respecive means are given as follows.

Find their standard deviations and co-efficient of correlation and test its significant at 5% level.   6

$[t_{0.05}(9) = 2.26]$

−4, −3, −2, −1, 0,   1, 2,   3,   4,

−3, −3, −−4, 0,   4,   1, 2, −2, −1

(c) State the properties of correlation cofficient. $2\frac{1}{2}$

8. (a) Four different pesticide solutions are being compared to examine their effectiveness in controling pest. The data are given below : $6\frac{1}{2}$

Number of days

Pesticide soln.	1	2	3	4
A	05	05	07	21
B	14	16	18	44
C	17	22	15	39
D	11	18	02	25

Is there any significant difference in their effectiveness at 0.05 level in (2, 9) degree of freedom is 5.14.

(b) The following table provide the gall bladder function in patients with presentation of Gastroesophageal Reflux Disease (GERD) before and after treatment.

Before Treatment (%)	22	63.3	96	9.2	3.1	50	33	69	64	18.8	34	34
After Treatment (%)	63.5	91.5	59	37.8	10.1	19.6	41	87.8	86	55	88	40

Test whether there has been any significant improvement after treatment given.   6

$t_{0.05, \ 11} = 1.796$

$t_{0.05, \ 12} = 1.782$

$t_{0.05, \ 10} = 1.812$