Exam.Code:0041
Sub. Code: 1004

1127

B.Sc. (Hons.) Bio-Informatics

Third Semester

BIN-3004: Statistical Methods

Time allowed: 3 Hours Max. Marks: 60

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit. Simple Calculators are allowed. Statistical tables may be provided on demand.*

x-x-x

Q.1 Compulsory Question

(a) Write down the regression equation of Y on X
(b) What is the sampling distribution of sample mean, if population is normal
(d) Where Yate's correction is applicable?
(e) Define Type-II error
(g) What is the difference between parametric and non-parametric statistics?
(h) State two-way classification model and its underlying assumptions.

(6 x 2 = 12)

UNIT-1

Q.2 (a) Define Karl Pearson's Correlation coefficient? Work out its expression and state its important properties.

(b) In the study of the relationship between Age and EEG, data was collected on subjects between the age of 20 and 60 years.

Age (x)	EEG (y)	Age (x)	EEG (y)
20	98	40	68
21	75	42	66
22	95	44	75
24	100	46	62
27	99	48	69
30	65	51	64
31	64	53	63
33	70	55	52
35	73	60	55
38	74	58	67

For this data

(i) Draw scatter diagram and give your comments

(ii) Compute Spearman's Rank correlation coefficient.

(6, 6)

P.T.O

Q.3 (a) Define the term regression. How will you interpret the regression coefficients in a regression equation? Can we determine correlation from these coefficients, if yes, how?

(b) The following data is related to height (in cms.) and weight (in Kg) of 12 males between the ages of 19 and 26 years

Weight	Height	Weight	Height	Weight	Height
83.9	185	65.3	175	56.4	164
99.0	180	79.6	183	66.2	169
63.8	173	70.3	184	88.7	205
71.3	168	69.2	174	59.7	161

For this data fit the regression equation of Weight on Height and predict weight, when height is 178 cm.

(6, 6)

Q.4 (a) How will you construct 100 $(1-\alpha)$ % confidence intervals for difference between two Population proportions, when the populations are normally distributed.

(b) (i) How one can compute sample size in case of a single sample mean?

(ii) A survey was conducted to see what proportion of families in a certain area are suffering from TB. It is believed that the proportion cannot be greater than 0.25. A 95% confidence interval is desired with d=.05. What should be the sample size?

(6, 6)

UNIT-II

Q.5 (a) Define

(i) Critical region

(ii) Null and Alternative hypothesis

(iii) Critical points for standard normal (both for one-sided and two-sided alternatives)

(b) Describe the procedure for testing H_0: $\mu_1 = \mu_2$, against H_1: $\mu_1 \neq \mu_2$ when the two populations are normally distributed. Also obtain 100 $(1-\alpha)$% confidence intervals for $\mu_1 - \mu_2$.

(6, 6)

Q.6 Write short note on any ***two*** of the following:

(i) Treatment, plot and block

(ii) Chi-square test for association of attributes

(iii) RBD design, ANOVA table and underlying hypothesis.

(6, 6)

Q.7 (a) Explain One-way ANOVA model, its assumptions, and ANOVA table.

(b) Discuss (i) Sign test, and (ii) Mann-Whitney test.

(6, 6)

x-x-x