Enrolment No. /Seat No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA INTEGRATED – SEMESTER III- EXAMINATION –WINTER-2024

Subject Code:2638602   **Date: 06/12/2024**
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) Class Midpoint   2) Experiment
         3) Ogive   4) Frequency Polygon
         5) Event   6) Correlation
         7) Scatter Plot

    (b) Construct a stem-and-leaf plot for the data given in the following table: **07**

Cloth Lengths (Centimeters)									
5	1	20	12	27	2	30	5	7	38
40	47	1	2	1	32	4	44	33	23

Q.2 **(a)** Define Data. Explain levels of Data Measurement in detail with suitable example.   **07**
    (b) A bag I contains 4 white and 6 black balls while another Bag II contains 4 white and 3 **07**
black balls. One ball is drawn at random from one of the bags, and it is found to be black.
Find the probability that it was drawn from Bag I.

<p align="center">OR</p>

    (b) Discuss the measures of variability in detail with suitable example.   **07**

Q.3 **(a)** A fair coin is tossed 10 times, what are the probability of getting exactly 5 heads and at **07**
least five heads.
    (b) For some computers, the time period between charges of the battery is normally **07**
distributed with a mean of 50 hours and a standard deviation of 15 hours. Rohan has one
of these computers and needs to know the probability that the time period will be between
50 and 70 hours.

<p align="center">OR</p>

Q.3 **(a)** Explain Marginal, Joint, Union and conditional probabilities with suitable example.   **07**
    (b) Let sample mean be the mean of a random sample of size 50 drawn from a population **07**
with mean 112 and standard deviation 40. Find the probability that sample mean assumes
a value between 110 and 114 and also find the probability that sample mean assumes a
value greater than 113.

Q.4 **(a)** If 10% of a population of parts is defective, what is the probability of randomly selecting **07**
80 parts and finding that 12 or more parts are defective?
    (b) Suppose scores on exams in statistics are normally distributed with an unknown **07**
population mean and a population standard deviation of 3 points. A random sample of
36 scores is taken and gives a sample mean score of 68. Find a 90% confidence interval
to estimate the population mean exam scores.

<p align="center">OR</p>

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

(b) A company claims that their product weighs 500 grams on average. A sample of 64 **07** products has a mean weight of 498 grams. The population standard deviation is known to be 8 grams. At a 1% significance level, is there evidence to reject the company's claim?

Q.5 (a) Calculate a t-test (only calculated value) for the following data of the number of times **07** people prefer coffee or tea in five time intervals.

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

(b) Sketch a scatter plot from the following data, and determine the equation of the **07** regression line.

X	6	10	2	4	6	7	0	1	8	5	3
Y	82	88	56	64	77	92	23	41	80	59	47

OR

Q.5 (a) Write a note on: **07**
  1) Null Hypothesis & Alternative Hypothesis
  2) Type – I & Type – II Error

(b) Compute SSE, S_e and r^2 for the following data: **07**

X	61	63	67	69	70	74	76	81
Y	4.280	4.080	4.420	4.170	4.480	4.300	4.820	4.700
X	86	91	95	97				
Y	5.110	5.130	5.640	5.560				

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