VPM's
DR VN BRIMS, Thane
Programme: MMS (2021-23)
First Semester Examination April 2022

Course Name:	Business Statistics	**Course Code**	C103
Roll No.		**Marks**	60
Total No. of Questions	6	**Duration**	3 Hours
Total No. of printed pages	3	**Date**	05.04.2022

Course Outcome Statements:

CO1. DEFINE the basic terminologies related to the concepts taught through the syllabus of Business Statistics
CO2. EXPLAIN the concepts related to Data Representation, Central Tendency, Dispersion, Skewness, kurtosis, Probability, Probability Distribution, Sampling Distribution, Estimation, Hypothesis, and the various Statistical Tests.
CO3. MAKE USE OF data to calculate the value of various statistical measures to solve a business problem
CO4. EXAMINE the value of statistical findings to analyse the various business problem
CO5. PRAISE the results of statistical tests for taking a business decision.

Instructions: -

Q. No 1 (All Questions are Compulsory)

Q. No.		Questions	Marks	BL	CO
Q. 1		Case/Case-let Study (500-800 words)			
	a.	"Agastya" a TV show based on Indian historical events has gained popularity among the youth. It is considered to be one of the successful shows of the year 2021. The production house is planning for the next season of the show and they are working on the script. In order to identify the reason of popularity of the current season the team has collected data from two hundred randomly selected youth. They asked them if the TV show "Agastya" as a whole is primarily considered entertaining, educational or a waste of time (Only one answer could be selected). The respondents were categorized by gender. These responses are given in the following table:	**6**	**Level 4**	**CO4**

Gender	Opinion			
	Entertaining	Educational	Waste of time	Total
Female	52	28	30	110
Male	28	12	50	90
Total	80	40	80	200

Analyse the data collected from 200 respondents and check if there is relationship between gender and opinion of the population at 0.05 significance level. (Table value: 9.488)

	b.	Vishal Sales has a store in Thane, Ghodbunder Road. The store was opened in the year 2018 and wishes to increase its market share. They know that employee plays a vital role in the organization's success. So, to motivate the employees, they want to design an incentive policy for the employee based on the efficiency of the workers in the past three months. They also want to determine if there is any difference in the sales of the employee w.r.t past three months. The following table gives the number of refrigerators sold by 4 employees in three months January, February, and March	**6**	**Level 5**	**CO5**

Months	Employee			
	A	B	C	D
January	50	40	48	39
February	46	48	50	45
March	39	44	40	39

On the basis of this information, **decide** if employee and months impacts the sales i.e.
(i) there is a significant difference in the sales made by the four employees? (Table value: 19.164)

		(ii) there is a significant difference in the sales made during the three months? (Table value: 7.7086)			
Q. 2		Answer **Any one** from the following.			
	a.	Twelve students were given intensive coaching and 5 tests were conducted in a month. The scores of tests 1st and 5th are given below. **Evaluate** if any improvement in the scores has been obtained from the first to fifth tests at a 0.05 significance level? (Table value: 1.796) No. of Students / Marks in 1st test / Marks in 5th test 1 / 50 / 62 2 / 42 / 40 3 / 51 / 61 4 / 26 / 35 5 / 35 / 30 6 / 42 / 52 7 / 60 / 68 8 / 41 / 51 9 / 70 / 84 10 / 55 / 63 11 / 62 / 72 12 / 38 / 50	**6**	**Level 5**	**CO5**
	b.	A study of consistency in academic performance is conducted. The following data shows marks in graduation and post-graduation. Determine using correlation if the students are consistent in their academic performance. Applicant / Marks in graduation / Marks in post-graduation A / 15 / 40 B / 20 / 30 C / 28 / 50 D / 12 / 30 E / 40 / 20 F / 60 / 10 G / 20 / 30 H / 80 / 60	**6**	**Level 5**	**CO5**
Q. 3		Answer **Any one** from the following.			
	a.	**Analyse** the data given below and find out which series is more variable Series A / Series B 192 / 83 288 / 87 236 / 93 229 / 109 184 / 124 260 / 126 384 / 101 291 / 102 330 / 108 243	**6**	**Level 4**	**CO4**
	b	**Examine** the data to find out if the data is normally distributed **Values in Rs.** / **Frequency** Less than 50 / 40 50-100 / 80 100-150 / 130 150-200 / 60 200 and above / 30	**6**	**Level 4**	**CO4**

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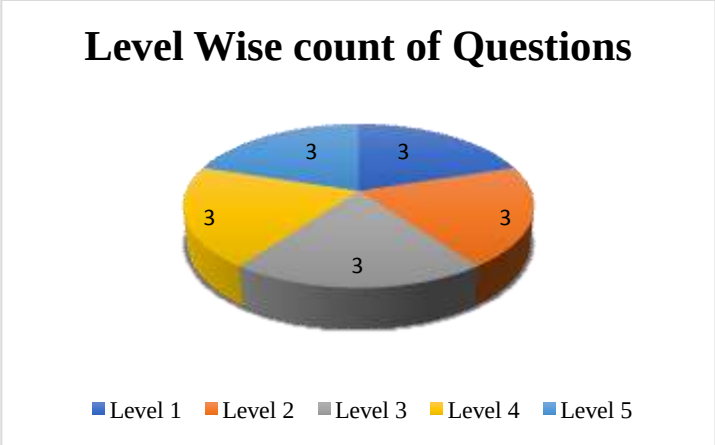
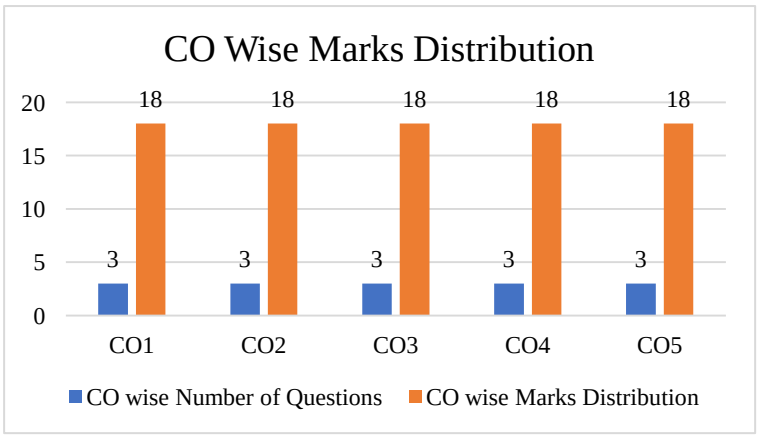
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Q. 4</td><td></td><td>Answer Any two from the following.</td><td></td><td></td><td></td></tr>
<tr><td></td><td>a.</td><td>A company manufactures different types of electric appliances. It has been using the radio for advertising its products. The following table shows the amount of radio time (X, in minutes) and the number of electrical appliances sold (Y) over the last seven years. Construct the regression equation of Y on X.
<table>
<tr><td>X</td><td>25</td><td>18</td><td>32</td><td>21</td><td>35</td><td>28</td><td>30</td></tr>
<tr><td>Y</td><td>16</td><td>11</td><td>20</td><td>15</td><td>26</td><td>32</td><td>20</td></tr>
</table></td><td>6</td><td>Level 3</td><td>CO3</td></tr>
<tr><td></td><td>b</td><td>A company has two plants to manufacture scooters. Plant I manufacture 70% of the scooters and plant II manufactures 30%. At the plant I 80% of the scooters are rated standard quality and at plant II 90% of the scooters are rated standard quality. A scooter is picked up at random and is found to be of standard quality. Identify the probability that it has been produced by plant I?</td><td>6</td><td>Level 3</td><td>CO3</td></tr>
<tr><td></td><td>c.</td><td>The following data gives the distribution of companies according to the size of capital.
<table>
<tr><th>Capital (Lacs Rs.)</th><th>No. of Companies</th></tr>
<tr><td>0-5</td><td>20</td></tr>
<tr><td>5-10</td><td>7</td></tr>
<tr><td>10-15</td><td>2</td></tr>
<tr><td>15-20</td><td>9</td></tr>
<tr><td>20-25</td><td>10</td></tr>
<tr><td>25-30</td><td>5</td></tr>
<tr><td>total</td><td>53</td></tr>
</table>
Make use of data to calculate mean and median.</td><td>6</td><td>Level 3</td><td>CO3</td></tr>
<tr><td>Q. 5</td><td></td><td>Answer Any two from the following.</td><td></td><td></td><td></td></tr>
<tr><td></td><td>a.</td><td>Explain with the help of an example how the data is collected and tabulated in form of class interval and frequency distribution.</td><td>6</td><td>Level 2</td><td>CO2</td></tr>
<tr><td></td><td>b</td><td>Compare between
i. Null and Alternate hypothesis
ii. Simple random sampling and Snowball sampling</td><td>6</td><td>Level 2</td><td>CO2</td></tr>
<tr><td></td><td>c.</td><td>Illustrate with the help of an example how are following concepts are used in business decision making
i. EMV
i. Binomial distribution</td><td>6</td><td>Level 2</td><td>CO2</td></tr>
<tr><td>Q. 6</td><td></td><td>Answer Any two from the following.</td><td></td><td></td><td></td></tr>
<tr><td></td><td>a.</td><td>What are the different types of charts used in statistics? Write a short note on the utility of these charts?</td><td>6</td><td>Level 1</td><td>CO1</td></tr>
<tr><td></td><td>b</td><td>What do you understand by Kurtosis? How is it different from skewness?</td><td>6</td><td>Level 1</td><td>CO1</td></tr>
<tr><td></td><td>c.</td><td>Define Mutually exclusive and non-Mutually exclusive events with the help of an example?</td><td>6</td><td>Level 1</td><td>CO1</td></tr>
</table>



Bloom's Taxonomy Levels		
Level Name	**Level Number**	**Level Wise count of Questions**
Remember	**Level 1**	**3**
Understand	**Level 2**	**3**
Apply	**Level 3**	**3**
Analyze	**Level 4**	**3**
Evaluate	**Level 5**	**3**



Course Outcomes	CO wise Number of Questions	CO wise Marks Distribution
CO1	**3**	**18**
CO2	**3**	**18**
CO3	**3**	**18**
CO4	**3**	**18**
CO5	**3**	**18**