Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – VI EXAMINATION – WINTER 2015

Subject Code:162501 **Date:15/12/ 2015**

Subject Name: Statistical Methods & Quality Control

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 methods of Data collection and representation in detail **07**

(b) Calculate arithmetic mean, median and mode for the following ungrouped data **07**
25,26,32,18,24,38,42,16,26,25,24,32,29,34,26,37,32,31,38,40,43,36,32,36,34,
38,42,35,27,21,22,41,38,37,26,37,29,40,38,27,36,26,24,37,23,26,35,32,27,26

Q.2 **(a)** In a dairy, the milk is filled in bags of 500gms by machines P, Q and R which respectively produce 30%, 25% and 45% of total output. It is also found that 3,5 and 2 percent of the bag produced by machine P,Q and R have either overfilling or underfilling of milk. An inspector from government made random check and found that the bag was not correctly filled and booked a case against dairy. The dairy management wanted to know which machine the bag must have been filled. What are the probabilities that it was filled by machine P,Q and R **07**

(b) Explain significance of standard deviation, skewness and kurtosis with suitable example and figure. **07**

OR

(b) For the following JOINT probability distribution of X and Y find: **07**

1. P[X=Y], P[X≥Y]
2. E[X], E[Y], Var [X] and Var [Y]

Y \ X	2	3	5
1	0.1	0.05	0.2
3	0.2	0.15	0.3

Q.3 **(a)** Consider a project that yields an average cash flow of Rs 500 lakhs with standard deviation of Rs. 60 lakhs. Calculate the following probabilities **07**

1. Cash flow will be more than Rs. 550 lakhs.
2. Cash flow will be less than Rs. 410 lakhs
3. Cash flow will lie between 450 lakhs to 510 lakhs

(b) Explain the properties of Binomial distribution and its applications with suitable example **07**

OR

Q.3 **(a)** Customer arrive at "Central Mall" in a poisson manner at the rate of 5/minute. Find the probability that in any given hour **07**

1. at least 3 arrive
2. no customer arrive
3. more than 2 customers arrive
4. exactly 4 customer arrive

(b) Describe t-test and F-test with suitable example **07**

Q.4 A manufacturer of machine parts is considering buying one of 5 machines currently in the market. The following is the daily output on five randomly selected days for each machine **14**

Machine 1	Machine 2	Machine 3	Machine 4	Machine 5
72	62	68	64	72
56	70	72	72	62
68	66	74	68	68
65	64	70	68	64
60	78	66	58	70

Do five machine have equal output rate ? set up ANOVA and make the decision

OR

Q.4 **(a)** Explain chi-square test for goodness of fit with suitable example **07**

(b) Explain regression and correlation coefficient with suitable example **07**

Q.5 **(a)** What do you mean by testing of Hypothesis ? explain any three cases with an example **07**

(b) Explain different types of attribute charts for quality control with suitable example **07**

OR

Q.5 **(a)** Draw OC Curve and explain the following terminology **07**
1. AQL 2. LTPD 3. Consumer Risk 4. Producer's Risk

(b) Explain single, double and multiple sampling with a case problem **07**

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