

# CBCS SCHEME

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22MBA14

## First Semester MBA Degree Examination, June/July 2023 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.**

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

			M	L	C																																
<b>1</b>	a.	Discuss the importance of statistics.	3	L1	CO1																																
	b.	Find out missing frequency for the following data, if $\bar{x} = 67.45$ and $n = 100$ <table border="1" style="margin: 5px auto; border-collapse: collapse;"> <tr> <td style="padding: 2px;">CI (Heights)</td> <td style="padding: 2px;">59.5</td> <td style="padding: 2px;">–</td> <td style="padding: 2px;">62.5</td> <td style="padding: 2px;">–</td> <td style="padding: 2px;">65.5</td> <td style="padding: 2px;">–</td> <td style="padding: 2px;">68.5</td> <td style="padding: 2px;">–</td> <td style="padding: 2px;">71.5</td> <td style="padding: 2px;">–</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">62.5</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">65.5</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">68.5</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">71.5</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">74.5</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">Frequency (f)</td> <td style="padding: 2px;">5</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">18</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">?</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">?</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">8</td> <td style="padding: 2px;"></td> </tr> </table>	CI (Heights)	59.5	–	62.5	–	65.5	–	68.5	–	71.5	–		62.5		65.5		68.5		71.5		74.5		Frequency (f)	5		18		?		?		8		7	L3
CI (Heights)	59.5	–	62.5	–	65.5	–	68.5	–	71.5	–																											
	62.5		65.5		68.5		71.5		74.5																												
Frequency (f)	5		18		?		?		8																												
<b>2</b>	a.	If the least value and the highest value in a data are – 8 and 60 respectively. Find range and coefficient of range.	3	L3	CO2																																
	b.	Find the mean deviation from mean for the following distribution : <table border="1" style="margin: 5px auto; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Height</td> <td style="padding: 2px;">60</td> <td style="padding: 2px;">61</td> <td style="padding: 2px;">62</td> <td style="padding: 2px;">63</td> <td style="padding: 2px;">64</td> <td style="padding: 2px;">65</td> <td style="padding: 2px;">66</td> <td style="padding: 2px;">67</td> <td style="padding: 2px;">68</td> </tr> <tr> <td style="padding: 2px;">Frequency</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">14</td> <td style="padding: 2px;">29</td> <td style="padding: 2px;">25</td> <td style="padding: 2px;">12</td> <td style="padding: 2px;">10</td> <td style="padding: 2px;">4</td> <td style="padding: 2px;">2</td> </tr> </table>	Height	60	61	62	63	64	65	66	67	68	Frequency	2	1	14	29	25	12	10	4	2	7	L3	CO2												
Height	60	61	62	63	64	65	66	67	68																												
Frequency	2	1	14	29	25	12	10	4	2																												
<b>3</b>	a.	Define correlation and regression.	3	L1	CO1																																
	b.	An analysis of monthly wages paid to workers, gave the following results : <table border="1" style="margin: 5px auto; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Particulars</td> <td style="padding: 2px;">Firm A</td> <td style="padding: 2px;">Firm B</td> </tr> <tr> <td style="padding: 2px;">Number of wage earners</td> <td style="padding: 2px;">500</td> <td style="padding: 2px;">600</td> </tr> <tr> <td style="padding: 2px;">Average monthly wage (Rs.)</td> <td style="padding: 2px;">5,600</td> <td style="padding: 2px;">6,500</td> </tr> <tr> <td style="padding: 2px;">Standard deviation of wage (Rs.)</td> <td style="padding: 2px;">223.5</td> <td style="padding: 2px;">231.3</td> </tr> </table> <p style="margin-left: 20px;">i) Which firm A or B pays a larger amount of monthly wage? ii) In which firm A or B is there a greater variability in wages?</p>	Particulars	Firm A	Firm B	Number of wage earners	500	600	Average monthly wage (Rs.)	5,600	6,500	Standard deviation of wage (Rs.)	223.5	231.3	7	L3	CO3																				
Particulars	Firm A	Firm B																																			
Number of wage earners	500	600																																			
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Standard deviation of wage (Rs.)	223.5	231.3																																			
<b>3</b>	c.	Calculate lower quartile, upper quartile and 8 <sup>th</sup> decile from the following data : 22, 26, 14, 30, 18, 11, 35, 41, 12, 32.	10	L3	CO3																																



4	a.	Define binomial distribution with example.	3	L1	CO1																					
	b.	Calculate the Karl Pearson's coefficient of correlation for the following data : <table border="1" style="margin-left: 20px;"> <tr> <td>Height</td> <td>23</td> <td>27</td> <td>28</td> <td>28</td> <td>29</td> <td>30</td> <td>31</td> <td>33</td> <td>35</td> <td>36</td> </tr> <tr> <td>Weight</td> <td>18</td> <td>20</td> <td>22</td> <td>27</td> <td>21</td> <td>29</td> <td>27</td> <td>29</td> <td>28</td> <td>29</td> </tr> </table>	Height	23	27	28	28	29	30	31	33	35	36	Weight	18	20	22	27	21	29	27	29	28	29	7	L3
Height	23	27	28	28	29	30	31	33	35	36																
Weight	18	20	22	27	21	29	27	29	28	29																
	c.	Calculate the coefficient of rank correlation. <table border="1" style="margin-left: 20px;"> <tr> <td>x</td> <td>18</td> <td>28</td> <td>35</td> <td>44</td> <td>35</td> <td>26</td> <td>37</td> <td>48</td> </tr> <tr> <td>y</td> <td>83</td> <td>51</td> <td>34</td> <td>34</td> <td>34</td> <td>28</td> <td>46</td> <td>47</td> </tr> </table>	x	18	28	35	44	35	26	37	48	y	83	51	34	34	34	28	46	47	10	L3	CO3			
	x	18	28	35	44	35	26	37	48																	
y	83	51	34	34	34	28	46	47																		
5	a.	Interpret the values of $r = 0$ , $r = -1$ , $r = +1$ .	3	L1	CO1																					
	b.	Explain the scope of statistics.	7	L1	CO1																					
	c.	Calculate Karl Pearson's correlation coefficient from following and interpret. <table border="1" style="margin-left: 20px;"> <tr> <td>x</td> <td>3</td> <td>6</td> <td>7</td> <td>9</td> <td>10</td> <td>13</td> <td>15</td> </tr> <tr> <td>y</td> <td>20</td> <td>18</td> <td>14</td> <td>11</td> <td>9</td> <td>10</td> <td>6</td> </tr> </table>	x	3	6	7	9	10	13	15	y	20	18	14	11	9	10	6	10	L3	CO3					
x	3	6	7	9	10	13	15																			
y	20	18	14	11	9	10	6																			
6	a.	Define Hypothesis.	3	L1	CO1																					
	b.	If 5% electrical bulbs manufactured by a company are defective, use the poisson distribution to find probability in that sample of 100 bulbs : i) None is defective ii) 5 bulbs are defective.	7	L3	CO1																					
	c.	In an intelligence test administered to 500 students and data is normally distributed. The average score was 42 and standard deviation was 24. Find : i) The number of students whose score exceeded 50 ii) The number of students who scored between 30 and 40 iii) The number of students who scored above 60.	10	L5	CO4																					
	7	a.	A sample of 200 bulbs made by a company gives a life time mean of 1540 hours. With a standard deviation of 42 hours. It is likely that the sample has been drawn from a population with a mean life time of 1500 hours. Evaluate at 5% level of significance.	3	L5	CO4																				
	b.	Samples of sales in similar shops of two towns are taken for a new product with following results. <table border="1" style="margin-left: 20px;"> <tr> <th>Town</th> <th>Mean sales</th> <th>Standard deviation</th> <th>Sample size</th> </tr> <tr> <td>A</td> <td>57</td> <td>2.30</td> <td>5</td> </tr> <tr> <td>B</td> <td>61</td> <td>2.19</td> <td>7</td> </tr> </table> i) Is there any evidence of difference in sales of two towns? ii) Use 5% level of significance for testing this difference between means of two samples?	Town	Mean sales	Standard deviation	Sample size	A	57	2.30	5	B	61	2.19	7	7	L5	CO4									
	Town	Mean sales	Standard deviation	Sample size																						
A	57	2.30	5																							
B	61	2.19	7																							
	c.	Below given are figures of production in a steel factory. Fit a trend line using least square method. Also calculate trend value for the year 2022. <table border="1" style="margin-left: 20px;"> <tr> <th>Year</th> <td>2015</td> <td>2016</td> <td>2017</td> <td>2018</td> <td>2019</td> <td>2020</td> <td>2021</td> </tr> <tr> <th>Production</th> <td>80</td> <td>90</td> <td>92</td> <td>83</td> <td>94</td> <td>99</td> <td>92</td> </tr> </table>	Year	2015	2016	2017	2018	2019	2020	2021	Production	80	90	92	83	94	99	92	10	L5	CO4					
	Year	2015	2016	2017	2018	2019	2020	2021																		
Production	80	90	92	83	94	99	92																			
8		Form the following data obtain two regression equations and estimate y when X is 12 and X when y is 12. <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	20	L5	CO4					
x	11	7	9	5	8	6	10																			
y	10	8	6	5	9	7	11																			

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