

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII • EXAMINATION – WINTER 2013

Subject Code: 171504**Date: 03-12-2013****Subject Name: Industrial Statistics and Quality Management****Time: 10:30 TO 01:00****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) Define statistics. Explain the role of industrial statistics in the field of quality management. **07**
- (b) Define “Quality”. Explain quality characteristics giving suitable examples. Also briefly discuss the steps for establishing proper control of the quality characteristics. **07**

- Q.2** (a) “A true total quality environment can have only one focus : Customer Satisfaction.” – Explain. **07**
- (b) What do you understand by central tendency ? Give an example for each of following cases where the most appropriate average is (i) Mean (ii) Median (iii) Mode (iv) Geometric mean **07**

OR

- (b) Distinguish between (i) Histogram and Ogive (ii) Dispersion and Skewness **07**
- Q.3** (a) What do you understand by skewness and kurtosis ? Point out their role in analyzing a frequency distribution. **07**
- (b) A factory produces two types of T.V. – LCD and LED T.V. In an experiment related to their life, the following results were obtained. **07**

Length of life	No. of LCD T.V.	No. of LED T.V.
1000-1200	6	5
1200-1400	12	31
1400-1600	27	13
1600-1800	11	9
1800-2000	9	7

OR

- Q.3** (a) What is meant by dispersion ? Which are the commonly used measures of dispersion ? What are the merits of standard deviation ? **07**
- (b) In an audit of a company’s billing an auditor randomly selects five bills. If 10% of bills contain an error what is the probability that auditor will find **07**
- (i) Exactly 2 bills with error
 - (ii) At least 2 bills not containing error.

- Q.4** (a) Explain the concept of regression. Mention its utility. Also explain linear regression. **07**
- (b) Draw suitable control chart for following data pertaining to the number of foreign coloured threads (considered as defects) in 15 pieces of cloth of 2x2m of a certain make of fibre and state your considerations. **07**
- 8, 13, 4, 21, 20, 6, 5, 4, 9, 7, 1, 9, 5, 6, 18.

OR

- Q.4** (a) M/s ABC Ltd. is a job-order manufacturing concern which manufactures one time large products. Which type of inspection method needs to be adopted to get a qualitative product. Discuss briefly. **07**

- (b) The following table gives the distribution of the total population and those who are totally and partially blind among them. **07**

Find out if there is any relation between age and blindness :

Age :	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of Persons (In thousands)	100	60	40	36	24	11	6
Blind	55	40	40	40	36	22	18

- Q.5** (a) What does the control charts tell us about the process ? How can the quality be improved by the use of these charts ? **07**

- (b) Briefly explain the concept of TQM and also discuss its impact on productivity. **07**

OR

- Q.5** (a) What is process capability ? List the basic elements of a process capability analysis. **07**

- (b) Mention the following on a typical O.C. curve for single sampling plan (rough sketch) **07**

AQL = 4.0%, $\alpha = 0.02$, $\beta = 0.10$, LQ = 14.2%

Explain the meaning of each term.
