2022

M.Sc.

4th Semester Examination

ZOOLOGY

PAPER—ZOO-401

Full Marks : 40

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.

ZOO–401.1

ENVIRONMENTAL POLLUTION AND MANAGEMENT

1. Answer any *two* questions :   2×2

   (a) Differentiate ecodegradation from environmental pollution.

(b) Differentiate pollutants from contaminants.

(c) Differentiate biomagnification from biotransformation.

(d) Differentiate National Park from Sanctuary.

2. Answer any *two* questions :   2×4

   (a) Define eutrophication. Mention its different ecological consequences.   1+3

   (b) Discuss on multifarious environmental impact of chemical fertilizers.

   (c) Mention different ecological contributions of wildlife with suitable examples.

   (d) Highlight the merits and demerits of biomonitoring.   2+2

3. Answer any *one* question :   1×8

   (a) What are the different components of environmental management ? Discuss on the sequential steps of environmental monitoring process. Enlist major pillars for Green Mevement.

(Continued)

3+3+2

(b) Schematically represent different goods and services of biodiversity. Mention the significance of traditional knowledge in biodiversity assessment and conservation. Add a note on 'Sacred Groves'. 3+2+3

ZOO–401.2 BIOSTATISTICS

4. Answer any *two* questions : 2×2

(a) State the properties of regression coefficient.

(b) Biochemical evidence shows that tripeptide consists of phenylalamine, methionine & lysine

(i) how many mutations are possible ?

(ii) how many combinations are possible ?

(c) Write a short note on measures of dispersion.

(d) State the difference between parametric and non-parametric test.

5. Answer any *two* questions : 2×4

(a) In a partially destroyed laboratory record of an analysis of correlation data the following results only are legible.

Variance of x = 9

Regression equations : 8x – 10y + 66 = 0

40x – 18y = 214

What are :

(i) the mean value of x and y.

(ii) the coefficient of correlation between x and y.

(iii) the standard deviation of y ?

(b) Find whether or not there is a significant multiple linear correlation between glomerular filtration rate (X_1 ml/min) on glomerular blood pressure (X_2 mm/Hg) and capsular fluid pressure (X_3 mm/Hg) using the following data

of a sample of 40 patients ($\alpha = 0.05$)

$r_{12} = 0.82$, $r_{13} = -0.21$ and $r_{23} = 0.18$

$t_{0.05(37)} = 2.026$, $t_{0.05(38)} = 2.024$, $t_{0.05(40)} = 2.021$

(c) Find out the regression coefficients of b_{xy} and b_{yx} if

$$\sum x = 50, \bar{x} = 5, \sum y = 60, \bar{y} = 6$$

$$\sum xy = 360, \sigma_x = 4, \sigma_y = 9$$

(d) State the properties of Normal distribution. Draw a normal curve showing area under the curve. 2+2

6. Answer any *one* question : 1×8

(a) The four rice varieties are grown on 5 plots on radom and yields are given the table below. Find out if differences are significant at 5% level. $F_{0.05(3,\ 16)} = 3.24$

Varietics	Plots				
Variety A :	20	25	22	26	21
Variety B :	11	15	10	13	12
Variety C :	31	35	30	33	34
Variety D :	28	25	33	29	27

(b) (i) Write a short note on skewness and kurtosis.

(ii) Followings are the ranks obtained by 10 students in two subjects : Statistic and Mathematics. To what extent is the knowledge of students in the two subjects related ?

Statistics :   1   2   3   4   5   6   7   8   9   10

Mathematics :   2   4   1   5   3   9   7   10   6   8

4+4

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