Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA Integrated – SEMESTER – 3 • EXAMINATION – SUMMER 2018

Subject Code: 4430603   **Date: 23-May-2018**

Subject Name: Statistical Methods

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) Do as directed :   **07**
- **(i)** Define : Degree of freedom
- **(ii)** If A and B are mutually exclusive events then what is the value of $P(A \cap B)$?
- **(iii)** List out applications of statistics in business and economics.
- **(iv)** Arithmetic operators are appropriate for_____data. (Quantitative/ Qualitative)
- **(v)** Define : Type-I error and Type-II error
- **(vi)** What is ogive ?
- **(vii)** Write full form of : ANOVA

(b) Construct Stem & Leaf Display for following data.   **07**

86,77,91,60,55,76,92,47,88,67,23,59,72,75,83,77,68,82,97,89,81,75,74,39,67,79,83, 70,78,91,68,49,56,94,81

Q.2 (a) Meclia Matrix Collected data showing most popular website browsing at home and work.   **07**

Websites	Unique Visitors (X)
About.com	5538
Alvita.com	7391
Amazon.com	7986
Ag.com	8917
Aol.com	23863
Ebay.com	6786
Excite.com	8296
Mountan.com	10479

- **(i)** Compute Mean and Median
- **(ii)** Compute First Quartile and Third Quartile
- **(iii)** Compute 85th Percentile

(b) A bowler's score for six games were x : 182, 168, 184, 190, 170, and 174. Using these data as a sample. Compute the following data.   **07**
- **(i)** Variance
- **(ii)** Standard Deviation
- **(iii)** Coefficient of Variance

OR

(b) Consider the following data : **07**

$$X \quad : \quad 5 \quad 9 \quad 16 \quad 17 \quad 18$$

Find :
- **(i)** Mean absolute deviation (MAD)
- **(ii)** Sample variance
- **(iii)** Sample standard deviation

Q.3 (a) Given $P(A) = 0.10$, $P(B) = 0.12$, $P(C) = 0.21$, $P(A \cap C) = 0.05$ & $P(B \cap C) = 0.03$ **07** then solve the following :
- **(i)** $P(A \cup C)$
- **(ii)** $P(B \cup C)$
- **(iii)** If A and B are mutually exclusive events then find $P(A \cup B)$

(b) Find following from binomial formula: **07**
- **(i)** If n=4 , p =0.10 then find P(x=3)
- **(ii)** If n=20 , p =0.06 then find P(x < 3)
- **(iii)** If n=20 , p=0.06 then find P(x= greater than or equal 3)

OR

Q.3 (a) Bank customers arrive randomly on weekday afternoon at average rate(lamda) of **07** 3.2 customers in every 4 minute.(Use poison distribution)
- **(i)** What is the probability of having exactly 8 customers in 4 minute?
- **(ii)** What is the probability of having greater than 9 but less than 12 customers in 4 minutes ?
- **(iii)** What is the probability of having exactly 10 customers in 8 minutes?

(b) The Average (mean) stock price for companies making up is 494 and Standard **07** deviation is 100 then Assume the stock prices are normally distributed.
- **(i)** What is the probability a company will have a stock price exactly 700 ?
- **(ii)** What is the probability a company will have a stock price greater than 700 ?
- **(iii)** What is the probability a company will have a stock price between 300 and 600 ?

Q.4 (a) A company rate before and after viewing inspection report of different 7 years is **07** given in following table. Consider 0.05 level significance & Check following hypothesis :

Null hypothesis : $D = 0$
Alternative hypothesis : $D < 0$

Before	After
32	39
11	15
21	35
17	13
30	41
38	39
14	22

(b) A random sample of 112 item is taken, resulting in a sample mean 78695 and **07** population standard deviation is 14530. Assume population mean (μ) is 74914 and consider 5 % significance level . Check following hypothesis :

Null hypothesis : $\mu = 74914$
Alternative hypothesis : $\mu \neq 74914$

OR

Q.4 (a) Use the following Sample information & Construct 95% confidence interval for **07** difference in mean of two population.

	Sample-1	Sample-2
Sample size :	50	50
Sample mean :	21.45	24.60
Population standard deviation :		
	3.46	2.99

(b) A random sample of 20 item is taken, resulting in a sample mean 25.51 and sample **07** standard deviation is 2.1933 .Assume population mean (μ) is 25 and consider alpha 0.05 significance level .Use t-test to check following hypothesis :

Null hypothesis : $\mu = 25$

Alternative hypothesis : $\mu \neq 25$

Q.5 (a) Given are Five observation for two variable X and Y. **07**

X	1	2	3	4	5
Y	3	7	5	11	14

(i) Calculate Regression Equation by using b0 and b1

(ii) Use estimated Regression to predict value of Y when X = 4

(b) Compute One-Way ANOVA table for following data & find value of F. **07**

X1	X2	X3
29	32	25
27	33	24
30	31	24
27	34	25
28	30	26

OR

Q.5 (a) Consider following data. **07**

X	2	4	5	7	8
Y	2	3	2	6	4

Assume regression equation of these data is : $\hat{Y} = 2.65 + (0.25) X$

(i) Compute the SSE, SST & SSR

(ii) Compute the Coefficient of Determination (r^2)

(b) Construct the five number summary for following data & Draw Box Plot. **07**

87	80	73	69	82	72
85	79	73	68	76	65
84	79	73	68	82	75
84	77	72	65	64	71
81	71	74	63	81	74
73	69	62	81	62	70

****