Reg. No.								

MBA Degree (FT/ PT) I End Semester Examination- December, 2022
21-371-0102/ 21-372-0102/20-371-0102: Statistics for Managers

(Regular and Supplementary)

Time: 3 Hours **Max Marks: 50**

Course Outcomes: On completion of the course, the student will be able to:-

CO1	Ability to recall the basic concepts and terms related to Statistics and Quantitative Techniques including Measures of central tendency, measures of Variation, Hypothesis testing and Multivariate Data Analysis.
CO2	Enable the incumbents to understand comprehensively the concepts delivered at the remembrance level to make them cognitively fit for application. They should be able to identify the right technique to be applied in a context.
CO3	Once the student has understood the right technique to be applied in a particular decision context, they should be able to apply the technique and generate results. Cases and problems sets will guide them through this process. The outcome is developing application skills in the business context.
CO4	Impart skills to analyse the real business data to explore and establish relationships in the areas of managerial decisions. Through a field projects the students will be collecting real data and analyzing them with an appropriate statistical package. This will reinforce their application skills and help them to develop an analytical mindset to try analyzing real life data with the tools studied.
CO5	Evaluate the practical implications of the results found from the analysis of data. They should be able to verify the validity of assumptions (they made) they made based on the results of the analyses performed. They can revalidate the conclusions through multiple analysis and techniques in the MVA domain and arrive at a most feasible and coherent conclusion.
CO6	Generate new ideas and solutions for business problems. The students based on the evaluation of real data come to statistical conclusions. Here they are able to convert statistical conclusions to business strategies.

BL – Bloom's Taxonomy :(L1- Remember , L2 - Understand, L3 – Apply, L4-Analyse, L5-Evaluate, L6-Create)

PART A
(Answer ALL questions. Each question carries 2 marks)

Q No.	Questions	Marks	BL	CO
1	"An average does not tell the full story. It is hardly fully representative of a mass unless we know the manner in which the individual items scatter/vary around it." Justify the statement by giving a suitable example.	2	5	1
2	Define non-parametric tests	2	2	2
3	Differentiate between weighted and unweighted index numbers.	2	4	1
4	The coefficient of variation of profits of the last 10 years for company A was found to be 11.06% and that of company B was 5.1%. What interpretation can be drawn from the given data?	2	5	4
5	List any four properties of normal distribution	2	1	3

(5X2=10 marks)

PART B

(Answer ANY FIVE Questions. Each question carries 4 marks)

<table>
<tr><th>Q No.</th><th>Questions</th><th>Marks</th><th>BL</th><th>CO</th></tr>
<tr><td>6</td><td>A manufacturer who produces medicine bottles finds that 0.1 percent of the bottles are defective. The bottles are packed in boxes containing 500 bottles. A drug manufacturer buys 100 boxes from the producer of bottles. Using Poisson distribution, find how many boxes will contain:
a) No defectives
b) At least two defectives</td><td>4</td><td>1</td><td>3</td></tr>
<tr><td>7</td><td>The average monthly electricity consumption for a sample of 100 families is 1400 units per month. Assuming that standard deviation of electricity consumption of all the 100 families is 200 units, construct a 95% confidence interval estimate of the mean electricity consumption.</td><td>4</td><td>3</td><td>4</td></tr>
<tr><td>8</td><td>The following facts are gathered before and after the settlement of an industrial dispute. Compare the position before and after in respect of:
a) Total wages
b) Coefficient of variation
<table>
<tr><th>Particulars</th><th>Before Dispute</th><th>After Dispute</th></tr>
<tr><td>Number of workers</td><td>515</td><td>509</td></tr>
<tr><td>Mean Wages (Rs.)</td><td>49.50</td><td>52.75</td></tr>
<tr><td>Median wages (Rs.)</td><td>52.80</td><td>50</td></tr>
<tr><td>Variance of Wages (Rs.)</td><td>121</td><td>144</td></tr>
</table></td><td>4</td><td>2</td><td>1</td></tr>
<tr><td>9</td><td>In 2014, a firm began downsizing in order to reduce its costs. One of the results of these cost cutting measures has been a decline in the percentage of private industry jobs. The following data show the percentage of females who were managers from 2014- 2021.
<table>
<tr><th>Year</th><td>2014</td><td>2015</td><td>2016</td><td>2017</td><td>2018</td><td>2019</td><td>2020</td><td>2021</td></tr>
<tr><th>Percentage</th><td>6.7</td><td>5.3</td><td>6.1</td><td>5.6</td><td>7.9</td><td>5.8</td><td>4.3</td><td>6.1</td></tr>
</table>
a) Develop a linear trend line for this time series.
b) Use this trend to estimate the percentage of females who will be managers in 2024.</td><td>4</td><td>3</td><td>2</td></tr>
<tr><td>10</td><td>The table below gives the data pertaining to X and Y. Compute the Pearson correlation coefficient and explain its meaning
X: 100 200 300 400 500 600
Y: 120 130 140 150 160 170</td><td>4</td><td>5</td><td>5</td></tr>
<tr><td>11</td><td>“Statistics is a tool of decision-making in the face of uncertainty on the basis of numerical data and calculated risks.” Elucidate on the importance of Statistics in real life.</td><td>4</td><td>2</td><td>1</td></tr>
</table>

<table>
<tr><th>Q No.</th><th>Questions</th><th>Marks</th><th>BL</th><th>CO</th></tr>
<tr><td>12</td><td>A movie producer is bringing out a new movie. In order to map out her advertising, she wants to determine whether the movie will appeal to a particular age group or equally to all age groups. The producer takes a random sample of persons attending the preview of the movie and obtains the following results. Use appropriate hypothesis test to derive the conclusion, at 5% significance level.
<table>
<tr><th></th><th colspan="4">Age group (in years)</th></tr>
<tr><th>Persons</th><td>Under 20</td><td>20-39</td><td>40-59</td><td>60 and above</td></tr>
<tr><td>Liking the movie</td><td>250</td><td>180</td><td>200</td><td>100</td></tr>
<tr><td>Disliking the movie</td><td>60</td><td>15</td><td>80</td><td>70</td></tr>
<tr><td>Indifferent</td><td>40</td><td>50</td><td>120</td><td>40</td></tr>
</table></td><td>4</td><td>4</td><td>3</td></tr>
</table>

(5X4=20 marks)

PART C

(Answer ANY TWO questions. Each question carries 10 marks)

<table>
<tr><th>Q No.</th><th>Questions</th><th>Marks</th><th>BL</th><th>CO</th></tr>
<tr><td>13</td><td>For the following data, calculate Laspeyre's and Paasche's:
a) Price Indices (5 marks)
b) Quantity Indices (5 marks)
<table>
<tr><th rowspan="2">Commodity</th><th colspan="2">Base year</th><th colspan="2">Current year</th></tr>
<tr><th>Price</th><th>Quantity</th><th>Price</th><th>Quantity</th></tr>
<tr><td>A</td><td>6.5</td><td>500</td><td>10.8</td><td>560</td></tr>
<tr><td>B</td><td>2.8</td><td>124</td><td>2.9</td><td>148</td></tr>
<tr><td>C</td><td>4.7</td><td>69</td><td>8.2</td><td>78</td></tr>
<tr><td>D</td><td>10.9</td><td>38</td><td>13.4</td><td>24</td></tr>
<tr><td>E</td><td>8.6</td><td>49</td><td>10.8</td><td>27</td></tr>
</table></td><td>10</td><td>4</td><td>5</td></tr>
<tr><td>14</td><td>
<table>
<tr><td>Price (Rs)</td><td>10</td><td>12</td><td>13</td><td>14</td><td>16</td><td>15</td></tr>
<tr><td>Demand (Units)</td><td>40</td><td>38</td><td>43</td><td>45</td><td>37</td><td>43</td></tr>
</table>
a) Find the regression equation of price and predict the price if the demand is 47 units. (4 marks)
b) Find the regression equation of demand and predict the demand if the price is Rs. 17 (4 marks)
c) Comment on the two regression coefficients (2 marks)</td><td>10</td><td>6</td><td>5</td></tr>
<tr><td>15</td><td>Write short notes on the following:
a) Discriminant analysis (3 marks)
b) Factor analysis (3 marks)
c) Time series components. (4 marks)</td><td>10</td><td>5</td><td>5</td></tr>
</table>

(2x10=20 marks)

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