No. of Printed Pages : 5

RLS–103

Ph. D. IN LIFE SCIENCES

(PHDLS)

Term-End Examination

December, 2025

RLS-103 : BIOSTATISTICS AND COMPUTER APPLICATIONS IN BIOLOGICAL RESEARCH

Time : 3 Hours *Maximum Marks : 100*

***Note** : Attempt any **five** questions. All questions carry equal marks. Simple calculator is allowed. Statistical tables will be provided on demand.*

1. The data related to the marks obtained by 10 students is given here : 20

   20, 16, 15, 13, 14, 18, 12, 11, 17, 19

   Calculate the mean, median, mode, variance and standard deviation for the data.

2. Write short notes on any *four* of the following : 20

   (a) Non-parametric test

   (b) Ogive

   (c) Paired *t*-test

   (d) SPSS data analysis tool

   (e) Critical Difference (CD) of treatment means

3. The data for the two variables X (theory marks) and Y (practical marks) for 10 pupils is given here : 20

X	Y
45	42
54	50
52	80
58	46
62	69
46	41
55	46
49	77
50	45
54	48

Calculate the correlation between the two variables.

4. (a) List any *five* differences between primary and secondary data. 5

   (b) How is the optimum sample size determined in field experiments ? 5

   (c) What is a contingency table ? Explain giving *one* example and discuss its uses in biological research. 10

5. (a) Weight measurement of 7 boys and 10 girls, aged 1-5 years is given here :

Boys	Girls
13	10
14	16
11	12
12	13
15	18
13	13
13	19
	14
	13
	12

Calculate the significance of the difference between mean weight score between the two groups. 10

(b) Differentiate between the following : 10

(i) Skewness and kurtosis

(ii) *t*-test and F-test

(iii) Discrete distribution and continuous distribution

(iv) Percentile and quartile

6. (a) In an experiment of throwing two fair dice, find the probability of getting : 5×2=10

(i) a doublet

(ii) Sum 7

(iii) Sum 8

(iv) 3 on first dice and multiple of 2 on second dice

(v) Sum is 11 or 12

(b) Define the following terms : 5×2=10

(i) Normal distribution

(ii) Z-score

(iii) Confidence interval

(iv) Degrees of freedom

(v) Sensitivity

7. (a) Write any *five* advantages of sampling over complete enumeration. Explain any *one* of the sampling schemes.

5+5=10

(b) Describe the method of testing the independence of two attributes using χ^2 test. 10

× × × × ×