



Name:

Enrolment No:

UPES
Supplementary Examination, December 2023

Course: Quantitative Methods
Program: MBA ALL
Course Code: DSQT7001

Semester: III
Time : 03 hrs.
Max. Marks: 100

SECTION A
10Qx2M=20Marks

S. No.		Marks	CO
Q1	What is the purpose of correlation analysis? a. To determine causation between variables b. To establish a relationship between variables c. To identify the mean of a dataset d. To calculate the standard deviation	2	CO1
Q2	What is the primary purpose of probability theory in statistics? a. To measure the spread of data b. To predict future outcomes with certainty c. To quantify uncertainty and randomness d. To calculate the mean of a dataset	2	CO1
Q3	What does the term "standard deviation" measure? a. The average value in a dataset b. The spread or dispersion of values in a dataset c. The center point of a distribution d. The frequency of values in a dataset	2	CO1
Q4	Which measure of central tendency is most affected by extreme values? a. Mean b. Median c. Mode d. Range	2	CO1
Q5.	What is the difference between qualitative and quantitative data?	2	CO1

	<p>a. Qualitative data is measured on an ordinal scale, while quantitative data is measured on a nominal scale</p> <p>b. Qualitative data is numerical, while quantitative data is non-numerical</p> <p>c. Qualitative data is categorical, while quantitative data is numerical</p> <p>d. Qualitative data is continuous, while quantitative data is discrete</p>		
Q6.	<p>What is the primary purpose of regression analysis?</p> <p>a. To identify the mean of a dataset</p> <p>b. To predict the value of a dependent variable based on one or more independent variables</p> <p>c. To calculate the range of a dataset</p> <p>d. To establish a relationship between categorical variables</p>	2	CO1
Q7.	<p>In a perfectly symmetric dataset, where is the median located?</p> <p>a. At the mean of the dataset</p> <p>b. At the mode of the dataset</p> <p>c. Exactly at the center of the dataset</p> <p>d. At the highest value in the dataset</p>	2	CO1
Q8.	<p>In which scale of measurement is the order of categories important, but the differences between them are not meaningful?</p> <p>a. Nominal</p> <p>b. Ordinal</p> <p>c. Interval</p> <p>d. Ratio</p>	2	CO1
Q9.	<p>What does a bell-shaped curve in a histogram indicate about the data distribution?</p> <p>a. Skewed to the right</p> <p>b. Skewed to the left</p> <p>c. Symmetric distribution</p> <p>d. No clear pattern</p>	2	CO1
Q10	<p>Which type of chart is best suited for displaying trends over time?</p> <p>a. Bar chart</p> <p>b. Line chart</p> <p>c. Scatter plot</p> <p>d. Box plot</p>	2	CO1

SECTION B (Attempt Any Four)**4Qx5M= 20 Marks**

Q11	A company is analyzing the salaries of its employees. The monthly salaries (in thousands of dollars) of ten employees are: 45, 50, 55, 50, 52, 60, 70, 48, 52, and 60. Calculate the mean, median, and mode of the salaries and interpret what these measures indicate about the salary structure in the company.	5	CO2
Q12	Explain the concept of "measures of dispersion" in statistics. Provide a detailed description of two commonly used measures of dispersion and discuss when and why they are important in data analysis. Use examples or illustrations to clarify your explanation.	5	CO2
Q13	You have data on the ages of a group of 20 individuals, and you've calculated the following statistics: Mean age: 40 years, Median age: 38 years, Mode age: 35 years, Standard Deviation: 10 years a. Calculate the skewness of the age data based on the provided statistics. b. Interpret the skewness value. Does the skewness suggest that the age distribution is positively skewed, negatively skewed, or approximately symmetrical?	5	CO2
Q14	You are given five sets of data representing different scenarios. For each scenario, identify the type of correlation and specify whether it is positive, negative, or no correlation at all. Justify your answer in each case. a. Company Revenue and Advertising Spend b. Employee Training Hours and Job Performance c. Inventory Levels and Stockouts d. Customer Satisfaction and Customer Retention e. Quality Control Inspections and Defective Products	5	CO2
Q15	How descriptive statistics is different from inferential statistics. Explain with examples?	5	CO2

SECTION-C (Attempt any Three)**3Qx10M=30 Marks**

Q16	Explain the following terms with an example: Sample space, impossible events, mutually exclusive events, exhaustive events, disjoint events, certain Events.	10	CO3
-----	---	----	-----

Q17	<p>The data on heights (in inches) of 50 adult individuals in a study is given below. The data has been grouped into intervals, and the cumulative frequency.</p> <table border="1" data-bbox="391 296 1078 575"> <thead> <tr> <th>Height Interval (in inches)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>60-65</td> <td>9</td> </tr> <tr> <td>65-70</td> <td>10</td> </tr> <tr> <td>70-75</td> <td>24</td> </tr> <tr> <td>75-80</td> <td>15</td> </tr> <tr> <td>80-85</td> <td>8</td> </tr> <tr> <td>85-90</td> <td>5</td> </tr> </tbody> </table> <p>a. Create an Ogive (cumulative frequency curve) for the given data. b. Use the Ogive to find the median graphically.</p>	Height Interval (in inches)	Frequency	60-65	9	65-70	10	70-75	24	75-80	15	80-85	8	85-90	5	10	CO3
Height Interval (in inches)	Frequency																
60-65	9																
65-70	10																
70-75	24																
75-80	15																
80-85	8																
85-90	5																

Q18	<p>You have collected data on the daily temperatures in a city over the past month. The temperature data is presented in a continuous series, with the temperature ranges and their corresponding frequencies as follows:</p> <table border="1" data-bbox="407 816 1060 1136"> <thead> <tr> <th>Temp</th> <th>No. of Days</th> </tr> </thead> <tbody> <tr> <td>40-50</td> <td>5</td> </tr> <tr> <td>50-60</td> <td>8</td> </tr> <tr> <td>60-70</td> <td>12</td> </tr> <tr> <td>70-80</td> <td>7</td> </tr> <tr> <td>80-90</td> <td>4</td> </tr> </tbody> </table> <p>Calculate Standard Deviation and Coefficient of Variation</p>	Temp	No. of Days	40-50	5	50-60	8	60-70	12	70-80	7	80-90	4	10	CO3
Temp	No. of Days														
40-50	5														
50-60	8														
60-70	12														
70-80	7														
80-90	4														

Q19	<p>Calculate the correlation coefficient between price and sales from the following data and interpret the results.</p> <table border="1" data-bbox="224 1304 1122 1377"> <tbody> <tr> <td>Price (Rs)</td> <td>110</td> <td>80</td> <td>95</td> <td>92</td> <td>80</td> <td>94</td> <td>88</td> <td>90</td> </tr> <tr> <td>Sales</td> <td>5</td> <td>6</td> <td>7</td> <td>6</td> <td>7</td> <td>8</td> <td>8</td> <td>7</td> </tr> </tbody> </table>	Price (Rs)	110	80	95	92	80	94	88	90	Sales	5	6	7	6	7	8	8	7	10	CO3
Price (Rs)	110	80	95	92	80	94	88	90													
Sales	5	6	7	6	7	8	8	7													

SECTION-D (Attempt Any Two)
2Qx15M= 30 Marks

Q20	<p>You have collected data on the ages of 25 individuals in a sample group. The ages are as follows:</p> <p>42, 48, 52, 57, 60, 61, 61, 63, 64, 66, 68, 68, 69, 70, 71, 73, 74, 75, 75, 76, 78, 80, 82, 84, 87</p> <p>a. Create a frequency distribution for the ages with a class interval of 3, starting from the minimum age. Calculate the frequency for each class interval and display it in a table.</p> <p>b. Calculate the relative and percent frequency for each class interval.</p>	15	CO4
-----	---	-----------	------------

	<p>c. Plot a histogram for the data using the class intervals. Comment on the shape of the histogram and what it reveals about the distribution of ages in the sample group.</p>																												
<p>Q21</p>	<p>Case Study: Analyzing the Relationship Between Marketing Spend and Sales Performance</p> <p>Background: ABC Corporation is a company specializing in consumer electronics. The company's marketing department is responsible for promoting its products and services to customers through various advertising channels, such as online ads, television commercials, and social media campaigns. The CEO of ABC Corporation wants to understand the correlation between the marketing spending and the sales performance of their flagship product over the last year. The company's goal is to optimize marketing investments to maximize sales.</p> <p>Data: The marketing department has collected data on monthly marketing spending (in thousands of dollars) and monthly sales revenue (in thousands of dollars) for the past year.</p> <table border="1" data-bbox="321 873 1149 1329"> <thead> <tr> <th>Marketing Spend (Thousand\$)</th> <th>Sales Revenue (Thousand\$)</th> </tr> </thead> <tbody> <tr><td>25</td><td>120</td></tr> <tr><td>30</td><td>130</td></tr> <tr><td>28</td><td>125</td></tr> <tr><td>32</td><td>140</td></tr> <tr><td>35</td><td>150</td></tr> <tr><td>40</td><td>155</td></tr> <tr><td>38</td><td>150</td></tr> <tr><td>45</td><td>160</td></tr> <tr><td>50</td><td>170</td></tr> <tr><td>48</td><td>165</td></tr> <tr><td>55</td><td>180</td></tr> <tr><td>58</td><td>190</td></tr> </tbody> </table> <p>Questions:</p> <ol style="list-style-type: none"> Create a scatterplot to visualize the relationship between marketing spending and sales revenue. Based on the scatterplot, what can you infer about the relationship between these two variables? Calculate the Pearson correlation coefficient (r) between marketing spending and sales revenue. Interpret the value of r in the context of this case. Discuss the limitations of using correlation analysis in making predictions and decisions. 	Marketing Spend (Thousand\$)	Sales Revenue (Thousand\$)	25	120	30	130	28	125	32	140	35	150	40	155	38	150	45	160	50	170	48	165	55	180	58	190	<p>15</p>	<p>CO4</p>
Marketing Spend (Thousand\$)	Sales Revenue (Thousand\$)																												
25	120																												
30	130																												
28	125																												
32	140																												
35	150																												
40	155																												
38	150																												
45	160																												
50	170																												
48	165																												
55	180																												
58	190																												
<p>Q22</p>	<p>The following data relate to the scores obtained by 9 salesmen of a company in an intelligence test and their weekly sales.</p> <table border="1" data-bbox="228 1822 1235 1898"> <tr> <td>Test Score</td> <td>50</td> <td>60</td> <td>40</td> <td>60</td> <td>50</td> <td>50</td> <td>80</td> <td>40</td> <td>70</td> </tr> </table>	Test Score	50	60	40	60	50	50	80	40	70	<p>15</p>	<p>CO4</p>																
Test Score	50	60	40	60	50	50	80	40	70																				

Week ly Sales	30	60	30	50	60	30	70	50	60
---------------------	----	----	----	----	----	----	----	----	----

- a) Obtain the regression equation of sales on intelligence test scores of the salesman.
- b) If the Intelligence test score of a salesman is 75, what would be his expected weekly sales?