



First Semester MBA Degree Examination, June/July 2025
Business Statistics

MBA104

Time: 3 hrs.

Max. Marks: 100

- Notes: 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.

	M	L	C																											
Q.1 a. Describe any three properties of a good Average.	3	L2	CO2																											
b. Sizes of land holdings of farmers in a district are given below. From these data calculate mean deviation and co-efficient of mean deviation from median <table border="1"> <tr> <td>Farm size (Acres)</td> <td>5</td> <td>8</td> <td>10</td> <td>12</td> <td>15</td> <td>25</td> <td>50</td> <td>75</td> </tr> <tr> <td>No of farmers</td> <td>24</td> <td>35</td> <td>42</td> <td>58</td> <td>63</td> <td>16</td> <td>9</td> <td>3</td> </tr> </table>	Farm size (Acres)	5	8	10	12	15	25	50	75	No of farmers	24	35	42	58	63	16	9	3	7	L3	CO2									
Farm size (Acres)	5	8	10	12	15	25	50	75																						
No of farmers	24	35	42	58	63	16	9	3																						
c. The following distribution gives the distribution of hourly wage rate of 100 workers in a factory. Find arithmetic mean and Standard deviation <table border="1"> <tr> <td>Hourly wage rate</td> <td>100-150</td> <td>150-200</td> <td>200-250</td> <td>250-300</td> <td>300-350</td> <td>350-400</td> </tr> <tr> <td>No of workers</td> <td>10</td> <td>21</td> <td>34</td> <td>21</td> <td>7</td> <td>7</td> </tr> </table>	Hourly wage rate	100-150	150-200	200-250	250-300	300-350	350-400	No of workers	10	21	34	21	7	7	10	L3	CO2													
Hourly wage rate	100-150	150-200	200-250	250-300	300-350	350-400																								
No of workers	10	21	34	21	7	7																								
Q.2 a. Explain the functions of statistics.	3	L2	CO1																											
b. The following table gives the distribution of marks secured by 60 students in an examination. Calculate a) Harmonic mean and b) Geometric mean <table border="1"> <tr> <td>Marks</td> <td>0-10</td> <td>10-20</td> <td>20-30</td> <td>30-40</td> <td>40-50</td> </tr> <tr> <td>No of students</td> <td>5</td> <td>7</td> <td>15</td> <td>25</td> <td>8</td> </tr> </table>	Marks	0-10	10-20	20-30	30-40	40-50	No of students	5	7	15	25	8	7	L3	CO2															
Marks	0-10	10-20	20-30	30-40	40-50																									
No of students	5	7	15	25	8																									
c. The following data relates to sale of used cars in a city for the period 2017-2023. Predict the sales for the year 2025 using the least square method. <table border="1"> <tr> <td>Year</td> <td>2017</td> <td>2018</td> <td>2019</td> <td>2020</td> <td>2021</td> <td>2022</td> <td>2023</td> </tr> <tr> <td>Sales</td> <td>214</td> <td>320</td> <td>305</td> <td>298</td> <td>360</td> <td>450</td> <td>340</td> </tr> </table>	Year	2017	2018	2019	2020	2021	2022	2023	Sales	214	320	305	298	360	450	340	10	L3	CO4											
Year	2017	2018	2019	2020	2021	2022	2023																							
Sales	214	320	305	298	360	450	340																							
Q.3 a. Distinguish between correlation and regression analysis.	3	L2	CO3																											
b. Calculate spearman rank correlation for the marks awarded by the two judges in a painting competition for 8 participants. <table border="1"> <tr> <td>Participants</td> <td>A</td> <td>B</td> <td>C</td> <td>D</td> <td>E</td> <td>F</td> <td>G</td> <td>H</td> </tr> <tr> <td>Judge 1</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>Judge 2</td> <td>83</td> <td>51</td> <td>34</td> <td>43</td> <td>45</td> <td>28</td> <td>46</td> <td>47</td> </tr> </table>	Participants	A	B	C	D	E	F	G	H	Judge 1	18	28	35	44	35	26	37	48	Judge 2	83	51	34	43	45	28	46	47	7	L3	CO3
Participants	A	B	C	D	E	F	G	H																						
Judge 1	18	28	35	44	35	26	37	48																						
Judge 2	83	51	34	43	45	28	46	47																						
c. Calculate 3 rd quartile, 6 th decile and 20 th percentile from the following data : 22, 26, 14, 30, 18, 11, 35, 41, 12, 32	10	L3	CO2																											

Q.4 a. Define hypothesis.	3	L1	CO4																								
b. Discuss the components of time series.	7	L2	CO2																								
c. Calculate Karl Pearson's co-efficient of correlation for the data given below taking 66 and 63 as assumed means of X and Y respectively <table border="1"> <tr> <td>Height (X)</td> <td>60</td> <td>62</td> <td>64</td> <td>66</td> <td>68</td> <td>70</td> <td>72</td> </tr> <tr> <td>Weight (Y)</td> <td>61</td> <td>63</td> <td>63</td> <td>63</td> <td>64</td> <td>65</td> <td>67</td> </tr> </table>	Height (X)	60	62	64	66	68	70	72	Weight (Y)	61	63	63	63	64	65	67	10	L3	CO3								
Height (X)	60	62	64	66	68	70	72																				
Weight (Y)	61	63	63	63	64	65	67																				
Q.5 a. State any three limitations of Range.	3	L2	CO2																								
b. Find the missing frequency in the following distribution if N= 100 And Median is 32 <table border="1"> <tr> <td>Marks</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>Total</td> </tr> <tr> <td>No. of students</td> <td>10</td> <td>?</td> <td>25</td> <td>30</td> <td>?</td> <td>10</td> <td>100</td> </tr> </table>	Marks	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	Total	No. of students	10	?	25	30	?	10	100	7	L3	CO2								
Marks	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	Total																				
No. of students	10	?	25	30	?	10	100																				
c. The following data relates to annual sales of a company. Calculate (i) three Yearly, (ii) 4 yearly moving averages. <table border="1"> <tr> <td>Year</td> <td>2010</td> <td>2011</td> <td>2012</td> <td>2013</td> <td>2014</td> <td>2015</td> <td>2016</td> <td>2017</td> <td>2018</td> <td>2019</td> <td>2020</td> </tr> <tr> <td>Sales</td> <td>42</td> <td>50</td> <td>52</td> <td>49</td> <td>53</td> <td>55</td> <td>51</td> <td>57</td> <td>60</td> <td>65</td> <td>62</td> </tr> </table>	Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Sales	42	50	52	49	53	55	51	57	60	65	62	10	L3	CO4
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020																
Sales	42	50	52	49	53	55	51	57	60	65	62																
Q.6 a. Define Binomial Distribution. Mention the application of Binomial Distribution.	3	L2	CO3																								
b. The average percentage of defectives in a product manufactured by a company is 30%. Out 10 products manufactured, what is the probability that a) Exactly 2 are defective. b) None are defective.	7	L3	CO3																								
c. A typist commits the following mistakes per page in typing 100 pages. Poisson Distribution Fit a Poisson distribution and calculate the theoretical frequencies. <table border="1"> <tr> <td>Mistakes per page(X)</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>Frequency (f)</td> <td>48</td> <td>27</td> <td>12</td> <td>7</td> <td>4</td> <td>1</td> <td>1</td> </tr> </table>	Mistakes per page(X)	0	1	2	3	4	5	6	Frequency (f)	48	27	12	7	4	1	1	10	L3	CO3								
Mistakes per page(X)	0	1	2	3	4	5	6																				
Frequency (f)	48	27	12	7	4	1	1																				
Q.7 a. Differentiate between one tailed and two tailed test.	3	L3	CO4																								
b. The results of a examination held by a university is summarized as below. <table border="1"> <tr> <td>Gender</td> <td>Mean</td> <td>Standard Deviation</td> <td>No of students</td> </tr> <tr> <td>Boys</td> <td>72</td> <td>8</td> <td>32</td> </tr> <tr> <td>Girls</td> <td>75</td> <td>6</td> <td>36</td> </tr> </table> Test the hypothesis that the mean score of girls are better than boys (use 5% level of significance.	Gender	Mean	Standard Deviation	No of students	Boys	72	8	32	Girls	75	6	36	7	L5	CO4												
Gender	Mean	Standard Deviation	No of students																								
Boys	72	8	32																								
Girls	75	6	36																								

c.	The mother of 180 adolescents (some of them were graduates and others non graduates) were asked whether they agree or disagree on a certain aspect of adolescent behavior. Use Chi-square test at 5 percent significance level to test the association between the attitude and educational qualification.			10	L5	CO4					
		Agree	Disagree				Total				
	Graduate mother	30	50				80				
	Non graduate mother	70	30				100				
Total	100	80	180								
Compulsory Questions											
Q.8	a.	A research company summarized the results of advertising expenditure and sales results as follows:			10	L4	CO2				
		Particulars	Advertising exp.(X) (Rs. In Crore)	Sales(Y) (Rs. In Crore)							
		Average	20	200							
		Std.deviation	18	17							
		Correlation coefficient	0.6								
		Obtain:									
		(i) Two regression equations									
		(ii) Predict the most probable sales when the advertising expenditure is Rs.8 crores									
		(iii) Predict the amount of advertising expenditure when the sales is Rs. 190 crores.									
		CMRIT LIBRARY BANGALORE - 560 037									
b.	The scores of two batsmen Aarush and Vidath in 10 innings during a certain season are given below. Ascertain who is more consistent in scoring runs and a better player.			10	L4	CO2					
	Aarush	32	28				47	63	71	39	10
	Vidath	19	31	48	83	67	90	10	62	40	80
