USN

First Semester MBA Degree Examination, Dec.2024/Jan.2025
Business Statistics

Time: 3 hrs.   Max. Marks: 100

Note: 1. Answer any FOUR full questions from Q.No.1 to 7.
2. Q.No. 8 is compulsory.
3. M : Marks , L: Bloom's level , C: Course outcomes.

			M	L	C
Q.1	a.	Define Statistics.	3	L1	CO1
	b.	Mean and standard deviations of two distribution of 100 and 150 items were 50, 5 and 40, 6 respectively, find the mean and standard deviation of all the 150 items taken together.	7	L2	CO1
	c.	Prices of a particular commodity in 5 years in two cities are given below: <table><tr><td>Price in city A :</td><td>20</td><td>22</td><td>19</td><td>23</td><td>10</td></tr><tr><td>Price in city B :</td><td>10</td><td>20</td><td>18</td><td>12</td><td>15</td></tr></table>Find which city has more stable prices.	10	L3	CO2
Q.2	a.	Define types of correlation with an example.	3	L1	CO1
	b.	The measure of skewness for a certain distribution is -0.8. If the lower and upper quartiles are 44.1 and 56.6 respectively, find the median.	7	L2	CO1
	c.	Find out Karl Pearson's co-efficient of correlation from the following data of marks obtained by 10 students in a class test. <table><tr><td>Marks in economics:</td><td>45</td><td>70</td><td>65</td><td>30</td><td>90</td><td>40</td><td>50</td><td>75</td><td>85</td><td>60</td></tr><tr><td>Marks in accountancy :</td><td>35</td><td>90</td><td>70</td><td>40</td><td>95</td><td>40</td><td>60</td><td>80</td><td>80</td><td>50</td></tr></table>	10	L3	CO2
Q.3	a.	Explain the significance of measuring dispersion.	3	L1	CO1
	b.	Discuss difference between parametric and non-parametric test.	7	L1	CO1
	c.	Ten competitors in a chess tournament are ranked by three judges in the following order: <table><tr><td>Judge 1 -</td><td>1</td><td>5</td><td>4</td><td>8</td><td>9</td><td>6</td><td>10</td><td>7</td><td>3</td><td>2</td></tr><tr><td>Judge 2 -</td><td>4</td><td>8</td><td>7</td><td>6</td><td>5</td><td>9</td><td>10</td><td>3</td><td>2</td><td>1</td></tr><tr><td>Judge 3 -</td><td>6</td><td>7</td><td>8</td><td>1</td><td>5</td><td>10</td><td>9</td><td>2</td><td>3</td><td>4</td></tr></table>Use the rank correlation coefficient to discuss which pair of judges have the nearest approach.	10	L3	CO2

			M	L	C
Q.4	a.	Define mode and give 2 suitable examples.	3	L1	CO1
	b.	Define the following terms: i) Independent events ii) Mutually exclusive events iii) Equally likely event.	7	L1	CO1
	c.	Calculate seasonal indices for the rainfall (in mm) in Karnataka given by simple average method. <table><tr><td>Years</td><td>I</td><td>II</td><td>III</td><td>IV</td></tr><tr><td>2017</td><td>118.4</td><td>260</td><td>379.4</td><td>70</td></tr><tr><td>2018</td><td>85.8</td><td>185.4</td><td>407.1</td><td>8.7</td></tr><tr><td>2019</td><td>129.8</td><td>336.5</td><td>403.1</td><td>12</td></tr><tr><td>2020</td><td>283.4</td><td>360.7</td><td>472.1</td><td>14.3</td></tr><tr><td>2021</td><td>849.1</td><td>308.5</td><td>828.8</td><td>15.9</td></tr></table>	10	L4	CO3
Q.5	a.	Define Hypothesis.	3	L1	CO1
	b.	A factory has two machines, machine I produces 30% of the items of output and machine II produces 70% of the items. Further 5% of the items produced by the machine I were defective and only 1% produced by machine II were defective. If the defective item is drawn at random, what is the probability that it was produced by machine I?	7	L2	CO3
	c.	Random samples drawn from normal population are: <table><tr><td>Sample 1:</td><td>20</td><td>16</td><td>26</td><td>27</td><td>23</td><td>22</td><td>18</td><td>24</td><td>25</td><td>19</td><td></td></tr><tr><td>Sample 2:</td><td>27</td><td>33</td><td>42</td><td>35</td><td>32</td><td>34</td><td>38</td><td>28</td><td>41</td><td>43</td><td>30</td><td>37</td></tr></table>Obtain estimate of variance of 2 population and test whether 2 populations are same.	10	L3	CO2
Q.6	a.	Define normal distribution.	3	L1	CO1
	b.	An intelligent quotient of 16 students from one area of a city showed a mean of 107 and SD of 10. While the IQ of 14 students from another area of the city showed mean of 112 and SD of 8. Is there a significance difference between the IQ's of the 2 groups at 0.01 level of significance?	7	L2	CO1
	c.	Explain steps in formulation of hypothesis.	10	L2	CO1
Q.7	a.	Define time series analysis.	3	L1	CO1
	b.	Below are given figures of production (in 000's tons) of a sugar factory. <table><tr><td>Year :</td><td>1999</td><td>2000</td><td>2001</td><td>2002</td><td>2003</td><td>2004</td><td>2005</td></tr><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></table>i) Fit a straight line by the least square and show the trend values. ii) What is the monthly increase in production?	7	L3	CO2

			10	L1	CO2
	c.	On an average a printer makes 4 printing mistakes while printing one page. What is the probability that a randomly observed page is free from mistakes? Among 300 pages, how many pages would you expect mistakes [$e^{-4} = 0.0183$].	10	L1	CO2

Q.8		**CASE STUDY (Compulsory)**			
	a.	Construct 5 year moving average of number of students studying in the college, they are:	10	L1	CO2

Years :	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
No. of students :	332	317	357	392	402	405	410	427	405	431

	b.	Solve the problem using 3years moving average method.	10	L3	CO2

Years :	1999	2000	2001	2002	2003	2004	2005
Duration :	-3	-2	-1	0	1	2	3

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