



UNIVERSITY OF ENGINEERING AND MANAGEMENT, KOLKATA

Degree: B.Tech

Stream: CSE

Year: 3<sup>rd</sup>

Even Semester Term - I Examination, February - 2024

Subject Code: PECCSE602A

Subject Name: Professional Elective III: Data Analytics

Full Marks: 30

Duration: 1 Hour

Date: 28.02.2024

Time: 4 PM – 5 PM

**Part - A**

**Attempt 5 questions**

**Each question carries 2 marks (2 × 5)**

1. What is the difference between data and information?

**or**

Differentiate Cross-section, Time-series Data, and Panel Data.

2. The monthly sales for 12 months in a supermarket are given in the following Table:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
438	247	529	320	210	653	683	300	230	257	457	230

Find the average monthly sales for Jan to Jun and the average sale for Jul to Dec. The manager claims that the second half is better than the first half. Is he right?

**or**

Find the mean of the distribution given in the following table:

Value	3	5	7	11	13	16	9
Frequency	4	3	1	7	3	6	2

3. Find the median of the distribution given in the following table:

Value	1	2	3	4	5	6	7	8	9
Frequency	16	20	22	32	40	50	30	18	12

**or**

The ages of residents of an old-age home have distribution as given in the following table. Find the mode of the distribution.

Age	Frequency
47-52	4
52-57	9
57-62	13
62-67	42
67-72	39
72-77	20
77-82	9



4. State Baye's theorem.

or

State the probability mass function of Binomial Distribution.

5. Compare stratified random sampling and cluster sampling.

or

Compare convenience sampling and snowball sampling.

### Part - B

Attempt 2 questions

Each question carries 5 marks ( $5 \times 2$ )

6. Categorize and briefly describe all types of data.

or

Distinguish skewness and kurtosis using example.

7. Usually, 25% of the candidates who appear for interview for the post of assistants in the nationalized bank are selected for recruitment. If 25 candidates who are going to appear for interview are randomly selected, find the probability that:

(a) Exactly 12 will be rejected.

(b) Fewer than 3 will be rejected.

or

The quality control manager finds the average number of defective parts coming out in a production cycle is 5. Find the probability that:

(a) Exactly 5 parts are defective in a production cycle.

(b) More than 4 parts are defective

### Part - C

Attempt 1 question

Each question carries 10 marks ( $10 \times 1$ )

8. An automatic filling machine has to fill eyedrops with a mean of 10 ml per bottle. Both overfilling and underfilling are not desirable. A quality control inspector takes sample of 30 bottles in every half an hour in order to decide whether he has to stop operation in the case of overfilling and underfilling beyond a certain level for adjusting the machine. If the sample has a mean of 9.8 ml with a standard deviation of 0.5 ml. give the decision rule for the quality control inspector, taking 0.05 as the significance level.

or

Find out the test type and give the rejection rule for the following data:

- |                        |               |        |
|------------------------|---------------|--------|
| (a) $H_1: \mu \neq 45$ | $\alpha=0.05$ | $n=30$ |
| (b) $H_1: \mu < 45$    | $\alpha=0.05$ | $n=30$ |
| (c) $H_1: \mu > 45$    | $\alpha=0.05$ | $n=30$ |
| (d) $H_1: \mu \neq 45$ | $\alpha=0.02$ | $n=40$ |
| (e) $H_1: \mu > 45$    | $\alpha=0.01$ | $n=50$ |

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