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

CLASS: IMSC/BSC **SEMESTER : I**
BRANCH: QEDS/CHEMISTRY **SESSION : MO/2023**

SUBJECT: ED103 STATISTICAL METHOD - 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. Graph paper to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	An incomplete frequency distribution is given as follows:	[5]	2	3

Wages	20-30	30-40	40-50	50-60	60-70
No. of workers	3	5	20	f	5

(i) Calculate how many workers earn wages between 50-60 if the median wage is 46.75? [3]
(ii) Calculate the mode wage. [2]

Q.1(b)	For the data given in Q1(a) [after calculating f], plot a histogram and frequency polygon on the given graph paper. Comment on the distribution of wages.	[5]	1	3

Q.2	Lives (in years) of two models of refrigerators are given below:	[10]	2	3

life (in years)	**Model A**	**Model B**
0-2	5	2
2-4	16	7
4-6	13	12
6-8	7	19
8-10	5	9
10-12	4	1

Which refrigerator model has higher mean life? Which model shows more consistency (less variation) in life?

Q.3	For the following data on sale (in Rs.) of product A and product B:	[10]	3	4

Sale of Product A	Sale of Product B
100	90
120	110
130	125
125	130
120	115
130	115

(i) Find the Karl Pearson's correlation coefficient and comment on the nature of the relationship. [7]
(ii) Discuss any two properties of correlation coefficient. [3]

Q.4	The Sunflowers Apparel Co. wants to see if the number of profiled customers within a fixed radius of a store impacts the annual sales of the store. The data are given below:	[10]	4	4

Profiled customers (millions)	Annual Sales ($millions)
3.7	5.7
3.6	5.9
2.8	6.7
5.6	9.5
3.3	5.4
2.2	3.5
3.3	6.2

Fit a linear regression for the data and comment on how the number of profiled customers influence the annual sales.

PTO

Q.5(a)	State the assumptions of Multiple Linear Regression (MLR) analysis.	[5]	5	2
Q.5(b)	An MLR is modeled for predicting the 'performance index' of a group of students based on their 'hours studied', 'previous scores', and 'Sample Question Papers Practiced'. The regression output is shown below:	[5]	5	4

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-30.6791741	0.106838492	-287.155	0
Hours Studied	2.853819235	0.008551005	333.7408	0
Previous Scores	1.018859684	0.001276498	798.1676	0
Sample Question Papers Practiced	0.196303105	0.007721485	25.42297	3.3E-138

(i) Interpret how 'hours studied' is influencing the performance index of the students.
(ii) Interpret how 'previous scores' is influencing the performance index of the students.

:::::12/12/2023 M:::::