

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**



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 $P(1 \leq X \leq 3)$?

(c) Explain briefly scatter diagram with suitable example.

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