LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

U.G.. DEGREE EXAMINATION – **ALLIED**

SECOND SEMESTER – **APRIL 2025**

UCO 2302 – STATISTICS FOR DECISION MAKING

Date: 05-05-2025 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 PM

	SECTION A - K1 (CO1)
	Answer ALL the Questions (10 x 1 = 10)
1.	Multiple Choice Questions:
a)	What is the formula for the arithmetic mean of a dataset? a) Sum of values / Number of values b) (Sum of values)² / Number of values c) Sum of values X Number of values d) None of the above
b)	If the correlation coefficient is 0, what does it imply? a) Perfect positive correlation b) No relationship between the variables c) Perfect negative correlation d) Data is inconsistent
c)	What is the objective of regression analysis? a) Measure the strength of the relationship b) Classify variables into groups c) Predict the value of one variable based on another d) Determine the dispersion of data
d)	Which component of a time series captures long-term trends? a) Cyclical variation b) Seasonal variation c) Trend d) Random variation
e)	What is the main objective of a transportation problem? a) Maximize total demand b) Minimize total transportation cost c) Optimize supply chain structure d) Reduce workforce
2.	Match the following
a)	Kurtosis - (i) Graphical representation of correlation
b)	Scatter Diagram - (ii) Measure of peakedness of a distribution
c)	Trend Analysis - (iii) Measures relative changes over time
d)	Index Number - (iv) Used to solve LPP with two variables
e)	Linear Programming - (v) Measures relative changes over time
	SECTION A - K2 (CO1)
	Answer ALL the Questions (10 x 1 = 10)
3.	State True or False
a)	The standard deviation is a measure of dispersion.
b)	The correlation coefficient ranges between -2 and +2.
c)	Logistic regression is used for predicting categorical outcomes.
d)	The components of a time series include trend, seasonal, cyclic, and irregular variations.
e)	The Least Cost Method selects the cell with the highest cost first.
4.	Fill in the blanks
a)	The standard deviation is the square root of the _____
b)	Spearman's rank correlation is used when data is measured on an _____ scale.
c)	The equation of a regression line is used to predict the value of a _____ variable.
d)	The ratio-to-moving average method is used to measure _____ variations.
e)	The Least Cost Method selects the cell with the _____ cost first.
	SECTION B - K3 (CO2)
Answer any TWO of the following	(2 x 10 = 20)
5.	The marks obtained by 10 students in a test are as follows: Marks: 25, 30, 35, 40, 45, 50, 50, 55, 60, and 65. a) Find the Mean of the marks b) Find the Median of the marks c) Find the Mode of the marks
6.	The following are the heights (in cm) of 8 students: Heights (in cm): 150, 155, 160, 162, 165, 168, 170, 175. Find the Quartile Deviation (Q.D.).
7.	Distinguish between Correlation and Regression.

8. Calculate Spearman's Rank Correlation Coefficient from the following data:

Subject	A's Rank	B's Rank
Maths	1	2
Science	2	3
English	3	4
History	4	1
Geography	5	5

SECTION C – K4 (CO3)

Answer any TWO of the following (2 x 10 = 20)

9. Given the following data for two variables X and Y:

X	1	2	3	4	5
Y	2	4	5	4	5

Find the regression equation of Y on X.

10. The following data represents the production of a product over ten years: Calculate 3 yearly moving average.

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Production	80	85	90	92	95	97	100	102	105	108

11. Fit a trend line by the method of semi-averages for the given data.

Year	1990	1991	1992	1993	1994	1995	1996	1997
Sales	15	11	20	10	15	25	35	30

12. Find the initial basic feasible solution for the following transportation problem by Vogel's Approximation Method (VAM).

		Distribution Centers				Availability
		D1	D2	D3	D4	
Origin	O1	2	3	11	7	6
	O2	1	0	6	1	1
	O3	5	8	15	9	10
Requirement		7	5	3	2	

SECTION D – K5 (CO4)

Answer any ONE of the following (1 x 20 = 20)

13. Compute Mean, Median and Mode for the following data:

Class Interval	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Frequency	6	8	14	18	12	7

14. Calculate the seasonal index for the quarterly production of a product using the method of simple averages.

Year	I Quarter	II Quarter	III Quarter	IV Quarter
2020	72	68	62	76
2021	78	74	78	72
2022	74	70	72	76
2023	76	74	74	72
2024	72	72	76	68

SECTION E – K6 (CO5)

Answer any ONE of the following (1 x 20 = 20)

15. Calculate Karl Pearson's coefficient of correlation from the following data:

X	12	9	8	10	11	13	7
Y	14	8	6	9	11	12	3

16. Find an initial basic feasible solution of the following problem using North West Corner rule.

		Distribution Centers				Supply
		D1	D2	D3	D4	
Origin	O1	5	3	6	2	19
	O2	4	7	9	1	37
	O3	3	4	7	5	34
Demand		16	18	31	25	

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