CBCS SCHEME

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18BT31

Third Semester B.E. Degree Examination, June/July 2023
Biostatistics

Time: 3 hrs. Max. Marks: 100

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

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Calculate the Mode , Median and Arithmetic Average from the following data :

Class	0-2	2-4	4-10	10-15	15-20	20-25	25-30	30-40	40-50	50-60	60-80	80-100
f	8	12	20	10	16	25	45	60	20	13	15	4

(10 Marks)

b. Represent the following data graphically :
i) Histogram ii) Frequency polygon iii) Frequency curve
iv) Histogram and frequency polygon.

Plant height (cms)	0-6	6-12	12-18	18-24	24-30	30-36	36-42	42-48	48-54
No. of plants	3	12	42	51	56	48	35	15	6

(10 Marks)

OR

2 a. The following are the data pertaining to the number of flowers per twig. Calculate the Mean deviation from Mean and its coefficient for number of flowers.

No. of flowers per twig (x)	11-15	16-20	21-25	26-30	31-35	36-40	41-45
No. of twigs (f)	3	4	11	12	9	7	4

(10 Marks)

b. Define i) Factorial design ii) Cluster design iii) Historically controlled studies iv) Completely Randomized block design. **(10 Marks)**

Module-2

3 a. If the mean and standard deviation of the number of correctly answered questions in a test given to 4096 students are 2.5 and $\sqrt{1.875}$. Find an estimate of the number of candidates answering correctly.
i) 8 or more questions ii) 2 or less questions iii) 5 questions. **(10 Marks)**

b. In a test on electric bulbs, it was found that life time of a particular brand was distributed normally with an average life of 2000 hours and S.D of 60 hours. If a firm purchases 2500 bulbs find the number that are likely to last for i) more than 2100 hours ii) less than 1950 hours iii) between 1900 to 2100 hours.
Note : $\phi(1.67) = 0.4525$; $\phi(0.83) = 0.2967$. **(10 Marks)**

OR

4 a. Explain Binomial distribution, Normal distribution in detail. **(10 Marks)**

b. In a normal distribution 31% of the items are under 45 and 8% of the items are over 64. Find the mean and S.D of the distribution.
Note : $\phi(0.5) = 0.1915$; $\phi(1.4) = 0.42$. **(10 Marks)**

Module-3

5 a. From the following data, calculate the Rank correlation coefficient after making adjustment for tied ranks. **(10 Marks)**

x	48	33	40	9	16	16	65	24	16	57
y	13	13	24	6	15	4	20	9	6	19

b. If the two lines of regression are $4x - 5y + 30 = 0$ and $20x - 9y - 107 = 0$ which of these is the line of regression of x on y and y on x. find r_{xy} and σ_y when $\sigma_x = 3$. **(10 Marks)**

OR

6 a. From the data given below, use Analysis of variance in one – way classification, to find out whether the means of the three samples differ significantly or not.

Sample 1	20	10	17	17	16
Sample 2	19	13	17	12	9
Sample 3	13	12	10	15	5

Note : F value at 0.05 is 3.9. **(10 Marks)**

b. A group of 10 boys fed on a diet A and another group of 8 boys fed on a different diet B for a period of 6 months recorded the following increase in weights (ℓbs).

Diet A :	5	6	8	1	12	4	3	9	6	10
Diet B :	2	3	6	8	10	1	2	8		

Test whether diets A and B differ significantly regarding their effect on increase in weight.
Note : $t_{0.05}$ for 16 d.f = 2.12. **(10 Marks)**

Module-4

7 a. A set of data involving four tropical feed stuffs A, B, C, D tried on 20 chicks is given below. All the twenty chicks are treated alike in all respects except the feeding treatments and each feeding treatment is given to 5 chicks. Analyse the data using CRD.
Weight gain of baby chicks fed on different feeding materials composed of tropical feed stuffs :

						Total
A	55	49	42	21	52	219
B	61	112	30	89	63	355
C	42	97	81	95	92	407
D	169	137	169	85	154	714
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Note : F at 0.05 level $= 3.24_{(3, 16)}$; F at 0.01 level $= 5.29_{(3, 16)}$. **(10 Marks)**

b. Explain about the Randomised complete design model. **(10 Marks)**

OR

8 a. Three varieties A, B and C of Mungbean are tested in a randomized block design with four replications. The plot yield in pounds are as follows :

A : 6 ,	C : 5 ,	A : 8 ,	B : 9
C : 8 ,	A : 4 ,	B : 6 ,	C : 9
B : 7 ,	B : 6 ,	C : 10 ,	A : 6

Analyse the experimental yield and state your conclusion by using RCBD. **(10 Marks)**

b. Data recorded on yield of six varieties in an experiment with four replications for which one value is missing. Estimate the missing value and analyse the data.

Treatments

Replications block	1	2	3	4	5	6
1	18.5	15.7	16.2	14.1	13.0	13.6
2	11.7	X	12.9	14.4	16.9	12.5
3	15.4	16.6	15.5	20.3	18.4	21.6
4	16.5	18.6	12.7	15.7	16.5	18.0

Note : $F_{0.01}(5, 14) = 4.69$ and $F_{0.05}(3, 14) = 3.34$. **(10 Marks)**

Module-5

9 a. Write the SAS representation of simple bar chart for the length of cars as bars. **(10 Marks)**

b. Explain about one sample t – test in SAS. **(10 Marks)**

OR

10 a. Explain about PROC statements in SAS. **(10 Marks)**

b. What is ANOVA in SAS? Mention the parameters used for ANOVA in SAS programming. **(10 Marks)**

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