

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA INTEGRATED– SEMESTER III- EXAMINATION –WINTER-2023

Subject Code:2638602**Date: 07/12/2023****Subject Name: Basic 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. Use of simple calculators and non-programmable scientific calculators are permitted.

Q.1(a) Define the following terms: **07**

- | | |
|-----------------------------|----------------------|
| 1) Sample | 2) Population |
| 3) IQR | 4) Skewness |
| 5) Pie chart | 6) Independent Event |
| 7) Mutually Exclusive event | |

(b) Construct a histogram and frequency polygon for the following data: **07**

Income (in Rs.)	0 - 50	50 - 100	100 -150	150 - 200	200 - 250	250 -300
Frequency	10	30	80	90	40	20

Q.2(a) Discuss the measures of central tendency with suitable example. **07****(b)** A dataset contains the following five values: **07**

5, 9, 16, 17 and 18

Determine the Mean, Variance, SD and MAD.

OR**(b)** Two dies are thrown simultaneously, and the sum of the numbers obtained is found to be 7. What is the probability that the number 3 has appeared at least once? **07****Q.3(a)** Write down the formula and properties of Poisson distribution. **07****(b)** A clothing company produces men's jeans. The jeans are made and sold with **07**

either a regular cut or a boot cut. In an effort to estimate the proportion of their men's jeans market in Oklahoma City that prefers boot-cut jeans, the analyst takes a random sample of 212 jeans sales from the company's two Oklahoma City retail outlets. Only 34 of the sales were for boot-cut jeans. Construct a 90% confidence interval to estimate the proportion of the population in Oklahoma City who prefer boot-cut jeans.

OR

Q.3(a) A production company's 350 hourly employees average 37.6 years of age, with a standard deviation of 8.3 years. If a random sample of 45 hourly employees is taken, what is the probability that the sample will have an average age of less than 40 years? **07**

(b) A fair coin is tossed 10 times, what are the probability of getting exactly 6 heads and at least six heads. **07**

Q.4(a) Discuss Sampling methods in detail. **07**

(b) If 10% of a population of parts is defective, what is the probability of randomly selecting 80 parts and finding that 12 or more parts are defective? **07**

OR

Q.4(a) A GMAT test that have a mean of 494 and a standard deviation of 100, assume GMAT scores are normally distributed. What is the probability of obtaining a score greater than 700? What is the probability of randomly drawing a score that is 550 or less? **07**

(b) Calculate a t-test for the following data of the number of times people prefer coffee or tea in five time intervals. (Only calculated value of t-test) **07**

Coffee	4	5	7	6	9
Tea	3	8	6	4	7

Q.5(a) Discuss the types of hypothesis. **07**

(b) A teacher claims that the mean score of students in his class is greater than 82 with a standard deviation of 20. If a sample of 81 students was selected with a mean score of 90 then check if there is enough evidence to support this claim at a 0.05 significance level. **07**

OR

Q.5(a) Draw a scatter plot and determine the equation of the regression line from the following data: **07**

No. Of Beds	FTEs	No. Of Beds	FTEs
23	69	50	138
29	95	54	178
29	102	64	156
35	118	66	184
42	126	67	176
46	125	78	225

(b) A company wants to improve the quality of products by reducing defects and monitoring the efficiency of assembly lines. In assembly line A, there were 18 defects reported out of 200 samples while in line B, 25 defects out of 600 samples were noted. Is there a difference in the procedures at a 0.05 alpha level? **07**
