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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2142505 **Date:17/05/2019**

Subject Name: Probability and Introduction to Statistics

Time:02:30 PM TO 05:00 PM **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)** Explain in brief: What is operation research? **03**

(b) Define: (i) Range (ii) Quartile deviation (iii) Average deviation (iv)Variance. **04**

(c) Explain different types of graphs (charts) which are used to present statistical data. **07**

Q.2 **(a)** What is data? List various types of data and explain any one of them. **03**

(b) Compare various measures of central tendencies. **04**

(c) Calculate the mode using analytical and graphical method for the following distribution. **07**

Gross profit as percentage of sales	0-7	7-14	14-21	21-28	28-35	35-42	42-49
Number of companies	19	25	36	72	51	43	28

OR

(c) In a survey of 50 chemical industries the following data was collected: Calculate the variance for the distribution. **07**

Level of profit	10	15	20	25	30
Number of companies	15	10	15	6	4

Q.3 **(a)** Explain Skewness and Kurtosis. **03**

(b) Explain the basic rules for probability. **04**

(c) Describe conditional probability with suitable example. **07**

OR

Q.3 **(a)** Discuss the properties of Hyper Geometric Distribution. **03**

(b) Explain Chi-Square " test for goodness of fit". **04**

(c) Explain Analysis of Variance (ANOVA). **07**

Q.4 **(a)** Define : (i) Null Hypothesis (ii) Systematic Sampling (iii) Mode **03**

(b) What is Simple Linear Regression? **04**

(c) An item is manufacture by three machines, M1, M2, M3. Out of the total manufacturing during specified production period, 50% are manufactured on M1, 30% on M2, and 20% on M3.it is also known that 2% of item are produced by M1 and M2 are defective, While 3% of those manufacture on M3 are defective. All items are put into on bin. From the bin , One item is drawn random and found to be defective. What is the probability that it was made on M1, M2, M3??? **07**

OR

Q.4 **(a)** Define : (i) Event (ii) Ogives (iii) Geometric mean **03**

(b) What are Null Hypothesis and Alternate Hypothesis? **04**

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(c) Discuss t-test with suitable example. **07**

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Q.5 **(a)** Explain correlation coefficient. **03**

(b) Suppose a random variable X has the following probability function: **04**

X	4	6	8	10
P(X)	0.2	0.3	0.4	0.5

Find expectation and variance of X.

(c) Explain Normal distribution with suitable example. **07**

OR

Q.5 **(a)** Find the Harmonic mean of **4, 8, 16, 32, 64**. **03**

(b) A random variable X has a Poisson distribution with a mean of 3. Find **P (1 ≤ X ≤ 3)**?

(c) Explain briefly scatter diagram with suitable example.

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