



B.Tech III Semester Regular Examinations, February 2022
STATISTICAL METHODS

(Common to CSE(AI&ML) and CSE(DS))

Maximum Marks: 70

Date: 22.02.2022 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 Find the arithmetic mean of 10,15,30,7,42,79,83.
- 2 Define harmonic mean
- 3 Define mean deviation about mean.
- 4 What is meant by skewness and kurtosis.
- 5 List the properties of good estimator.
- 6 What is meant by point estimation.
- 7 What are parameters and statistics in sampling?
- 8 Define Type I and Type II errors in taking a decision.
- 9 Define coefficient of correlation.
- 10 State any two properties of regression coefficients.

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 (a) The following table gives the marks of 58 students in Statistics. Calculate the average marks of this group.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. Of Students	4	8	11	15	12	6	2

5M

- (b) Find median for the following data

x	80-100	100-120	120-140	140-160	160-180	180-200
f	18	25	30	34	26	10

5M

OR

- 12 (a) Find the median for the following data

CI	0-10	10-20	20-30	30-40	40-50	50-60	60-70
f	6	12	22	37	17	8	5

5M

- (b) Find mode for the following data

CI	30-40	40-50	50-60	60-70	70-80	80-90	90-100
f	4	6	8	12	9	7	4

5M

- 13 (a) In a small business firm, two typists are employed-typist A and typist B. Typist A types out, on an average, 30 pages per day with a standard deviation of 6. Typist B, on an average, types out 45 pages with a standard deviation of 10. Which typist shows greater consistency in his output?

5M

(b) For a distribution, Bowley's coefficient of skewness is - 0.56, $Q_1=16.4$ and Median=24.2. What is the coefficient of quartile deviation?

5M

OR

- 14 From the following data, calculate the measure of skewness using the mean, median and standard deviation:

10M

CI	0-10	10-20	20-30	30-40	40-50	50-60	60-70
f	18	30	40	55	38	20	16

- 15 (a) Show that the sample mean $\bar{X}$ is an unbiased estimator of parameter θ .
(b) Show that the sample variance is not unbiased estimator of population variance.

5M

5M

OR

- 16 A random sample of 900 was taken from a population whose mean is 35 with standard deviation of 10. Find maximum error and also construct 95% confidence interval for true average.

10M

- 17 A manufacturer claims that his synthetic fishing line has a mean breaking strength of 8kg and S.D 0.5kg. Can we accept his claim if a random sample of 50 lines yield a mean breaking of 7.8kg. Use 1% level of significance.

10M

OR

- 18 A wholesaler received a shipment of goods, which is reported to be containing at most 2% defective items. He will accept the shipment if the claim is found true and reject if the percentage of defective items is more. To verify this claim, he draws a sample of 200 items and finds that 10 items are defective. What should be his decision at 5% level of significance?

10M

- 19 The following are the numbers of mistakes made in 5 successive days of 4 technicians working for a photographic laboratory:

10M

Technician I	Technician II	Technician III	Technician IV
6	14	10	9
14	9	12	12
10	12	7	8
8	10	15	10
11	14	11	11

Test at the level of significance $\alpha = 0.01$, whether the differences among the 4-sample means, can be attributed to chance.

OR

- 20 Ten entries are submitted for a competition. Three judges study each entry and list the ten in rank order. Their rankings are as follows:

Entry:	A	B	C	D	E	F	G	H	I	J
Judge J1:	9	3	7	5	1	6	2	4	10	8
Judge J2:	9	1	10	4	3	8	5	2	7	6
Judge J3:	6	3	8	7	2	4	1	5	9	10

10M

Calculate the appropriate rank correlation to help you answer the following questions:

- (i) Which pair of judges agrees the most? (ii) Which pair of judges disagrees the most?