PG/IVS/ZOO-401/15

M.Sc. 4th Semester Examination, 2015

ZOOLOGY

PAPER – ZOO-401

Full Marks : 40

Time : 2 hours

Answer **all** questions

The figures in the right hand margin indicate marks

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

Illustrate the answers wherever necessary

GROUP – A

(Biodiversity, Pollution and Environmental Management)

1. Answer any *two* questions of the following : 2 × 2

(*a*) Mention the criteria for considering a place as to be biodiversity 'Hot-Spot'.

(*b*) What is SLOSS ?

(*c*) Differentiate ecodegration from pollution.

(*d*) What is meant by IUCN Red list version 3·1 ?

2. Answer any *two* questions from the following : 4×2

(*a*) Highlight the merits and demerits of Environmental Protection Act, 1986.

(*b*) Differentiate point and non point pollution with examples.

(*c*) Explain briefly multidimensional harmful impacts of chemical fertilisin.

(*d*) Briefly discuss on the sources of Noise pollution.

3. Answer any *one* question of the following : 8×1

(*a*) Define sustainable development. Mention its different components. Add a note on the steps of environmental management. $2 + 2 + 4$

(*Continued*)

(*b*) Explain the role of meteorological parameters in the formation of Acid Rain. Differentiate the process of bioaccumulation, biotransformation and biomagnification in respect of a persistant pollutant. Mention about world conservation strategy. 3 + 3 + 2

GROUP – B

(*Biostatistics*)

4. Answer any *two* questions of the following : 2 × 2

(*a*) Explain type-I error and type-II error of inference.

(*b*) 'When the frequency distribution is not symmetrical if said to be' _____ (Skewness/Kurtosis/ Poisson distribution) Choose the correct answer and explain.

(*c*) Prove that Arithmetic mean of regression co-efficients is greater than the correlation co-efficient.

(*d*) What are Prior and Posterior Probability ?

5. Answer any *two* questions of the following : 4 × 2

(*a*) What is Binomial distribution ? Write the formula for computing Binomial probability distribution using Bernoulli expression. State any four properties of Binomial distribution. 1 + 3

(*b*) Marks of 10 students of Zoology of Vidyasagar University in Biochemistry and Biostatistics are given below :

Marks of Biochemistry :	15	20	24	14	24	25	21	18	14	20
Marks of Biostatistics :	8	12	15	17	19	17	15	20	12	17

Calculate Spearman's co-efficient of rank correlation. 4

(*c*) What is correlation co-efficient ? Calculate the probability of random occurrence of 6 male and 4 female Drosophila in a sample of ten individuals, drawn from a population having equal male to female ratio. 1 + 3

(*d*) Two strains of albino mice were grown under the same conditions but fed with two different combination of food. Twenty adult mice in strain of the same age and sex were then measured for body weight (in gms) and results were as follows :

Strain	Mean body weight	Variance
A	16	16
B	28	25

Is there any significant difference in body weight between two strains ?

Critical *t* value : $t_{0\cdot05\,(38)} = 2\cdot02$. 4

6. Answer any *one* question of the following : 8×1

(*a*) (*i*) Prove that correlation co-efficient '*r* ' lies between –1 and +1.

(*ii*) 10 persons were recorded with age (*X*) and systolic blood pressure (*Y*)

the results are given below :

Variable	Age(X)	Blood pressure (Y)
Mean	5·3	142
Variance	130	165

$$\Sigma (X - \bar{X})(Y - \bar{Y}) = 1220$$

Find the appropriate regression equation and estimate the blood pressure of a person whose age is 60 years. 5 + 3

(*b*) (*i*) In a laboratory experiment different concentrations of plant cytokinin were applied on the leaves and the emergence of roots were tested. The following results were obtained.

Number of roots emerged under different concentration of cytokinin (PPM)

Replicates	0(PPM)	5(PPM)	10(PPM)	15(PPM)
1	1	2	3	5
2	2	3	3	4
3	1	3	4	5
4	0	4	3	4
5	1	3	4	4

Apply one way anova to test whether the different concentration have any effect on root emergence.

[Given $F_{0.05\,(3,\,16)} = 3{\cdot}24$; $F_{0.01\,(3,\,16)} = 5{\cdot}3$]

(*ii*) Explain One tail and Two tail test with proper diagram. 6 + 2
