



CBCS SCHEME

18BT31

Third Semester B.E. Degree Examination, Jan./Feb. 2021 Biostatistics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Calculate mean, median and mode of the height of trees in the Bannerghatta forest. Data is given below.

Height of trees (Inches)	Number of trees
95-105	19
105-115	23
115-125	36
125-135	70
135-145	52

(16 Marks)

- b. The following frequency graph data shows the number of adult visitors and child visitor to the hospital. Plot a divided bar diagram.

Month	April	May	June
Number of adults	300	500	700
Number of children	200	600	600

(04 Marks)

OR

- 2 a. How is randomized controlled studies useful in clinical research? (08 Marks)
b. Determine the main effect and intersection effect of temperature and time on the response from the following data:

Exp. No.	Temperature	Time	Response
1	100	60	51
2	100	90	56
3	150	60	53
4	150	90	59

(12 Marks)

Module-2

- 3 a. Amount of glucose estimation (mg/ml) by 2 methods in 10 trials are given below. Which method is regarded as more consistent? (12 Marks)

Method 1	58	59	60	54	65	66	52	75	69	52
Method 2	84	56	92	65	86	78	44	54	78	68

- b. What is a variable in biostatistics? With example, explain the type of variables. (08 Marks)

OR

- 4 a. Differentiate between. Case-Control study and co-host study. (10 Marks)
 b. How is the testing of hypothesis done statistically? (10 Marks)

Module-3

- 5 a. Effect of a drug on a patient was study, the production of B-lymphocytes cell war recorded (10^6). Data is below. Find out the correlation coefficient.

Conc. Of drug (Mg)	39	65	62	90	82	75	25	98	36	78
No. of B lymphocytes (10^6)	47	53	58	86	62	68	60	91	51	84

(10 Marks)

- b. In an experiment with 20 subjects of male between the age of 25-35 who volunteer for the experiment. One half of the group war given coffee containing caffeine and other was given decaffeinated coffee as a placebo/control. Pulse rate was measured after the subject drink coffee and results are below. Test the hypothesis that caffeine has no effect on pulse rate (beats/minute).

Placebo	72	76	66	68	68	74	60	64	72	60
Caffeine	76	80	78	84	72	66	68	76	76	74

Use t_{tab} at $\alpha = 0.05 = 2.10$

(10 Marks)

OR

- 6 a. To test the hypothesis that the average number of days a patient is kept in 3 local hospitals say A, B and C is the same.
 A random check on the number of days that seven patients stayed in each hospital reveals the following. Test at $\alpha = 0.05$ with $F_{\text{tab}} = 3.55$

Hospital A	8	5	9	2	7	8	1
Hospital B	4	3	8	7	7	1	5
Hospital C	1	4	9	8	7	2	3

(16 Marks)

- b. A college statistics professor claims that the median test score for his students last test is 58. The scores for 18 randomly selected test are listed below. At $\alpha = 0.01$, can you reject professor claim? Use table value = 2. (04 Marks)

58	62	55	55	53	52	52	59	55
55	60	56	57	61	58	63	63	55

Module-4

- 7 a. Four rice varieties were grown in 4 replication in randomized block design and their yield/plot was assessed. From yield data do you consider that the mean yield of varieties differ among themselves.

A ₅	G ₀	B ₂	D ₁₀
B ₄	A ₆	C ₁₂	D ₉
D ₉	A ₅	B ₂	C ₁₁
C ₁₂	B ₃	A ₇	D ₈

Use table value (5% = 3.9, 1% = 7.0, 0.1% = 13.9).

(16 Marks)

- b. What are the sources of variation in an experiment? (04 Marks)

OR

- 8 a. Find the least square polynomial approximation of degree two to the data:

x	0	1	2	3	4
y	-4	-1	4	11	20

- (08 Marks)
- b. What is Correlation? What are the methods of determining correlation? Discuss different types of correlation in detail with example. (08 Marks)
- c. What are the reasons for correlation of 2 variables? (04 Marks)

Module-5

- 9 a. What is data set in SAS program? Also discuss the data sources available in SAS. (07 Marks)
- b. What are variables in SAS program? Explain the types of variables in SAS. (08 Marks)
- c. Write the basic syntax of sort operation in data set in SAS. (05 Marks)

OR

- 10 a. Write syntax for the following operation:
- Create Histogram
 - Create bar-chart
 - Create scatter plot. (12 Marks)
- b. Write syntax for basic statistical procedure:
- Arithmetic Mean
 - Standard deviation. (08 Marks)
