

**GUJARAT TECHNOLOGICAL UNIVERSITY****MBA INTEGRATED - SEMESTER- II EXAMINATION – WINTER 2019****Subject Code: 2527102****Date: 15/11/2019****Subject Name: Business Statistics****Time: 02:30PM to 05:30PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

**Q.1 (a)** What is statistics? Write a note on various functions and applicability of statistics in business. **07**

**(b)** What do you understand by 'Central tendency'? Describe the measures of central tendency. Also, define the related positional measures, like quartiles, deciles and percentiles. **07**

**Q.2 (a)** Compute the Mean, median, Mode, Variance and Standard deviation on the following data. **07**

Class	Frequency
20-30	8
30-40	7
40-50	1
50-60	0
60-70	3
70-80	1

**(b)** Construct a histogram, a frequency polygon, and Ogive for the following frequency distribution. **07**

Class interval	Frequency
50-60	13
60-70	27
70-80	43
80-90	31
90-100	9

**OR**

**(b)** Explain the measures of dispersion? What does a measure of variation serve? In the light of these, comment on some of the well-known measures of variation. **07**

**Q.3 (a)** Machines A, B, and C all produce the same two parts, X and Y. Of all the parts produced, machine A produces 60%, machine B produces 30%, and machine C produces 10%. In addition, **07**

40% of the parts made by machine A are part X.

50% of the parts made by machine B are part X.

70% of the parts made by machine C are part X.

A part produced by this company is randomly sampled and is determined to be an X part. With the knowledge that it is an X part, revise the probabilities that the part came from machine A, B, or C.

**(b)** Explain the properties of Correlation and Regression in detail. Differentiate **r** and **r<sup>2</sup>** **07**

**OR**

**Q.3 (a)** What is Probability? What are the different approaches of probability explain in detail. Explain the structure of probability in brief. **07**

**(b)** Determine the value of the coefficient of correlation for the following data. **07**

X	4	6	7	11	14	17	21
Y	18	12	13	8	7	7	4

**Q.4 (a)** A sample of 12 small accounting firms reveals the following numbers of professionals per office. **07**

6, 8, 10, 13, 11, 9, 7, 15, 12, 5, 13, 4

1. Determine the mean
2. Determine the mode
3. Determine the median
4. Determine the range
5. Determine the standard deviation
6. What is the CV for this data
7. Determine  $P_{15}$

**(b)** Differentiate between Permutation and Combination with appropriate examples. **07**

**OR**

**Q.4 (a)** A bag contains 10 items of which 3 are defective. If three items are drawn one after another without replacement, find the probability that all are defective. **07**

**(b)** Compute a spearman's rank correlation for the following variables to determine the degree of association between the two variables. **07**

X	23	41	37	29	25	17	33	41	40	28	19
Y	201	259	234	240	231	209	229	246	248	227	200

**Q.5 (a)** Arithmetic mean and standard deviation of monthly profits of two companies X and Y for a year are given below : **07**

	X	Y
Mean	100	90
Standard Deviation	25	18

Comment on the consistency of these companies with respect to their profits by applying coefficient of variation technique.

**(b)** What is Probability? Explain the structure of probability in brief. **07**

**OR**

**Q.5 (a)** A production department uses a sampling procedure to test the quality of newly produced items. The department employs the following decision rule at an inspection plan: If a sample of 14 items has a variance of more than 0.005, the production line must be shut down for repair. The following data have just been collected: 3.43, 3.45, 3.43, 3.48, 3.52, 3.50, 3.39, 3.48, 3.41, 3.38, 3.49, 3.45, 3.51, and 3.50. Should the production line be shut down? Why or why not? **07**

**(b)** Find the regression equation of Y on X where Y and X are the marks obtained by 10 students as given below: **07**

Y	20	60	55	45	75	35	25	90	10	50
X	20	45	65	40	55	35	15	80	25	50

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