

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA - SEMESTER– III EXAMINATION – SUMMER - 2016

Subject Code: 630003

Date: 30-05-2016

Subject Name: STATISTICAL METHODS

Time: 02.30 p.m. To 05.00p.m.

Total Marks: 70

Instructions:

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Statistical tables for various distributions are permitted to be used.**

- Q.1 (a)** A Batsman's score in six games were 182, 168, 184, 190, 170, and 174. Calculate the following: (i) Range (ii) Variance (iii) Standard deviation (iv) coefficient of variation. **07**
- (b)** (i) Differentiate between discrete random variable and continuous random variable with example. **04**
(ii) Write properties of binomial distribution. **03**
- Q.2 (a)** (i) Explain different methods of sampling with example. **04**
(ii) Explain the properties of point estimators. **03**
- (b)** The average stock price for companies making up the S& P index is \$30, and the standard deviation is \$8.20. Assume the stock prices are normally distributed. **07**
(i) What is the probability a company will have a stock price of at least \$40?
(ii) What is the probability a company will have a stock price no higher than \$20?
(iii) How high does a stock price have to be to put a company in top 10%?
- OR**
- (b)** Explain the properties of normal distribution. **07**
- Q.3 (a)** Explain the types of error in testing of hypothesis. **07**
- (b)** Explain different uses of χ^2 test. **07**
- OR**
- Q.3 (a)** The following results were obtained when two sets of items were subjected to two different treatments X and Y, to enhance their tensile strength. **07**
Treatment X was applied on 400 items and 80 were found to have gained in strength.
Treatment Y was applied on 400 items and 20 were found to have gained in strength.
Is treatment Y superior to treatment X?
- (b)** The heights of six randomly chosen soldiers are in inches: 76, 70, 68, 69, 69 and 68. Those of six randomly chosen sailors are 68, 64, 65, 69, 72 and 64. Discuss in the light of the data throw on the suggestion that soldiers are, on the average taller than sailors. [Hint: t test] **07**
- Q.4 (a)** The following data were collected on the height (inches) and weight (pounds) of women swimmers. **07**

Height	68	64	62	65	66
Weight	132	108	102	115	128

- (i) Develop the estimated regression equation by computing the values of b_0 and b_1 .

(ii) If a swimmer's height is 63 inches, what would you estimate her weight to be?

(b) Explain the applications of statistics in business and economics. **07**

OR

Q.4 (a) The following data are the monthly salaries y and the grade point averages x for students who obtained a bachelor's degree in business administration with a major in information systems. The estimated regression equation for these data is $= 1790.5 + 581.1x$. **07**

GPA	2.6	3.4	3.6	3.2	3.5	2.9
Salary	3300	3600	4000	3500	3900	3600

(i) Compute SST, SSR and SSE.

(ii) Compute the coefficient of determination. Comment on the goodness of fit.

(iii) What is the value of the sample correlation coefficient?

(b) Explain different scales of measurement with example. **07**

Q.5 (a) The survey asked the following question: "How many of the last four issues have you read? Suppose that the following frequency distribution summarizes 500 responses. **07**

Number Read	0	1	2	3	4
Frequency	15	10	40	85	350

(i) What is the mean number of issues read by a Fortune subscriber?

(ii) What is the standard deviation of the number of issues read?

(b) The following table shows the probabilities of blood types in the general population. **07**

	A	B	AB	O
Rh +	.34	.09	.04	.38
Rh -	.06	.02	.01	.06

(i) What is the probability a person will have type O blood?

(ii) What is the probability a person will be Rh-?

(iii) What is the probability a person will be Rh – given he or she has type O blood?

(iv) What is the probability a person will have type B blood given he or she is Rh+?

(v) What is the probability a married couple will both be Rh-?

(vi) What is the probability a married couple will both have type AB blood?

OR

Q.5 (a) A Harris interactive survey for Intercontinental hotels and resorts asked respondents, "When traveling internationally, do you generally venture out on your own to experience culture or stick with your tour group and itineraries?" The survey found that 23% of the respondents stick with their tour group. **07**

(i) In a sample of six international travelers, what is the probability that two will stick with their tour group?

(ii) In a sample of six international travelers, what is the probability that at least two will stick with their tour group?

(iii) In a sample of 10 international travelers, what is the probability that none will stick with their tour group?

(b) An average of 15 aircraft accidents occur each year. **07**

- (i) Compute the mean number of aircraft accidents per month.
- (ii) Compute the probability of no accidents during a month.
- (iii) Compute the probability of exactly one accident during a month.
- (iv) Compute the probability of more than one accidents during a month.
