

USN

1 C R 2 3 B A 0 7 4

First Semester MBA Degree Examination, Dec.2023/Jan.2024
Statistics for Managers

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FOUR full questions from Q.No.1 to Q.No.7.
 2. Question No. 8 is compulsory.
 3. M : Marks , L: Bloom's level , C: Course outcomes.
 4. Normal distribution, Poisson distribution table.*

			M	L	C																			
Q.1	a.	Mention the different measures of central tendency.	03	L2	CO1																			
	b.	A sample of 30 girls married early gives an average life of 55 years with a standard deviation of 10 years. From this, can we conclude at 5% significance level that the early married women live upto 60 years on a average.	07	L5	CO4																			
	c.	From the data given below find the 2 regression coefficients and 2 regression equations : <table border="1" style="margin-left: 20px;"> <tr> <td>X :</td> <td>11</td> <td>7</td> <td>9</td> <td>5</td> <td>8</td> <td>6</td> <td>10</td> </tr> <tr> <td>Y :</td> <td>10</td> <td>8</td> <td>6</td> <td>5</td> <td>9</td> <td>7</td> <td>11</td> </tr> </table>	X :	11	7	9	5	8	6	10	Y :	10	8	6	5	9	7	11	10	L3	CO2			
X :	11	7	9	5	8	6	10																	
Y :	10	8	6	5	9	7	11																	
Q.2	a.	What is favourable and exhaustive cases?	03	L4	CO3																			
	b.	The data relating to the market price of the 3 companies are as follows : <table border="1" style="margin-left: 20px;"> <tr> <td>Company</td> <td>A</td> <td>B</td> <td>C</td> </tr> <tr> <td>Average</td> <td>150</td> <td>200</td> <td>125</td> </tr> <tr> <td>Standard deviation</td> <td>50</td> <td>40</td> <td>20</td> </tr> </table> (i) Which company's share is more stable? (ii) Which one would you like to dispose of any way?	Company	A	B	C	Average	150	200	125	Standard deviation	50	40	20	07	L3	CO2							
	Company	A	B	C																				
Average	150	200	125																					
Standard deviation	50	40	20																					
c.	Two groups of 50 handicaps each were taken to study the association of blindness with deafness and the observations were tabulated as under : <table border="1" style="margin-left: 20px;"> <tr> <td>Attributes</td> <td>Blinds</td> <td>Not blind</td> <td>Total</td> </tr> <tr> <td>Deaf</td> <td>10</td> <td>40</td> <td>50</td> </tr> <tr> <td>Not deaf</td> <td>30</td> <td>20</td> <td>50</td> </tr> <tr> <td>Total</td> <td>40</td> <td>60</td> <td>100</td> </tr> </table> Using X^2 test at 5% level, verify the association of attribute.	Attributes	Blinds	Not blind	Total	Deaf	10	40	50	Not deaf	30	20	50	Total	40	60	100	10	L4	CO5				
Attributes	Blinds	Not blind	Total																					
Deaf	10	40	50																					
Not deaf	30	20	50																					
Total	40	60	100																					
Q.3	a.	Draw a scatter diagram indicating, (i) Position correlation (ii) Negative correlation (iii) No relation	03	L2	CO3																			
	b.	State the properties of regression co-efficient.	07	L2	CO3																			
	c.	8 coins are tossed 256 times. The number of heads observed at each throw are given below : <table border="1" style="margin-left: 20px;"> <tr> <td>No. of heads at each throw</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>Frequency</td> <td>2</td> <td>6</td> <td>30</td> <td>52</td> <td>67</td> <td>56</td> <td>32</td> <td>10</td> <td>1</td> </tr> </table> Find the expected frequencies using binomial distribution, mean and SD.	No. of heads at each throw	0	1	2	3	4	5	6	7	8	Frequency	2	6	30	52	67	56	32	10	1	10	L4
No. of heads at each throw	0	1	2	3	4	5	6	7	8															
Frequency	2	6	30	52	67	56	32	10	1															

Q.4	a.	What is null and alternate hypothesis?	03	L5	CO4																						
	b.	In the frequency distribution of 100 families given below, the number of families corresponding to expenditure groups 20 – 40 and 60 – 80 are missing from the table. However, the median is known to be 50. Find the missing frequencies. <table border="1" style="margin-left: 20px;"> <tr> <td>Expenditure :</td> <td>0 – 20</td> <td>20 – 40</td> <td>40 – 60</td> <td>60 – 80</td> <td>80 – 100</td> </tr> <tr> <td>No. of families</td> <td>14</td> <td>?</td> <td>27</td> <td>?</td> <td>15</td> </tr> </table>	Expenditure :	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	No. of families	14	?	27	?	15	07	L3	CO2										
Expenditure :	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100																						
No. of families	14	?	27	?	15																						
Q.5	a.	Mention the components of time series.	03	L3	CO2																						
	b.	From the pack of playing cards, one card is drawn at random. Find the probability that it is either a spade or a club.	07	L4	CO3																						
	c.	If a product has 2 defects per unit inspected, using Poisson's distribution calculate the probability of finding a product without any defects, 3 defects and 4 defects.	10	L4	CO3																						
Q.6	a.	Mention the assumptions of Karl Pearson's co-efficient of correlation.	03	L3	CO2																						
	b.	What are measures of dispersion? State the properties of an ideal measure of dispersion.	07	L3	CO2																						
	c.	The monthly income of 1000 employees are normally distributed with a mean of Rs.2500 and SD of Rs.250. Find the number of employees whose monthly income would be, (i) Between Rs.2000 and Rs.3000 (ii) Less than Rs.2000 (iii) More than Rs.3000	10	L5	CO4																						
Q.7	a.	Distinguish between mean deviation and standard deviation.	03	L3	CO2																						
	b.	From the following data, find the value of upper quartile, third decile and 90 th percentile: <table border="1" style="margin-left: 20px;"> <tr> <td>x</td> <td>0 – 10</td> <td>10 – 20</td> <td>20 – 30</td> <td>30 – 40</td> <td>40 – 50</td> <td>50 – 60</td> <td>60 – 70</td> </tr> <tr> <td>f</td> <td>5</td> <td>15</td> <td>10</td> <td>25</td> <td>20</td> <td>18</td> <td>7</td> </tr> </table>	x	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	f	5	15	10	25	20	18	7	07	L3	CO2						
x	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70																				
f	5	15	10	25	20	18	7																				
	c.	A box contains 8 red and 5 white balls. Two successive draws of 3 balls are made at random. Find the probability that the first three are white and the second three are red (i) when there is replacement and (ii) when there is no replacement.	10	L4	CO3																						
Q.8	a.	From the following data, calculate Karl Pearson's co-efficient of correlation : <table border="1" style="margin-left: 20px;"> <tr> <td>X</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>Y</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> </tr> </table>	X	1	2	3	4	5	Y	6	7	8	9	10	10	L3	CO2										
	X	1	2	3	4	5																					
Y	6	7	8	9	10																						
	b.	From the following data related to the marks assigned by the two judges, calculate the Spearman's co-efficient of rank correlation. <table border="1" style="margin-left: 20px;"> <tr> <td>Judge I</td> <td>26</td> <td>25</td> <td>38</td> <td>37</td> <td>41</td> <td>45</td> <td>60</td> <td>42</td> <td>53</td> <td>57</td> </tr> <tr> <td>Judge II</td> <td>52</td> <td>25</td> <td>30</td> <td>35</td> <td>48</td> <td>77</td> <td>38</td> <td>43</td> <td>68</td> <td>64</td> </tr> </table>	Judge I	26	25	38	37	41	45	60	42	53	57	Judge II	52	25	30	35	48	77	38	43	68	64	10	L3	CO2
Judge I	26	25	38	37	41	45	60	42	53	57																	
Judge II	52	25	30	35	48	77	38	43	68	64																	

FIRST SEMESTER MBA DEGREE EXAMINATION,

DEC 2023/ JAN 2024

STATISTICS FOR MANAGERS

Q.no	Sec	Description	Marks
1	A	Different measures of Central Tendency → Mean → Median → Mode	3 Marks
	B	Small Sample = Two Tail Test = 95% Confidence Level H0: There is no sig diff between the early age married with woman live up to 60 Years H1: There is no sig diff between the early age married with woman live up to 60 Years t Calculated Value = 0.25 Table Value = 1.96 Calculated Value is less than Table Hence H0 is accepted.	7 Marks
	C	X on Y $X = 0.256 + .81Y$ Y on X $Y = 0.879 + .489$	10 Marks
2	A	Favorable and Exhaustive Cases In probability, favorable events are outcomes that satisfy the conditions of an event. They are the number of outcomes that result in the desired event happening.	3 Marks

		exhaustive events are a set of outcomes that together cover all possible outcomes of a random experiment.	
	B	(i) C is more stable in comparison of A and B (ii) B can be disposed.	7 Marks
	C	H ₀ : There is no association between the Blind with Deaf. H ₁ : There is a association between the Blind and Deaf. Two Tail Test @ 95% Confidence Level Df = (2-1)(2-1) = 1 = tv = 9.16 CV = 7.65 & TV = 9.16 H ₀ is Accepted.	10 Marks
3	A	Positive Correlation = Value will be close to +1 dots will be close by No Relation = Dots will be very far	3 Marks
	B	Properties of Regression 1. The regression coefficient is denoted by b. 2. We express it in the form of an original unit of data. 3. The regression coefficient of y on x is denoted by b _{yx} . The regression coefficient of x on y is denoted by b _{xy} . 4. If one regression coefficient is greater than 1, then the other will be less than 1. 5. They are not independent of the change of scale. There will be change in the regression coefficient if x and y are multiplied by any constant.	7 Marks

		<p>6. AM of both regression coefficients is greater than or equal to the coefficient of correlation.</p> <p>7. GM between the two regression coefficients is equal to the correlation coefficient.</p> <p>8. If b_{xy} is positive, then b_{yx} is also positive and vice versa.</p>	
	C	<p>Frequencies are as follows: 5/ 7/ 25/ 50/ 65/ 50/ 30/ 10/ 1</p> <p>Mean = 40 & SD = 6.23</p>	10 Marks
4	A	<p>Null and Alternate Hypothesis</p> <p>Null = Never creates any difference between two variables</p> <p>Alternate = Creates difference between two variables</p>	3 Marks
	B	<p>F1 = 20</p> <p>F2 = 24</p>	7 Marks
	C	<p>Trend Value</p> <p>2016 = 25</p> <p>2017 = 30</p> <p>2018 = 35</p> <p>2019 = 40</p> <p>2020 = 45</p> <p>2021 = 50</p> <p>2022 = 55</p> <p>2023 = 60</p>	10 Marks
5	A	<p>Components of Time Series</p> <ul style="list-style-type: none"> → Trend → Seasonality → Ratio to trend → Moving averages 	3 Marks
	B	<p>P (Spade or Club) = $\frac{26}{52} = \frac{1}{2}$</p>	7 Marks

	C	No Defect = 0.24 3 Defects = 0.18 4 Defects = 0.14	10 Marks
6	A	Assumptions of Karl Pearsons Coefficient of Correlation → Linearity → Normal Distribution → Continuous Scale → No Outliers	3 Marks
	B	Measures of Dispersion are as follows: → Skewness → Kurtosis → Range → SD → Variance → Mean Deviation Properties of an Ideal Measure of Dispersion <ul style="list-style-type: none"> • It should be easy to calculate and simple to understand. • It should be based on all the observations of the series. • It should be rigidly defined. • It should not be affected by extreme values. • It should not be unduly affected by sampling fluctuations. 	7 Marks
	C	(i) 540 (ii) 260 (iii) 200	10 Marks
7	A	Mean Deviation and Standard Deviation Calculates the average deviation of a data set from its mean value. It uses absolute values instead of squares	3 Marks

		<p>to avoid negative differences between data points and their means.</p> <p>Measures how far data values are spread out from the mean value. It's calculated by adding the squares of the differences between each observation and the mean, since adding the differences themselves would result in a sum of zero.</p>	
	B	<p>$Q1 = 12$</p> <p>$D3 = 21$</p> <p>$P90 = 62$</p>	7 Marks
	C	<p>$P(\text{With Replacement}) = 5/13$</p> <p>$P(\text{Without Replacement}) = 2/13$</p>	10 Marks
8	A	<p>Correlation = 1</p> <p>Perfectly Positive Correlation</p>	10 Marks
	B	<p>Correlation = 0.53</p> <p>There is a moderate degree of positive correlation between the two variables.</p>	10 Marks