Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA INTEGRATED– SEMESTER -III EXAMINATION –SUMMER-2021

Subject Code: 2638602 Date: 18/09/2021

Subject Name: Basic Statistics

Time: 02:30 PM TO 5:00 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)** What is Data? Explain different types of Data Measurement. **07**

(b) For the following data calculate Correlation Coefficient. **07**

X	12	14	13	16	18	20	22	23
Y	25	26	24	27	28	29	32	33

Q.2 **(a)** In a study of job satisfaction, a series of tests was administered to 50 subjects. The following data were obtained: higher scores represent greater dissatisfaction. Construct a stem-and-leaf display for the data. **07**

87	67	92	41	90	76	58	59	50	75
80	70	69	88	85	81	73	61	46	97
50	81	75	65	77	47	87	60	92	71
70	53	61	84	70	74	43	89	83	46
84	78	69	78	74	76	64	76	67	64

(b) Using given marks of 10 students in a sample, compute mean, median, mode, Standard deviation and coefficient of variation. **07**
Marks: 23,22,24,26,27,28,29,30,32,33

OR

(b) The probability that a bomb dropped from an aero plane will hit the target is 0.4. Five bombs are dropped from the aero plane to destroy a bridge. 2 bombs are sufficient to destroy the bridge. What is the probability that the bridge will be destroyed? **07**

Q.3 **(a)** State the Baye's rule. A producer purchases parts of machine from two suppliers B1 and B2 And he stores the purchased parts in big urn. The producer knows that his past experience That 9 % of the parts purchased from B1 and 5 % of the parts purchased from B2 are defective. The supplier supply parts to the producer in proportion 4 : 1. A part is chosen at random From the urn and found to be non-defective what is the probability that the part has been Supplied by B1 ? **07**

(b) Phone calls arrive at the rate of 48 per hour at the reservation desk for Regional airways. **07**

(1) Compute the probability of receiving three calls in a five minute interval of time.

(2) Compute the probability of receiving exactly ten calls in fifteen minutes.

(3) If no calls are being processed, what is the probability that the agent can take three minutes for personal time without being interrupted by a call?

OR

Q.3 **(a)** A population has a mean of 50 and a standard deviation of 10. If a random sample of 64 is taken, what is the probability that the sample mean is each of the following? **07**

a. Greater than 52
b. Less than 51
c. Less than 47
d. Between 48.5 and 52.4
e. Between 50.6 and 51.3.

(b) List all types of sampling methods. Explain any two Probabilistic and any two non-probabilistic sampling methods. **07**

Q.4 **(a)** A sample of items selected from normal population is 10, 5, 7, 8, 20, 25, 15, 2 and 12. Compute point estimate and 95% interval estimate of population mean. **07**

(b) A manufacturer supplies the rear axles for trucks. These axles must be able to withstand 80000 pounds per square inch in stress tests, but an excessively strong axle raises production costs significantly. Experience indicates that the standard deviation of the strength of its axles is 4000 pounds per square inch. The manufacturer selects a sample of 100 axles from production, tests them, and finds that the mean stress capacity of the sample is 79600 pounds per square inch. Test the hypothesis at 5% level that the sample has come from the same population. **07**

OR

Q.4 **(a)** A sample of 400 male students is found to have a mean height of 151.38 cm. Can it reasonably regarded as a sample from a large population with mean height 171.17 cm. and standard deviation 3.30cm? **07**

(b) Explain Type-I and Type -II errors in brief. **07**

Q.5 **(a)** It is claimed that 20% of Indian consumers used internet to buy gifts during Diwali festival. In a sample of 900 customers this year, it is found that 15% used internet to buy gifts during Diwali. Test the claim at $\alpha = 0.05$. **07**

(b) The manufacturer of a certain make of electric bulbs claims that his bulbs have a mean life of 25 months with a standard deviation of 5 months. A random sample of 6 bulbs gave the following values. **07**
Life of months : 24,26,30,20,20,18
Can you regard the producer's claim to be valid at 1% level of significance?

OR

Q.5 **(a)** For the Following Data **07**

X	2	3	5	1	8
Y	25	25	20	30	16

Calculate
(1)Develop a Scatter diagram for this data.
(2)Compute the estimated regression equation.

(b) A Population has a mean of 200 and a standard deviation of 50. Suppose a simple random sample of size 100 is selected and sample mean is used to estimate. **07**
I. What is the probability that the sample mean will be within 5 of the population mean?
II. What is the probability that the sample mean will be within 10 of the population mean?

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