Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(New) EXAMINATION – SUMMER 2016

Subject Code:2142505 Date:03/06/2016

Subject Name:Probability and Introduction to Statistics

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.**

MARKS

Q.1 **Short Questions (Each answer contain equal marks.)** **14**

1 Define data presentation device?

2 Define central tendency

3 What is operation research?

4 List out various type of operation research models

5 Define - quartiles

6 Define - Probability

7 What is ANOVA?

8 Define mutually exclusive and exhaustive event

9 In which condition Poisson distribution used?

10 What is the function of operating characteristics curve?

11 What is regression analysis?

12 What is sample space and random variable?

13 Stat the Baye's theorem

14 Define Geometric mean.

Q.2 **(a)** Write the steps for constructing a frequency distribution. **03**

(b) Explain moments of statistical properties. **04**

(c) Calculate the second, third, and fourth moments for the following distribution of service time at registration counter of a local post office. **07**

Service time(in minutes)	2.0	2.5	3.0	3.5	4.0	4.5
Number of frequency	5	30	40	15	5	5

OR

(c) Function in the daily sales of two products, X and Y, are given below. Find out which of the two shows greater function in sales. **07**

Daily sales for product X: 620, 624, 622, 625, 622, 618, 619, 616, 623, 625, 626, 625.

Daily sales for product Y: 2152, 2134, 2132, 2145, 2132, 2142, 2146, 2130, 2146, 2142, 2150, 2135, 2152.

Q.3 **(a)** Which assumption are made for arithmetic mean? **03**

(b) Explain skewness and kurtosis. **04**

(c) Given below is the data of 32 Indian companies for the dividend declared during a particular year. This data has been collected for textile company from published sources. **07**

Textile company : 13, 14, 16, 18, 16, 16, 22, 19, 15, 12, 16, 16, 16, 16, 15, 14, 16, 13, 18, 18, 15, 14, 16, 12, 0, 8, 11, 8, 12, 14, 10, 18.

From above data

(i) find average dividend declared.

(ii) find the coefficient of variation.

(iii) find the third moments.

OR

Q.3 **(a)** Explain median with suitable example. **03**

(b) Explain the basic rules for probability. **04**

(c) Given below is the data of 32 Indian companies for the dividend declared during a particular year. This data has been collected for chemical company from published sources. **07**

Chemical company : 24, 26, 24, 23, 24, 22, 23, 30, 22, 19, 26, 20, 26, 27, 18, 23, 14, 20, 24, 22, 0, 22, 20, 27, 21, 13, 26, 16, 15, 21, 24, 20.

From above data

(i) find average dividend declared.

(ii) find the coefficient of variation.

(iii) find the third moments.

Q.4 **(a)** In competitive examination 30 candidates are to be selected. in all 600 candidates appear in a written test and 100 will be called for interview. what is the probability that a person will be called for the interview? Determine the probability of a person getting selected, if he has been called for interview. **03**

(b) Explain Type - I and Type - II error in hypothesis testing. **04**

(c) Consider project that yield an average cash flow of Rs. 500 lakhs with a standard deviation of Rs. 60 lakhs. calculate the following probabilities: **07**

(i) cash flow will be more than Rs. 560 lakhs

(ii) cash flow will be less than Rs. 420 lakhs

(iii) cash flow will lie between Rs. 460 lakhs and Rs. 540 lakhs.

(iv) cash flow will be more than Rs. 680 lakhs.

OR

Q.4 **(a)** Calculate the mode for the following distribution: **03**

Gross profits as % sales	0-7	7-14	14-21	21-28	28-35	35-42	42-49
No. of companies	19	25	36	72	51	43	28

(b) Explain Chi-Square " test for goodness of fit" **04**

(c) Following is the frequency distribution of the number of arrivals per unit of time(say, interval of ten minutes) of patients at the outpatient department of a local hospital. Using the X^2 test of goodness of fit, verify whether the arrivals follow a Poisson probability distribution. **07**

No of arrivals (x_i) :	0	1	2	3	4	5	6	7
Observed frequency(f_{io}) :	10	30	40	50	35	20	10	5

Q.5 **(a)** Find out the number of permutations of four letters A, B, C and D taken two at a time. **03**

(b) Which steps are involved in hypothesis testing? **04**

(c) A manufacturer wants to test the hypothesis that the mean life time of two brands of machines used are equal. the life time is measured by number of operating hours between the overhauls. The manufacturer keeps overhaul statics on all his machines. A random sample of 15 machines gives the following details. **07**

Operating hours between overhauls:
Brand X - 1050, 1150, 850, 800, 1000, 1350, 1100, 1300, 1450, 900, 1200, 1250, 1550, 825, 650.
Brand Y - 1170, 970, 880, 1410, 700, 775, 940, 1650, 950, 1190, 600, 1600, 975, 450, 1290.

Using Mann-Whitney test, will you conclude that the lifetime of two brands are equal?

OR

Q.5 **(a)** Calculate the harmonic mean of the following distribution. **03**

Dividend Yield :	2 - 4	4 - 6	6 - 8	8 - 10
Number of companies:	20	40	30	10

(b) Explain briefly scatter diagram. **04**

(c) Given below are the monthly income and their net savings of a sample of 10 supervisory staff belonging to a firm. calculate the correlation coefficient. **07**

Employee No.	1	2	3	4	5	6	7	8	9	10
Monthly income(Rs.)	780	360	980	250	750	820	900	620	650	390
Net savings.	84	51	91	60	68	62	86	58	53	47

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