

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS: MBA/PRE-PHD  
BRANCH: MANAGEMENT**

**SEMESTER : I  
SESSION : MO/2025**

**SUBJECT: MT421 DATA ANALYSIS AND DECISION TOOLS**

**TIME: 3 Hours**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) A Manufacture who produces medicine bottles, finds that 0.1% bottles are defective. The bottles are packed in boxes containing 500 bottles. A retailer buys 100 boxes. Find how many boxes will contain, [5] CO 4 BL 4
- (i) No defective.  
(ii) At least 2 defectives.

- Q.1(b) There are 10 parts in a bin, out of which 3 parts are defective. From the bin, 2 parts are selected at random without replacement. If X is a random variable which represents the count of defective items selected. Create probability distribution table of X? Write a function to describe the probability distribution of X. [5] 4 5

- Q.2(a) For the following data, Calculate the Arithmetic Mean, First Quartile, and Median [5] 1 3
- | Income      | No. of Employees | Income      | No. of Employees |
|-------------|------------------|-------------|------------------|
| 1300 -1399  | 30               | 1700 - 1799 | 60               |
| 1400 - 1499 | 46               | 1800 - 1899 | 50               |
| 1500 - 1599 | 58               | 1900 - 1999 | 20               |
| 1600 - 1699 | 76               |             |                  |

- Q.2(b) For the data provide in Q.2(a) Calculate the Coefficient of variation [5] 1 3

- Q.3(a) Write notes on the following [5] 3 3
- (i) Sampling and Sampling Methods  
(ii) Random Variable and Probability distribution

- Q.3(b) In the following table are recorded data showing the test scores made by salesmen on an intelligence test and their weekly sales: [5] 3 4

Salesmen	1	2	3	4	5	6	7	8	9	10	
Capital (Cr)	10	20	30	40	50	60	70	80	90	100	
Profit (Cr)	2	4	8	5	10	15	14	20	22	50	

Find the Karl Pearson's Correlation Coefficient and write your interpretation.

- Q.4(a) Write notes on the following [5] 2 3
- (i) One way ANOVA  
(ii) Point Estimation and Interval Estimation

- Q.4(b) In a training program some students were trained by Method A, and Others were by Method B. Following data represents the sample data collected about productivity from the training program. [5] 2 4

Method A	71	75	65	69	73	66	68	71	74	68
Method B	72	77	84	78	69	70	77	73	65	75

Test the claim that Method B is more effective than Method A. Use 5% significance.

**PTO**

Q.5(a) For the following data,

[5] 5 4

Experience (Years)	10	12	6	8	10	6	2	5
Salary (Rs'000)	25	28	17	19	24	18	13	16

Develop a linear regression equation and estimate the salary of a person with 13 years of experience.

Q.5(b) To understand the primary source of news for households in a locality, a survey was conducted. The Results are presented in the below table. [5] 5 5

Age Group			
Media	Under 35 years	35-50 years	50 years
Local TV	107	119	133
National TV	73	102	127
Radio	75	97	109
Local Newspaper	52	79	107
Internet	95	83	76

At a 0.05 level of significance is there evidence of a significant relationship between age group and their primary source of news.

:::::28/11/2025:::::E