



# CBCS SCHEME

22MBA14

## First Semester MBA Degree Examination, Dec.2025/Jan.2026 Statistics for Managers

Time: 3 hrs.

Max. Marks:100

- Note:** 1. Answer any **FOUR** full questions from Q1 to Q7.  
2. Question No.8 is compulsory.  
3. M : Marks , L: Bloom's level , C: Course outcomes.

		M	L	C																																				
1	a. Define Correlation. Mention types of correlation.	3	L1	CO1																																				
	b. In a class there are 40 boys and 30 girl students. Four students are selected at random. Find the probability of the selected students. i) None are boys ii) All are boys iii) At most 2 are boys, using binomial distribution.	7	L2	CO3																																				
	c. A company's past record shows the following data relating to sales revenue and expenses on advertising for six years. Both sales and expenses are in crores. <table border="1" style="margin: 10px auto;"> <tr><td>Year</td><td>2011</td><td>2012</td><td>2013</td><td>2014</td><td>2015</td><td>2016</td></tr> <tr><td>Sales</td><td>125</td><td>132</td><td>145</td><td>150</td><td>160</td><td>170</td></tr> <tr><td>Expenses</td><td>15</td><td>16</td><td>20</td><td>21</td><td>23</td><td>25</td></tr> </table> Estimate sales revenue if budget for expenses on ads is 30 crores. Also estimate amount to be spent on advertising if sales target is 200 crores.	Year	2011	2012	2013	2014	2015	2016	Sales	125	132	145	150	160	170	Expenses	15	16	20	21	23	25	10	L2	CO2															
Year	2011	2012	2013	2014	2015	2016																																		
Sales	125	132	145	150	160	170																																		
Expenses	15	16	20	21	23	25																																		
2	a. Mention the types of error in hypothesis testing.	3	L1	CO1																																				
	b. If two regression equations are given as $3X + 2Y = 26$ and $6X + Y = 31$ . Find : i) Mean values of X and Y ii) Regression coefficients iii) Correlation coefficient.	7	L2	CO2																																				
	c. Using 3 year and 5 year moving average calculate trend values for the following data : <table border="1" style="margin: 10px auto;"> <tr><td>Year</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>Value</td><td>130</td><td>127</td><td>124</td><td>135</td><td>140</td><td>132</td><td>129</td><td>127</td></tr> <tr><td>Year</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td></td></tr> <tr><td>Value</td><td>145</td><td>158</td><td>153</td><td>146</td><td>145</td><td>164</td><td>170</td><td></td></tr> </table>	Year	1	2	3	4	5	6	7	8	Value	130	127	124	135	140	132	129	127	Year	9	10	11	12	13	14	15		Value	145	158	153	146	145	164	170		10	L2	CO3
Year	1	2	3	4	5	6	7	8																																
Value	130	127	124	135	140	132	129	127																																
Year	9	10	11	12	13	14	15																																	
Value	145	158	153	146	145	164	170																																	

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3	a.	Which are the measures of dispersion used in descriptive statistics?	3	L1 CO1																										
	b.	A company produces tyres, tyre life is normally distributed. The mean life is found to be 40,000 kms. And S.D is 3000 kms. A new process is introduced to produce better tyres. A sample of 100 tyres are taken with a mean life of 40900 kms. Is the new tyre significantly better than the old tyre. Test at 1% level of significance $Z_{table 1\%} = 2.33$ (one-tailed).	7	L3 CO3																										
	c.	A partly reproduced frequency distribution is given below : <table border="1" style="margin: 10px auto;"> <tr><td>Marks</td><td>30-35</td><td>35-40</td><td>40-45</td><td>45-50</td><td>50-55</td><td>55-60</td><td>60-65</td></tr> <tr><td>No.of students</td><td>3</td><td>5</td><td>-</td><td>18</td><td>-</td><td>4</td><td>2</td></tr> </table> If modal marks of 60 students is given to be 47.5. Find the missing frequencies. Also calculate Mean and Median.	Marks	30-35	35-40	40-45	45-50	50-55	55-60	60-65	No.of students	3	5	-	18	-	4	2	10	L2 CO2										
Marks	30-35	35-40	40-45	45-50	50-55	55-60	60-65																							
No.of students	3	5	-	18	-	4	2																							
4	a.	Mention the properties of binomial distribution.	3	L1 CO3																										
	b.	Calculate Spear Man's rank correlation coefficient for the following data : <table border="1" style="margin: 10px auto;"> <tr><td>X</td><td>10</td><td>18</td><td>80</td><td>54</td><td>49</td><td>29</td><td>32</td><td>20</td><td>35</td><td>48</td><td>64</td><td>15</td></tr> <tr><td>Y</td><td>52</td><td>41</td><td>36</td><td>39</td><td>41</td><td>52</td><td>41</td><td>51</td><td>43</td><td>27</td><td>38</td><td>40</td></tr> </table>	X	10	18	80	54	49	29	32	20	35	48	64	15	Y	52	41	36	39	41	52	41	51	43	27	38	40	7	L2 CO3
X	10	18	80	54	49	29	32	20	35	48	64	15																		
Y	52	41	36	39	41	52	41	51	43	27	38	40																		
	c.	The following data gives distribution of marks of 100 students. <table border="1" style="margin: 10px auto;"> <tr><td>Marks less than</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td></tr> <tr><td>No. of students</td><td>5</td><td>13</td><td>20</td><td>32</td><td>60</td><td>80</td><td>90</td><td>100</td></tr> </table> Calculate $Q_1$ , Median, $D_4$ and $P_{80}$ .	Marks less than	10	20	30	40	50	60	70	80	No. of students	5	13	20	32	60	80	90	100	10	L2 CO2								
Marks less than	10	20	30	40	50	60	70	80																						
No. of students	5	13	20	32	60	80	90	100																						
5	a.	Four cards are drawn at random from a pack of 52 cards. Find the probability that : i) There are a King, Queen, Jack and Ace. ii) Two King and two Ace iii) All are Diamond.	3	L1 CO1																										
	b.	Explain with the help of flow chart procedure for testing a hypothesis.	7	L3 CO2																										
	c.	Calculate standard deviation and coefficient of variation for the following data. Total number of persons dying is 125. <table border="1" style="margin: 10px auto;"> <tr><td>Age under (yrs)</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td></tr> <tr><td>No. of persons dying</td><td>15</td><td>30</td><td>53</td><td>75</td><td>100</td><td>110</td><td>115</td><td>125</td></tr> </table>	Age under (yrs)	10	20	30	40	50	60	70	80	No. of persons dying	15	30	53	75	100	110	115	125	10	L2 CO3								
Age under (yrs)	10	20	30	40	50	60	70	80																						
No. of persons dying	15	30	53	75	100	110	115	125																						

6	a.	What do you mean by Regression Analysis? Give any two uses of it.	3	L1	CO1																														
	b.	Using least square method calculate trend values for the following data. Also estimate value for the year 2010.	7	L2	CO2																														
		<table border="1"> <tr> <td>Year</td> <td>2002</td> <td>2003</td> <td>2004</td> <td>2005</td> <td>2006</td> <td>2007</td> <td>2008</td> </tr> <tr> <td>Value</td> <td>75</td> <td>67</td> <td>68</td> <td>65</td> <td>54</td> <td>50</td> <td>41</td> </tr> </table>	Year	2002	2003	2004	2005	2006	2007	2008	Value	75	67	68	65	54	50	41																	
Year	2002	2003	2004	2005	2006	2007	2008																												
Value	75	67	68	65	54	50	41																												
	c.	Fit a Poisson distribution to the following data :	10	L2	CO3																														
		<table border="1"> <tr> <td>X</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>F</td> <td>40</td> <td>30</td> <td>20</td> <td>15</td> <td>10</td> <td>5</td> </tr> </table>	X	0	1	2	3	4	5	F	40	30	20	15	10	5																			
X	0	1	2	3	4	5																													
F	40	30	20	15	10	5																													
7	a.	An urn contains 8 white and 3 red balls. If two balls are drawn at random. Find the probability that i) Both are white ii) Both are red iii) One of each colour	3	L2	CO2																														
	b.	Define Time Series Analysis. What are the components of time series?	7	L1	CO1																														
	c.	1000 students at college level are graded according to their IQ and their economic conditions. Use Chi-square test to find out whether there is any association between economic condition and level of IQ.	10	L2	CO3																														
		<table border="1"> <tr> <td></td> <td></td> <td colspan="3">IQ level</td> </tr> <tr> <td></td> <td></td> <td>High</td> <td>Medium</td> <td>Low</td> </tr> <tr> <td rowspan="2">Economic condition</td> <td>Rich</td> <td>160</td> <td>300</td> <td>140</td> </tr> <tr> <td>Poor</td> <td>140</td> <td>100</td> <td>160</td> </tr> </table> <p><math>(\chi_{0.05}^2, d.f2 = 5.991)</math></p>			IQ level					High	Medium	Low	Economic condition	Rich	160	300	140	Poor	140	100	160														
		IQ level																																	
		High	Medium	Low																															
Economic condition	Rich	160	300	140																															
	Poor	140	100	160																															
8	a.	In a certain locality, 1000 light bulbs are installed. Mean life of these bulbs were found to be 120 days. The life of bulbs are normally distributed with S.D of 20 days. Find how many bulbs have life i) less than 90 days ii) less than 140 days iii) more than 100 days iv) more than 130 days v) between 110 and 150 days.	10	L2	CO2																														
	b.	Compute Seasonal Indices using Ratio to Trend method.	10	L2	CO2																														
		<table border="1"> <tr> <td>Year</td> <td>Quarter I</td> <td>Quarter II</td> <td>Quarter III</td> <td>Quarter IV</td> </tr> <tr> <td>1993</td> <td>30</td> <td>40</td> <td>36</td> <td>34</td> </tr> <tr> <td>1994</td> <td>34</td> <td>52</td> <td>50</td> <td>44</td> </tr> <tr> <td>1995</td> <td>40</td> <td>58</td> <td>54</td> <td>48</td> </tr> <tr> <td>1996</td> <td>54</td> <td>76</td> <td>68</td> <td>62</td> </tr> <tr> <td>1997</td> <td>80</td> <td>92</td> <td>86</td> <td>82</td> </tr> </table>	Year	Quarter I	Quarter II	Quarter III	Quarter IV	1993	30	40	36	34	1994	34	52	50	44	1995	40	58	54	48	1996	54	76	68	62	1997	80	92	86	82			
Year	Quarter I	Quarter II	Quarter III	Quarter IV																															
1993	30	40	36	34																															
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