Seat No.:	Enrolment No.

Subject Code:2142505

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-IV (New) EXAMINATION - WINTER 2015

Subject Name: Probability and Introduction Statistics Time: 2:30pm to 5:00pm **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) Explain different types of graphs (charts) which are used to present statistical 07 data. (b) Explain with example: Random Experiment, Outcome, Trial and Event, 07 Exhaustive Events. 0.2Explain different type's correlation and their types. 07 (a) Calculate the coefficient of skewness for the following distribution: **07** 0-10 10-20 20-30 Debt as Percentage of 30-40 40-50 50-60 **Total Capitalization** Number of companies 15 17 19 27 19 12 OR (b) Discuss the properties of Binomial and Poisson's distribution 07 0.3 Explain Analysis of Variance (ANOVA). 07 (a)

(b) From the following data, obtain (1) The regression line y on x and (2) The regression line x on y.

 x
 1
 2
 3
 4
 5

 y
 9
 11
 5
 8
 7

OR

Q.3 (a) The competitors in a beauty contest are ranked by three judges in the following order. Use rank correlation coefficient to discuss which pair of judges has nearest approach to beauty.

1 st Judge	1	5	4	8	9	6	10	7	3	2
2 nd Judge	4	8	7	6	5	9	10	3	2	1
3 rd Judge	6	7	8	1	5	10	9	2	3	4

(b) The number of bacterial cells(X) per unit volume in a culture at different hours (Y) is given below.

X	0	1	2	3	4	5	6	7	8	9
Y	43	46	82	98	123	167	199	213	245	272

Fit a line of regression of Y on X and estimate the number of bacterial cells after 12 hours.

Q.4 (a) Describe conditional probability with suitable example.

07

07

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(b) Find the median for the following distribution: Gross profit as

07

Percentage of sales	0-10	10-20	20-30	30-40	40-50
Number of companies	22	38	46	35	20

Q.4 (a) Calculate the lower and upper quartiles, fourth decile and the 60th percentile 07 for the following distribution.

Percentage	of	5-10	10-	15-	20-	25-	30-	35-	40-
dividend			15	20	25	30	35	40	45
declared									
Number	of	5	6	15	10	5	4	2	2
companies									

(b) Explain Arithmetic Mean, Geometric Mean, Harmonic Mean.

Q.5 (a) A machine is producing bolts of which a certain fraction is defective. A random sample of 400 is taken from a large batch and is found to contain 30 defective bolts. Does this indicate that the proportion of defectiveness is larger than that claimed by the manufacturer where the manufacturer claims that only 5% of his products are defective? Find 95% confidence limits of the proportion of defective bolts in batch. ($Z_a = 1.645$ at 5% level of significan ce)

(b) The lifetime of electric bulbs for a random sample of 10 from a large **07** consignment gave the following data:

Item	1	2	3	4	5	6	7	8	9	10
Life in '000 hrs	4.2	4.6	3.9	4.1	5.2	3.8	3.9	4.3	4.4	5.6

Can we accept the hypothesis that the average lifetime of bulb is 4000 hrs?

OR

- Q.5 (a) Four cards are drawn at random from a pack of 52 cards. Find the probability 07 that (1) They are a king, a queen, a jack and an ace.
 - (2) Two are kings and two are queens.
 - (3) Two are black and two are red.
 - (b) Compare raw moment and central moment and derive relationship between 07 them.

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