Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA INTEGRATED - SEMESTER– III EXAMINATION – WINTER 2016

Subject Code: 4430603 **Date:23/11/ 2016**

Subject Name: STATISTICAL METHODS

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.**

Q.1 **(a)** What is the Difference between the Qualitative and Quantitative data ? **07**

(b) Following data shows marks of 10 students in two subjects SM and OS. Find correlation coefficient between them. **07**

SM	15	20	18	30	25	12	22	24	20	10
OS	12	18	20	25	20	15	25	20	15	15

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) For the following Frequency distribution calculate mean, Variance, Standard Deviation and coefficient of Variation. **07**

Year	2002	2003	2004	2005	2006	2007	2008	2009
Dividend Payment	22	24	30	50	68	81	90	98

OR

(b) Compute the 35th percentile, the 55th percentile, Q_1,Q_2 & Q_3 for the following data: **07**

16,28,29,13,17,20,11,34,32,27,25,30,19,18,33

Q.3 **(a)** Assuming that half of the Indian population is vegetarian. Estimate how many investigators out of 100 will report that 3 or less are vegetarian in the sample of 10 individuals. **07**

(b) 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**

OR

Q.3 **(a)** For events A and B , P (A' ∩ B) = 0.1, P (A∩B') = 0.4 and P (A' U B') = 0.6 Find the (1) P (A) (2) P (B) (3) P (A U B) (4) P (A' U B) **07**

(b) Define the normal distribution. **07**

Marks of large number of students are distribution normally with mean 50 and standard

Deviation 12. If a student is selected at random what is the probability that his marks will be Between (1) 38 and 62 (2) 26 and 74 (Given area between z = 0 and z = 1 is 0.34135 & z = 0 and z = 2 is 0.47725)

Q.4 **(a)** Explain the terms: Standard error, Margin of error, point estimate, confidence interval **07**

(b) 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**

OR

Q.4 **(a)** A survey of 611 office workers investigated telephone answering practices including how often each office worker was able to answer incoming telephone calls and how often incoming telephone calls went directly to voice mail. A total 281 office workers indicated that they never need voicemail and are able to take every telephone call. **07**

(1)What is the point estimate of the proportion of the population of office workers who are able to take every telephone call?

(2) At 90% confidence, what is margin of error?

(3) What is the 90% confidence interval for the proportion of the population of office workers who are able to take every telephone call

(b) Explain the Other Sampling Methods. **07**

Q.5 **(a)** A man buys 50 electric bulbs of 'Philips' and 50 electric bulbs of 'HMT' Brand. He fined that 'Philips' bulbs give an average life of 1500 hrs. With standard deviation of 60 hrs. and 'HMT' bulbs gave an average life of 1512 hours with standard deviation of 80 hrs. is there a significant difference in the mean life of two brands of bulbs ? (At 5 % level significance = 1.96) **07**

(b) Develop one way ANOVA on the following data. **07**

No. 1	No. 2	No. 3	No. 4
113	120	132	122
121	127	130	118
117	125	129	125
110	129	135	125

Determine the observed F value. Compare it to the critical F value and decide whether to reject the null hypothesis. Use a 1% level of significance.

OR

Q.5 **(a)** The following data shows sales made by salespeople from two different cities. **07**

City A: 59,68,44,71,63,46,69,54,48

City B : 50,36,62,52,70,41

Assuming the populations sampled to be approximately normal having the same variance, test whether there is any significant difference between the means of these samples.

(b) Explain Type I and Type II error with example. **07**

****