



UEC2AR02 – STATISTICS FOR DECISION MAKING

Date: 05-05-2025

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 PM

SECTION A - K1 & K2 (CO1)

Q.No	Levels	Answer ALL the Questions (10 x 2 = 20)
1	K1	A histogram is used to represent categorical data. (True/False)
2		The standard deviation of a data set is always a positive value. (True/False)
3		If the correlation coefficient (r) is 0, it means there is no relationship between the two variables. (True/False)
4		The moving average method is used to smooth out short-term fluctuations in time series data. (True/False)
5		In a Linear Programming Problem (LPP), the optimal solution always occurs at the center of the feasible region. (True/False)
6	K2	Find the Mode for the data 1, 5, 7, 9, 11, 4, 2, 8, 7 is (i) 7 (ii) 3 (iii) 2 (iv) 11
7		The relationship between Mean, Median, and Mode is given by: (i) $\text{Mean} = 3 \times \text{Mode} - 2 \times \text{Median}$ (ii) $\text{Mode} = 3 \times \text{Median} - 2 \times \text{Mean}$ (iii) $\text{Median} = 3 \times \text{Mode} - 2 \times \text{Mean}$ (iv) $\text{Mean} = 2 \times \text{Median} - \text{Mode}$
8		If the correlation coefficient (r) is close to -1, it indicates: (i) No correlation (ii) Weak positive correlation (iii) Strong negative correlation (iv) Perfect positive correlation
9		Which method is NOT used to measure trends in time series analysis? (i) Moving Average Method (ii) Semi-Average Method (iii) Laspeyres Index Method (iv) Least Squares Method
10		In the graphical method of Linear Programming, the feasible region is determined by: (i) The objective function only (ii) The constraints of the problem (iii) The decision variables (iv) None of the above

SECTION B – K3 & K4 (CO2)

		Answer ALL the Questions	(4 x 10 = 40)																		
11	K3	Explain the origin and development of operation research.																			
		[OR]																			
12		Calculate Spearman Rank Correlation for the following data:																			
		<table><tr><td>Student</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td></tr><tr><td>Math Marks</td><td>60</td><td>75</td><td>45</td><td>80</td><td>50</td></tr><tr><td>Science Marks</td><td>65</td><td>70</td><td>40</td><td>85</td><td>60</td></tr></table>	Student	A	B	C	D	E	Math Marks	60	75	45	80	50	Science Marks	65	70	40	85	60	
Student		A	B	C	D	E															
Math Marks	60	75	45	80	50																
Science Marks	65	70	40	85	60																
13		The marks obtained by 7 students in a test are as follows: 45, 50, 55, 60, 65, 70, 75. Find Quartile Deviation.																			
		[OR]																			
14		Classify the various diagrammatical representation of data.																			

15	K4	Elaborate the uses of Statistics.														
16		[OR] Plot the trend for the following series using Semi-Average Method <table><tr><td>Year</td><td>2017</td><td>2018</td><td>2019</td><td>2020</td><td>2021</td><td>2022</td></tr><tr><td>Production (in tonnes)</td><td>50</td><td>55</td><td>60</td><td>65</td><td>70</td><td>85</td></tr></table>	Year	2017	2018	2019	2020	2021	2022	Production (in tonnes)	50	55	60	65	70	85
Year		2017	2018	2019	2020	2021	2022									
Production (in tonnes)		50	55	60	65	70	85									
17	Compute Karl Pearson’s Correlation coefficient for the following: <table><tr><td>Hours Studied</td><td>2</td><td>3</td><td>5</td><td>7</td><td>8</td></tr><tr><td>Exam Score</td><td>50</td><td>60</td><td>70</td><td>85</td><td>90</td></tr></table>	Hours Studied	2	3	5	7	8	Exam Score	50	60	70	85	90			
Hours Studied	2	3	5	7	8											
Exam Score	50	60	70	85	90											
18	[OR] Explain the components of a Time Series.															

SECTION C – K5 & K6 (CO3)

	Answer ALL the Questions											(2 x 20 = 40)	
19	K5	Compute the three-year Moving Average for the following series.											
		Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
		Sales (Units)	120	130	125	138	145	149	159	163	170	177	
		[OR]											
20		Compute Mean Deviation for the following											
		Marks (X)	0 - 10		10 - 20		20 - 30		30 - 40		40 - 50		50 - 60
		Frequency (f)	4		6		10		8		7		5
21	K6	Compute Regression line equation of Y on X for the following information											
		Advertising Expenditure (X) (in '000)				2	3	5	6	8	9		
		Sales (Y) (in '000s)				40	50	65	70	90	95		
		[OR]											
22		A company produces two products: Product X and Product Y. The company wants to maximize profit, where the profit per unit of Product X = Rs. 4 and profit per unit of Product Y = Rs.3 The total labor available = 12 hours, where product X requires 2 hours per unit and product Y requires 3 hours per unit. The Maximum units of Product X that can be sold = 4 units. Maximum units of Product Y that can be sold = 3 units. Find maximum profit and optimal solution.											
