

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI**  
(MID SEMESTER EXAMINATION SP/2024)

CLASS: BTECH  
BRANCH: P&IE

SEMESTER :  
SESSION : SP/2024

**SUBJECT: PE221 QUANTITATIVE TECHNIQUES**

TIME: 02 Hours

FULL MARKS: 25

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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|---|---------|---------|---------|
| Q.1 Develop box plot based on the data set given bellow. Clearly mention Q1, Q2, Q3 in the boxplot. Does there exist any outlier in the data?<br>42;65;32;83;107;55;24;41;60;29;17;34;46;68;9;50;16;31;36;45;9;33;77;57   | [5]     | CO<br>1 | BL<br>3 |
| Q.2(a) What do you mean by primary data source and secondary data source?   | [2]     | 2       | 2       |
| Q.2(b) Describe various types of estimators and the situations under which they may be used.  | [3]     | 2       | 2       |
| Q.3 Write short notes on any TWO of the following:<br>(a) Systematic Sampling, (b) Judgmental Sampling, (c) Convenience Sampling  | [2.5x2] | 2       | 2       |
| Q.4 “Thaggu ka laddu”, a famous sweet manufacturer in Kanpur wishes to understand if there exist any relation between the buying behavior of the customers and their age. They have made a year-wide survey to find out the age of the customers (who visited more than once in any of their outlet) and total number of visits they made to their various outlets in Kanpur within a year. The survey result is given bellow. Use correlation analysis to identify if there exist any relationship between the two variables stated above. | [5]     | 3       | 3       |
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- | Customer no. | Age | No of times customer visited the shop in a year |
|--------------|-----|---|
| 1            | 73  | 151   |
| 2            | 55  | 3   |
| 3            | 48  | 58  |
| 4            | 58  | 6   |
| 5            | 47  | 46  |
| 6            | 64  | 7   |
| 7            | 56  | 14  |
| 8            | 68  | 4   |
| 9            | 72  | 14  |
| 10           | 71  | 21  |
| 11           | 55  | 47  |
| 12           | 75  | 49  |
| 13           | 47  | 5   |
| 14           | 48  | 30  |
| 15           | 49  | 14  |
| 16           | 43  | 2   |
| 17           | 45  | 5   |
| 18           | 46  | 5   |
| 19           | 38  | 2   |
| 20           | 59  | 66  |
| 21           | 49  | 2   |
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- |  |     |   |   |
|--|-----|---|---|
| Q.5 Derive various equations for determining the regression parameters if there are 3 independent variables (X1, X2, and X3) in linear relationship. | [5] | 3 | 3 |
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