

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2023****Subject Code:2142505****Date:17-07-2023****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.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- Q.1** (a) Define: Arithmetic Mean, Geometric Mean, Harmonic Mean. **03**
 (b) Define: (i) Range (ii) Quartile deviation (iii) Average deviation (iv) Variance. **04**
 (c) The following frequency distribution gives the value obtained in 60 rolls of a dice. **07**
 Find the mean, median and mode.

Value (x)	1	2	3	4	5	6
Frequency (f)	9	8	12	11	13	7

- Q.2** (a) State and explain Baye's Theorem. **03**
 (b) Explain T-test with suitable example. **04**
 (c) A card is drawn from a pack of 52 cards. Find the probability of getting a jack or a heart or a red card. **07**

OR

- (c) Discuss the properties of Binomial and Poisson's distribution **07**
- Q.3** (a) Compare various measures of Central Tendencies. **03**
 (b) Explain with example: Random Experiment, Exhaustive Events. **04**
 (c) A bag contains 6 white and 4 black balls and a second bag has 4 white and 8 black balls. One of the bags is chosen at random and two balls are drawn from it. Find the probability that one is white and other is black. **07**

OR

- Q.3** (a) Define i) Balking ii) Reneging iii) Jockeying. **03**
 (b) Explain Type-I and Type-II error with reference to hypothesis testing. **04**
 (c) Explain the Concept of conditional probability with suitable example. **07**

- Q.4** (a) Define the correlation coefficient. **03**
 (b) What are null hypothesis and alternate hypothesis? **04**
 (c) The table below gives the marks of 8 students in the test in two subjects A and B. Calculate the coefficient of correlation between x and y. **07**

Students	1	2	3	4	5	6	7	8
Marks in Sub A: x	10	6	9	10	12	13	11	9
Marks in Sub B: y	9	4	6	9	11	13	8	4

OR

- Q.4** (a) Explain skewness and kurtosis. **03**
 (b) Write a short note on ANOVA analysis. **04**
 (c) What is Probability? Discuss Classical approach and Bayesian Approach for assigning probability. **07**

- Q.5 (a)** Write the two regression lines X on Y and Y on X. **03**
(b) Explain Chi-Square " test for goodness of fit" **04**
(c) The following are the details. **07**

X	1	5	3	2	1	1	7	3
Y	6	1	0	0	1	2	1	5

Fit the regression line of y on x and predict y when x=5.

OR

- Q.5 (a)** Write the test statistic for two way ANOVA classification. **03**
(b) Explain z-test with suitable example. **04**
(c) The following data gives the weight and chest size of 10 infants at birth. **07**
 Compare the variability of the two characteristics in the infants.

Weight (kg)	2.75	3.12	4.15	5.5	3.20	4.32	2.31	5.12	4.12	3.72
Chest (cm.)	29.1	30.1	32.1	36.1	30.2	33.1	28.2	35.1	31.9	31.1
