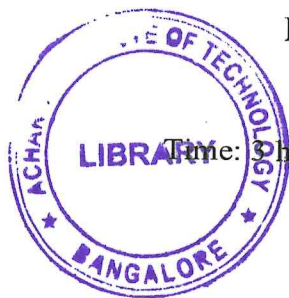


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First Semester MBA Degree Examination, June/July 2026
Business Statistics

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.*

Q.1	a.	Discuss the importance of Business Statistics.								M	L	C																								
										3	L2	CO1																								
	b.	Find 3 rd quartile, 9 th decile and 55 th percentile for the following data								7	L2	CO1																								
		<table><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>60-70</td></tr><tr><td>Frequency</td><td>6</td><td>22</td><td>35</td><td>46</td><td>21</td><td>16</td><td>14</td></tr></table>								Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Frequency	6	22	35	46	21	16	14											
Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70																													
Frequency	6	22	35	46	21	16	14																													
	c.	Calculate Mean, Median, Mode for the following data								10	L2	CO1																								
			<table><tr><td>CI</td><td>200-400</td><td>400-600</td><td>600-800</td><td>800-1000</td><td>1000-1200</td><td>1200-1400</td><td>1400-1600</td><td>1600-1800</td><td>1800-2000</td></tr><tr><td>F</td><td>6</td><td>9</td><td>11</td><td>14</td><td>20</td><td>15</td><td>10</td><td>8</td><td>7</td></tr></table>								CI	200-400	400-600	600-800	800-1000	1000-1200	1200-1400	1400-1600	1600-1800	1800-2000	F	6	9	11	14	20	15	10	8	7						
	CI	200-400	400-600	600-800	800-1000	1000-1200	1200-1400	1400-1600	1600-1800	1800-2000																										
F	6	9	11	14	20	15	10	8	7																											
Q.2	a.	Mention any three properties of Arithmetic mean.								3	L2	CO1																								
										7	L2	CO1																								
	b.	Find Mean deviation from median for the following distribution																																		
		<table><tr><td>Weight</td><td>50</td><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td></tr><tr><td>Frequency</td><td>2</td><td>1</td><td>15</td><td>7</td><td>6</td><td>3</td><td>13</td><td>3</td><td>1</td></tr></table>								Weight	50	51	52	53	54	55	56	57	58	Frequency	2	1	15	7	6	3	13	3	1							
Weight	50	51	52	53	54	55	56	57	58																											
Frequency	2	1	15	7	6	3	13	3	1																											
	c.	The number of runs scored by two batsmen A and B in different innings is as follows. Find i) Which Batsmen is better scorer on an average? ii) Which Batsmen is more Consistent?								10	L2	CO1																								
			<table><tr><td>A</td><td>100</td><td>31</td><td>0</td><td>37</td><td>91</td><td>50</td><td>9</td><td>5</td><td>75</td><td>10</td></tr><tr><td>B</td><td>25</td><td>60</td><td>18</td><td>63</td><td>9</td><td>20</td><td>75</td><td>40</td><td>10</td><td>180</td></tr></table>								A	100	31	0	37	91	50	9	5	75	10	B	25	60	18	63	9	20	75	40	10	180				
	A	100	31	0	37	91	50	9	5	75	10																									
B	25	60	18	63	9	20	75	40	10	180																										
Q.3	a.	Explain the uses of Time series analysis.								3	L5	CO4																								
										7	L3	CO2																								
	b.	A sample of 100 students is chosen from a large group of students. The average height of these students is 162 cm. and standard deviation is 8 cm. At 5% level of significance can we reasonably assume that the average height of large group of students is 160 cm?																																		

c.	The information given below relates to the expenditure on advertisement and sales :		10	L2	CO1																				
<table><tr><td></td><td>Advertisement expenditure (Rs. Lakhs)</td><td>Sales (Rs. Lakhs)</td></tr><tr><td>Mean</td><td>20</td><td>120</td></tr><tr><td>Standard deviation</td><td>5</td><td>2</td></tr></table>				Advertisement expenditure (Rs. Lakhs)	Sales (Rs. Lakhs)	Mean	20	120	Standard deviation	5	2														
	Advertisement expenditure (Rs. Lakhs)	Sales (Rs. Lakhs)																							
Mean	20	120																							
Standard deviation	5	2																							
Correlation coefficient = 0.8																									
i) Find the two regression equations																									
ii) Find likely sales when the expenditure on advertisement is Rs 25 lakhs.																									
Q.4	a.	Define correlation and Regression.	3	L2	CO1																				
	b.	Explain the objectives and components of Time series analysis.	7	L5	CO4																				
	c.	Calculate Spearman's rank correlation coefficient for the following data.	10	L2	CO1																				
<table><tr><td>Marks in English</td><td>25</td><td>32</td><td>25</td><td>30</td><td>28</td><td>30</td><td>34</td><td>36</td><td>24</td></tr><tr><td>Marks in Kannada</td><td>40</td><td>42</td><td>44</td><td>46</td><td>48</td><td>32</td><td>36</td><td>38</td><td>34</td></tr></table>			Marks in English	25	32	25	30	28	30	34	36	24	Marks in Kannada	40	42	44	46	48	32	36	38	34			
Marks in English	25	32	25	30	28	30	34	36	24																
Marks in Kannada	40	42	44	46	48	32	36	38	34																
Q.5	a.	Define Binomial distribution.	3	L4	CO3																				
	b.	The following data represents the blood pressure of 5 persons before and after performing Dhyana : <table><tr><td>Persons</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td></tr><tr><td>B.P before Dhyana</td><td>90</td><td>90</td><td>100</td><td>88</td><td>99</td></tr><tr><td>B.P after Dhyana</td><td>88</td><td>90</td><td>95</td><td>90</td><td>96</td></tr></table> Can we conclude that at 5% level of significance that Dhyana reduces blood pressure?	Persons	A	B	C	D	E	B.P before Dhyana	90	90	100	88	99	B.P after Dhyana	88	90	95	90	96	7	L3	CO2		
Persons	A	B	C	D	E																				
B.P before Dhyana	90	90	100	88	99																				
B.P after Dhyana	88	90	95	90	96																				
	c.	Fit a Poisson distribution to the following data and hence find expected frequencies ($e^{-0.9}=0.4066$) : <table><tr><td>X</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></tr><tr><td>F</td><td>132</td><td>58</td><td>34</td><td>12</td><td>9</td><td>3</td><td>2</td><td>0</td></tr></table>	X	0	1	2	3	4	5	6	7	F	132	58	34	12	9	3	2	0	10	L4	CO3		
X	0	1	2	3	4	5	6	7																	
F	132	58	34	12	9	3	2	0																	
Q.6	a.	Define Type I error and Type II error.	3	L3	CO2																				
	b.	A merchant's file of 20 accounts contains 6 delinquent and 14 non-delinquent accounts. An auditor randomly selects 5 of these accounts for examination. i) What is the probability that the auditor finds exactly 2 delinquent accounts? ii) Find the expected number of delinquent accounts in the sample selected.	7	L4	CO3																				

	c.	The marks obtained by two group of students in a Statistics test are given below <table><tr><td></td><td>Group A</td><td>Group B</td></tr><tr><td>Number of students</td><td>15</td><td>11</td></tr><tr><td>Mean marks</td><td>42</td><td>38</td></tr><tr><td>Standard deviation marks</td><td>10</td><td>15</td></tr></table> On the basis of above data, can it be concluded that at 5% level of significance there is a significant difference in the mean marks obtained by two groups.		Group A	Group B	Number of students	15	11	Mean marks	42	38	Standard deviation marks	10	15	10	L3	CO2
	Group A	Group B															
Number of students	15	11															
Mean marks	42	38															
Standard deviation marks	10	15															

Q.7	a.	Mention the various measures of central tendency.	3	L2	CO1																						
	b.	Compute 4 yearly moving averages from the following data. Comment <table><tr><td>Year</td><td>2000</td><td>2001</td><td>2002</td><td>2003</td><td>2004</td><td>2005</td><td>2006</td><td>2007</td><td>2008</td><td>2009</td></tr><tr><td>sales</td><td>75</td><td>60</td><td>55</td><td>60</td><td>65</td><td>70</td><td>70</td><td>75</td><td>85</td><td>70</td></tr></table>	Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	sales	75	60	55	60	65	70	70	75	85	70	7	L5	CO4
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009																	
sales	75	60	55	60	65	70	70	75	85	70																	
	c.	Below are given the figures of production (in thousand tons)of a sugar factory. <table><tr><td>Year</td><td>2001</td><td>2002</td><td>2003</td><td>2004</td><td>2005</td><td>2006</td><td>2007</td></tr><tr><td>Production</td><td>80</td><td>90</td><td>92</td><td>83</td><td>94</td><td>99</td><td>92</td></tr></table> i) Fit a straight-line trend by the method of least squares and obtain the trend values. ii) Estimate the production of the year 2008.	Year	2001	2002	2003	2004	2005	2006	2007	Production	80	90	92	83	94	99	92	10	L5	CO4						
Year	2001	2002	2003	2004	2005	2006	2007																				
Production	80	90	92	83	94	99	92																				

Q.8		Case Study (Compulsory) The mean and standard deviation of the wages of 6000 workers engaged in a factory are Rs. 1200 and Rs. 400 respectively. Assuming the distribution to be normal estimate :			
	a.	Percentage of workers getting wages above Rs. 1600.	5	L4	CO3
	b.	Number of workers getting wages between Rs. 600 and Rs. 900.	5	L4	CO3
	c.	Number of workers getting wages between Rs. 1100 and Rs. 1500.	5	L4	CO3
	d.	Number of workers getting wages less than Rs. 1700.	5	L4	CO3
