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

CLASS: BSC. **SEMESTER : I**
BRANCH: CHEMISTRY **SESSION : MO/2025**

SUBJECT: ED103 STATISTICAL METHODS-I

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.

			CO	BL
Q.1(a)	Construct a grouped frequency distribution for the following 20 waiting times (in minutes): 8, 12, 14, 9, 7, 11, 15, 10, 6, 13, 9, 16, 18, 11, 10, 12, 14, 20, 5, 9.	[5]	1	
Q.1(b)	For grade counts A:12, B:18, C:25, D:10, F:5, compute sector angles for a pie chart.	[5]	1	
Q.2(a)	For data 4, 6, 9, 9, 10, 12, 13, 13, 13, 15 compute mean, median and mode; comment on distribution shape.	[5]	2	
Q.2(b)	Using the following grouped table (Age 20–24:6, 25–29:14, 30–34:20, 35–39:10, 40–44:5), estimate the mean and median age:	[5]	2	

Agre group	20-24	25-29	30-34	35-39	40-44
frequency	6	14	20	10	5

Q.3(a)	For sample 7, 9, 10, 12, 12, 13 compute sample variance and standard deviation, interpret the standard deviation.	[5]	3	
Q.3(b)	Given output classes 50–59:5, 60–69:12, 70–79:18, 80–89:10, 90–99:5, estimate mean and SD, then compute the coefficient of variation; also obtain quartile deviation from the grouped cumulative distribution	[5]	3	

Agre group	50-59	60-69	70-79	80-89	90-99
frequency	5	12	18	10	5

Q.4(a)	For bivariate data (2,56), (3,62), (4,65), (5,70), (6,74), compute sample covariance s_{xy} and Pearson correlation r; interpret.	[5]	4	
Q.4(b)	Why is correlation considered a standardized measure, while covariance is not?	[5]	4	
Q.5(a)	For points (1,2), (2,3), (3,5), (4,4), (5,6), obtain OLS estimates ω_0, ω_1 and write the fitted line; interpret the slope.	[5]	5	
Q.5(b)	Perform the multiple linear regression with the following data:	[5]		

x_1	200	220	250	270	300
x_2	4	5	5	6	7
y	50	55	60	65	70

:::::20/11/2025:::::E