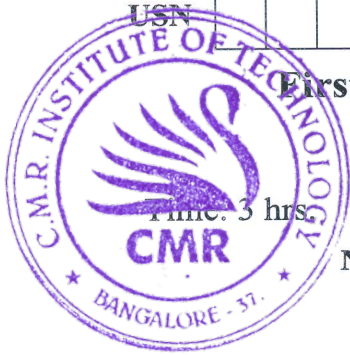


CBCS SCHEME

22MBA14



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

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. Use of Statistical Tables may be permitted.
 4. M : Marks, L: Bloom's level, C: Course outcomes.

			M	L	C																						
Q.1	a.	Classify the importance of statistics.	03	L2	CO1																						
	b.	Find the 3 rd quartile, quartile deviation and coefficient of quartile deviation. <table border="1" style="width: 100%; margin-top: 5px;"> <tr> <td style="width: 15%;">Wages (in Rs.)</td> <td style="width: 10%;">30-40</td> <td style="width: 10%;">40-50</td> <td style="width: 10%;">50-60</td> <td style="width: 10%;">60-70</td> <td style="width: 10%;">70-80</td> <td style="width: 10%;">80-90</td> <td style="width: 10%;">90-100</td> </tr> <tr> <td>Number of persons</td> <td style="text-align: center;">1</td> <td style="text-align: center;">3</td> <td style="text-align: center;">11</td> <td style="text-align: center;">21</td> <td style="text-align: center;">43</td> <td style="text-align: center;">21</td> <td style="text-align: center;">9</td> </tr> </table>	Wages (in Rs.)	30-40	40-50	50-60	60-70	70-80	80-90	90-100	Number of persons	1	3	11	21	43	21	9	07	L3	CO2						
Wages (in Rs.)	30-40	40-50	50-60	60-70	70-80	80-90	90-100																				
Number of persons	1	3	11	21	43	21	9																				
	c.	From the prices x and y of shares A and B respectively given below, state which share is more stable in value? Interpret. <table border="1" style="width: 100%; margin-top: 5px;"> <tr> <td style="width: 15%;">Price of share A, X</td> <td style="width: 5%;">55</td> <td style="width: 5%;">54</td> <td style="width: 5%;">52</td> <td style="width: 5%;">53</td> <td style="width: 5%;">56</td> <td style="width: 5%;">58</td> <td style="width: 5%;">52</td> <td style="width: 5%;">50</td> <td style="width: 5%;">51</td> <td style="width: 5%;">49</td> </tr> <tr> <td>Price of share B, Y</td> <td style="text-align: center;">108</td> <td style="text-align: center;">107</td> <td style="text-align: center;">105</td> <td style="text-align: center;">105</td> <td style="text-align: center;">106</td> <td style="text-align: center;">107</td> <td style="text-align: center;">104</td> <td style="text-align: center;">103</td> <td style="text-align: center;">104</td> <td style="text-align: center;">101</td> </tr> </table>	Price of share A, X	55	54	52	53	56	58	52	50	51	49	Price of share B, Y	108	107	105	105	106	107	104	103	104	101	10	L3	CO2
Price of share A, X	55	54	52	53	56	58	52	50	51	49																	
Price of share B, Y	108	107	105	105	106	107	104	103	104	101																	
Q.2	a.	Distinguish between correlation and regression.	03	L4	CO2																						
	b.	From the following table solve the coefficient of correlation by Karl Pearson's method. <table border="1" style="width: 100%; margin-top: 5px;"> <tr> <td style="width: 5%;">X</td> <td style="width: 5%;">6</td> <td style="width: 5%;">2</td> <td style="width: 5%;">10</td> <td style="width: 5%;">4</td> <td style="width: 5%;">8</td> </tr> <tr> <td>Y</td> <td style="text-align: center;">9</td> <td style="text-align: center;">11</td> <td style="text-align: center;">5</td> <td style="text-align: center;">8</td> <td style="text-align: center;">7</td> </tr> </table>	X	6	2	10	4	8	Y	9	11	5	8	7	07	L3	CO2										
	X	6	2	10	4	8																					
Y	9	11	5	8	7																						
c.	From the following data, calculate the rank correlation coefficient after making adjustment for tied ranks and interpret. <table border="1" style="width: 100%; margin-top: 5px;"> <tr> <td style="width: 5%;">X</td> <td style="width: 5%;">48</td> <td style="width: 5%;">33</td> <td style="width: 5%;">40</td> <td style="width: 5%;">9</td> <td style="width: 5%;">16</td> <td style="width: 5%;">16</td> <td style="width: 5%;">65</td> <td style="width: 5%;">24</td> <td style="width: 5%;">16</td> <td style="width: 5%;">57</td> </tr> <tr> <td>Y</td> <td style="text-align: center;">13</td> <td style="text-align: center;">13</td> <td style="text-align: center;">24</td> <td style="text-align: center;">6</td> <td style="text-align: center;">15</td> <td style="text-align: center;">4</td> <td style="text-align: center;">20</td> <td style="text-align: center;">9</td> <td style="text-align: center;">6</td> <td style="text-align: center;">19</td> </tr> </table>	X	48	33	40	9	16	16	65	24	16	57	Y	13	13	24	6	15	4	20	9	6	19	10	L3	CO2	
X	48	33	40	9	16	16	65	24	16	57																	
Y	13	13	24	6	15	4	20	9	6	19																	
Q.3	a.	Explain the rules of probability.	03	L2	CO3																						
	b.	The number of defects per unit in a sample of 330 units of manufactured products was given below. Estimate Poisson distribution to the data given: [$e^{-0.439} = 0.6447$]. <table border="1" style="width: 100%; margin-top: 5px;"> <tr> <td style="width: 25%;">No. of defects</td> <td style="width: 10%;">0</td> <td style="width: 10%;">1</td> <td style="width: 10%;">2</td> <td style="width: 10%;">3</td> <td style="width: 10%;">4</td> </tr> <tr> <td>No. of units</td> <td style="text-align: center;">214</td> <td style="text-align: center;">92</td> <td style="text-align: center;">20</td> <td style="text-align: center;">3</td> <td style="text-align: center;">1</td> </tr> </table>	No. of defects	0	1	2	3	4	No. of units	214	92	20	3	1	07	L5	CO3										
No. of defects	0	1	2	3	4																						
No. of units	214	92	20	3	1																						
	c.	The heights of mothers and daughters are given in the following table. From the tables of regression, estimate the expected average height of daughter when the height of the mother is 64.5 inch. Interpret. <table border="1" style="width: 100%; margin-top: 5px;"> <tr> <td style="width: 40%;">Height of mother, X in inches</td> <td style="width: 5%;">62</td> <td style="width: 5%;">63</td> <td style="width: 5%;">64</td> <td style="width: 5%;">64</td> <td style="width: 5%;">65</td> <td style="width: 5%;">66</td> <td style="width: 5%;">68</td> <td style="width: 5%;">70</td> </tr> <tr> <td>Height of daughter, Y in inches</td> <td style="text-align: center;">64</td> <td style="text-align: center;">65</td> <td style="text-align: center;">61</td> <td style="text-align: center;">69</td> <td style="text-align: center;">67</td> <td style="text-align: center;">68</td> <td style="text-align: center;">71</td> <td style="text-align: center;">65</td> </tr> </table>	Height of mother, X in inches	62	63	64	64	65	66	68	70	Height of daughter, Y in inches	64	65	61	69	67	68	71	65	10	L3	CO2				
Height of mother, X in inches	62	63	64	64	65	66	68	70																			
Height of daughter, Y in inches	64	65	61	69	67	68	71	65																			
Q.4	a.	Dissect Time Series Analysis and its uses.	03	L4	CO4																						
	b.	Explain the objectives and components of time series analysis.	07	L4	CO4																						

	c.	You have been provided with the figures of production (in 000's tons) of sugar factory. <table border="1"> <thead> <tr> <th>Year</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> <th>2020</th> <th>2021</th> <th>2022</th> </tr> </thead> <tbody> <tr> <td>Production</td> <td>77</td> <td>88</td> <td>94</td> <td>85</td> <td>91</td> <td>98</td> <td>90</td> </tr> </tbody> </table> <p>(i) Fit a straight line and apply the method of Least Square and find trend value. (ii) What is the yearly increase in production? (iii) Estimate production in 2023.</p>	Year	2016	2017	2018	2019	2020	2021	2022	Production	77	88	94	85	91	98	90	10	L5	CO4																			
Year	2016	2017	2018	2019	2020	2021	2022																																	
Production	77	88	94	85	91	98	90																																	
Q.5	a.	Dissect Hypothesis Testing.	03	L4	CO4																																			
	b.	Explain the procedure of hypothesis testing.	07	L5	CO4																																			
	c.	Estimate the seasonal index for the following data assuming that there is no need to adjust the data for the trend. [Simple average method] <table border="1"> <thead> <tr> <th>Quarter</th> <th>2017</th> <th>2018</th> <th>2019</th> <th>2020</th> <th>2021</th> <th>2022</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3.5</td> <td>3.5</td> <td>3.5</td> <td>4.0</td> <td>4.1</td> <td>4.2</td> </tr> <tr> <td>2</td> <td>3.9</td> <td>4.1</td> <td>3.9</td> <td>4.6</td> <td>4.4</td> <td>4.6</td> </tr> <tr> <td>3</td> <td>3.4</td> <td>3.7</td> <td>3.7</td> <td>3.8</td> <td>4.2</td> <td>4.3</td> </tr> <tr> <td>4</td> <td>3.6</td> <td>4.8</td> <td>4.0</td> <td>4.5</td> <td>4.5</td> <td>4.7</td> </tr> </tbody> </table>	Quarter	2017	2018	2019	2020	2021	2022	1	3.5	3.5	3.5	4.0	4.1	4.2	2	3.9	4.1	3.9	4.6	4.4	4.6	3	3.4	3.7	3.7	3.8	4.2	4.3	4	3.6	4.8	4.0	4.5	4.5	4.7	10	L5	CO4
Quarter	2017	2018	2019	2020	2021	2022																																		
1	3.5	3.5	3.5	4.0	4.1	4.2																																		
2	3.9	4.1	3.9	4.6	4.4	4.6																																		
3	3.4	3.7	3.7	3.8	4.2	4.3																																		
4	3.6	4.8	4.0	4.5	4.5	4.7																																		
Q.6	a.	Explain the method of estimating trends.	03	L4	CO4																																			
	b.	Fit a binomial distribution to the following data and interpret. <table border="1"> <thead> <tr> <th>x</th> <th>0</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>f</td> <td>28</td> <td>62</td> <td>46</td> <td>10</td> <td>4</td> </tr> </tbody> </table>	x	0	1	2	3	4	f	28	62	46	10	4	07	L3	CO3																							
x	0	1	2	3	4																																			
f	28	62	46	10	4																																			
	c.	The sales data of an item in six shops before and after a special promotional campaign are as under: <table border="1"> <thead> <tr> <th>Shops</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>E</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>Before campaign</td> <td>53</td> <td>28</td> <td>31</td> <td>48</td> <td>50</td> <td>42</td> </tr> <tr> <td>After campaign</td> <td>58</td> <td>29</td> <td>30</td> <td>55</td> <td>56</td> <td>45</td> </tr> </tbody> </table> <p>Can the campaign be judged to be a success? Test at 5% level of significance. Interpret.</p>	Shops	A	B	C	D	E	F	Before campaign	53	28	31	48	50	42	After campaign	58	29	30	55	56	45	10	L5	CO4														
Shops	A	B	C	D	E	F																																		
Before campaign	53	28	31	48	50	42																																		
After campaign	58	29	30	55	56	45																																		
Q.7	a.	Explain the term "cyclical component of a time series".	03	L2	CO4																																			
	b.	Calculate three yearly moving averages for the following data and comment on the results: <table border="1"> <thead> <tr> <th>Year</th> <th>2010</th> <th>2011</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>242</td> <td>250</td> <td>252</td> <td>249</td> <td>253</td> <td>251</td> <td>257</td> <td>260</td> <td>265</td> <td>262</td> </tr> </tbody> </table>	Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Y	242	250	252	249	253	251	257	260	265	262	07	L5	CO4													
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019																														
Y	242	250	252	249	253	251	257	260	265	262																														
	c.	Estimate seasonal indices by the Ratio to Moving Average Method from the following data of the sales (y) of a firm in lakhs of rupees. <table border="1"> <thead> <tr> <th>Year</th> <th>I Quarter</th> <th>II Quarter</th> <th>III Quarter</th> <th>IV Quarter</th> </tr> </thead> <tbody> <tr> <td>2001</td> <td>68</td> <td>62</td> <td>61</td> <td>63</td> </tr> <tr> <td>2002</td> <td>65</td> <td>58</td> <td>66</td> <td>61</td> </tr> <tr> <td>2003</td> <td>68</td> <td>63</td> <td>63</td> <td>67</td> </tr> </tbody> </table>	Year	I Quarter	II Quarter	III Quarter	IV Quarter	2001	68	62	61	63	2002	65	58	66	61	2003	68	63	63	67	10	L5	CO4															
Year	I Quarter	II Quarter	III Quarter	IV Quarter																																				
2001	68	62	61	63																																				
2002	65	58	66	61																																				
2003	68	63	63	67																																				
Q.8		The hourly wages of 1000 workmen are normally distributed around a mean of Rs.70 and with a standard deviation of Rs.5. Estimate the number of workers whose hourly wages will be (i) Between Rs.69 and Rs.72 (ii) More than Rs.75 (iii) Less than Rs.63 (iv) Also estimate the lowest hourly wages of the 100 highest paid workers.	20	L5	CO3																																			