

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER- IV (New) EXAMINATION – WINTER 2019

Subject Code: 2142505
Date: 13/12/2019
Subject Name: Probability and Introduction to Statistics
Time: 10:30 AM TO 01:00 PM
Total Marks: 70
Instructions:

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

MARKS

Q.1 (a) Define/ explain following: **03**

1. Random Experiment
2. Primary data
3. Ogives

(b) Calculate the mean for the following data **04**

Class	0-7	7-14	14-21	21-28	28-35	35-42	42-49
Frequency	19	25	36	72	51	43	28

(c) Find variance, standard deviation and coefficient of variation for the following data set. **07**

Gross profit (in % of Sales)	0-10	10-20	20-30	30-40	40-50
No. of Companies	22	38	46	35	20

Q.2 (a) Define/ explain following: **03**

1. Random Variable
2. Cumulative Distribution Function
3. Compound Events

(b) Compare various measures of Central Tendencies. **04**

(c) Discuss Joint Probability Distribution with suitable example. **07**

OR

(c) Discuss Normal Distribution with suitable example. **07**

Q.3 (a) State Baye's Theorem **03**

(b) Discuss Type-I and Type –II error. **04**

(c) When a machine is set correctly, it produces 25% defectives; otherwise it produces 60% defectives. From the past knowledge and experience, the manufacturer knows that the chances that the machine is set correctly or wrongly are 50:50. The machine was set and before commencement of production, one piece was inspected and found to be defectives. What is the probability of machine set up being correct? **07**

OR

Q.3 (a) Briefly explain Binomial Distribution **03**

(b) Explain probability sampling method **04**

(c) What is Probability? Discuss Classical approach and Bayesian Approach for assigning probability. **07**

Q.4 (a) Give properties of Expectation **03**

(b) A machine produces 50 articles per day. On average 3 articles produced are found defective in a day. If a sample of 15 articles are drawn at random, what is the probability that one article of this lot is defective? **04**

(c) Explain z-test with suitable example. **07**

OR

- Q.4** (a) What is Simple Linear Regression? **03**
- (b) Let X and Y be the random variables such that $E[X] = 2.8$, $E[Y] = 5.3$, $V[X] = 18.6$, $V[Y] = 41.3$. Compute the following: **04**
1. $E(X+1)$
 2. $E(X+2Y+1)$
 3. $V(2X+5)$
 4. $V(6Y+9)$
- (c) For the probability distribution: **07**
- | | | | | | |
|--------|------|------|------|------|------|
| X | 0 | 1 | 2 | 3 | 4 |
| $P(X)$ | 0.25 | 0.35 | 0.25 | 0.10 | 0.05 |
- Find $E[X]$ and $V[X]$
- Q.5** (a) Give properties of Binomial Distribution **03**
- (b) Explain application of Chi-Square Test **04**
- (c) Discuss F-test with suitable example. **07**
- OR**
- Q.5** (a) Explain Correlation Coefficient. **03**
- (b) Discuss Simple Random Sampling. **04**
- (c) Discuss ANOVA with suitable example. **07**

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