

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(MID SEMESTER EXAMINATION SP/2025)

CLASS: BTECH  
BRANCH: PIE

SEMESTER : IV  
SESSION : SP/2025

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

		CO	BL
Q.1(a) Describe different types of data based on the outcome.	[2]	1	1
Q.1(b) Calculate Median, 1 <sup>st</sup> Quarterly, 3 <sup>rd</sup> Quarterly of the data given bellow. Data Set: 55, 59, 50, 27, 55, 57, 25, 30, 34, 36, 27, 59, 51, 31, 41, 60, 64, 64, 65, 45, 44, 41, 36, 29	[3]	1	2
Q.2(a) What is primary data and census data? Provide situations when these types of data are used.	[2]	2	2
Q.2(b) What are the differences between cluster sampling and stratified sampling?	[3]	2	3
Q.3(a) What is sample error? How it is calculated?	[3]	2	2
Q.3(b) What are various types of estimators?	[2]	2	1
Q.4 Calculate the Pearson's co-efficient of correlation between X and Y in the data given below.	[5]	3	3

Y	X
141	91
118	80
43	38
120	84
105	76
120	63
48	40
48	36
15	9
25	35
85	55
55	47
127	65
91	52
131	82

- Q.5 Derive various equations for determining the co-efficients - a, b<sub>1</sub>, b<sub>2</sub>, if the non-linear regression line looks like the equation given below. [5] 3 4

$$Y = ab_1^{x_1} b_2^{x_2}$$