Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2014

Subject code: 711403N **Date: 19-06-2014**

Subject Name: Statistical and Numerical Analysis

Time: 02:30 pm - 05:00 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)** Find Quartile ($P_{0.25}$, $P_{0.50}$, & $P_{0.75}$) and Percentile ($P_{0.37}$ & $P_{0.95}$) from the following data. **07**

5.5	5.9	13.2	12.1	14.2	16.8	28.1	18.3	31.8	24.4
6.6	5.6	11.2	13.2	20.7	21.1	19.2	29.1	30.2	31.8
5.6	7.5	8.5	9.3	25.3	16.4	25.7	29.8	15.5	15.4
33.0	10.9	8.4	10.0	6.3	21.9	30.0	7.1	25.2	14.3

(b) Two People are selected at random from a group of 7 men & 5 men women, find the probability that both are men or both are women. **07**

Q.2 **(a)** There are 52 Playing Card in one box, Find out the probability under given Conditions. **07**

1) Selected card is black
2) Selected card is a Photo Card
3) Selected Card is a red or Queen

(b) A Problem of Statistics is given to Three Students Rahul, Rushabh and Raj whose Chances of Solving the problem are 1/2, 1/3 and 1/4 respectively. What is Probability that Given Problem Will be solved by them? **07**

OR

(b) A consulting firm rent car from 3 Agencies 20% from D, 20% from E and 60% from F. If 10% of Car from D, 12% Car from E and 4% car from F have bad tires, find out the probability to get bad tires from agency F (Use Bayeôs Theorem) **07**

Q.3 **(a)** Solve the System of equations using Guess Elimination Method. **07**

$$X_1 + 2X_2 + (-1)X_3 = 2$$

$$3X_1 + 6X_2 + X_3 = 1$$

$$3X_1 + 3X_2 + 2X_3 = 3$$

(b) Solve the system of equations using Gauss Seidel Method. **07**

$$27X + 6Y ï Z = 85$$

$$6X + 15Y + 2Z = 72$$

$$X + Y + 54Z = 110$$

OR

Q.3 **(a)** Find the Inverse matrix for given Matrix. **07**

$$\begin{bmatrix} 12 & 4 & -1 \\ 4 & 7 & 1 \\ -1 & 1 & 6 \end{bmatrix}$$

(b) Solve the System of equation using LUD composition **07**

$$X_1 + 2X_2 + 3X_3 = 5$$
$$2X_1 - 4X_2 + 6X_3 = 18$$
$$3X_1 - 9X_2 - 3X_3 = 6$$

Q.4 **(a)** A Simply Supported beam carried a concentrated load P at the mid-point, Corresponding to various value of P max Deflection Y is measured as follows. Fit a lone for equation Y = a + bP and also find value of Y when P=150. **07**

(b) Evaluate following F (X) by dividing in to 10 Equal Parts using **07**

1) By Trapezoidal Rule
2) By Simpsonôs 1/3 Rule

$$\int_0^{\pi} Sin\, X\, dx$$

OR

Q.4 **(a)** Fit the Parabola for Equation $Y = aX^2 + bX + C$ using Given Data **07**

X	0	1	2	3	4
Y	1	1.8	1.3	2.5	2.3

(b) Evaluate following Using Gaussian 1 point, 2 point and 3 point Formula. **07**

$$\int_0^1 \frac{dt}{1+t}$$

Q.5 **(a)** During one stage of Manufacturing Chips for Laptop colour must be applied if 70% of Chips received dark colour find the probability out of 15 such chips **07**

1) At least 12 have dark colour
2) At most 6 have dark colour
3) 10 chips have dark colour

(b) For final dissertation topics related for Statistics following Data is found n=80, $\overline{x} = 18.85$, $s^2 = 30.77$. Construct 99% Confidence Interval. **07**

OR

Q.5 **(a)** Find the probability that random variable having Standard Normal Distribution will take on value **07**

1) Between 0.87 & 1.28
2) Between -0.34 & 0.62
3) > 0.85
4) > -0.65

(b) A tracking firm is Suspicious of the claim that the average life time of certain tires is at least 28,000 km to check this claim 40 of the tires are selected. Mean of data is 27,463 km with standard deviation of 1348 km. what can be concluded if the Probability type I error is at most 0.01. **07**

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