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GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2018

Subject Code: 2171504   **Date: 29/11/2018**
Subject Name: Industrial Statistics & Quality Management
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	**(a)**	Define "Quality" from different perspective.	**03**
	(b)	Define statistics. Differentiate between statistics as data and statistics as method.	**04**
	(c)	What do you mean by quality control ? State difference between inspection and quality control. Also explain "cost of quality".	**07**
Q.2	**(a)**	Define probability and explain its importance in SQC.	**03**
	(b)	Explain the following terms : (i) Quality assurance (ii) Quality management	**04**
	(c)	"A true total quality environment can have only one focus : Customer satisfaction". – Explain.	**07**

OR

	(c)	Critically examine the statement : "Statistics can prove anything".	**07**
Q.3	**(a)**	Distinguish between Histogram and Ogive.	**03**
	(b)	State various kinds of distribution and explain the important characteristics of any one of them.	**04**
	(c)	A day's production schedule calls for 8000 items. Three machines each with a daily production capacity of 3000 are available and the probability that an item is defective is 1, 2, & 4 percent for machines A, B, & C respectively. On a given day 3000 items were produced on machine A, 3000 on machine B and 2000 on machine C. One item is selected at random and found defective. What is the probability that this item was produced on machine A ?	**07**

OR

Q.3	**(a)**	What do you understand by skewness and kurtosis ?	**03**
	(b)	Explain in short about Baye's theorem.	**04**

	(c)	In a partially destroyed laboratory record of an analysis of correlation data, the following results are only legible :
		Variance of X = 9
		Regression equations : 4X – 5Y + 33 = 0
		                                     20X – 9Y - 107 = 0
		
		Find : (i) the mean value of X and Y
		        (ii) the standard deviation of Y, and
		        (iii) the correlation coefficient
			07

Q.4	**(a)**	State the benefits from quality assurance on reliability.	**03**
	(b)	What is the meaning of (i) Process natural tolerance and (ii) Assignable causes ?	**04**

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(c) The following are the sample means and ranges for 10 samples each of size 5. Calculate the control limits for mean chart and range chart and state whether the process is in control or not. **07**

Sample No.	Mean	Range	Sample No.	Mean	Range
1	4.94	0.3	6	5.10	0.1
2	4.92	0.4	7	4.98	0.8
3	4.92	0.2	8	5.02	0.5
4	4.92	0.4	9	4.96	0.3
5	4.98	0.1	10	5.04	0.5

(Take A2 = 0.577, D3 = 0, D4 = 2.115 for sample size of 5)

OR

Q.4 **(a)** What do you understand by TQM? **03**
  (b) Explain the main reasons for variations. **04**
  (c) During an examination of equal length of cloth, the following are the no. of defects observed : **07**

3, 2, 1, 0, 4, 5, 3, 7, 2, 4, 1

Draw suitable control chart and comment whether the process is under control or not ?

Q.5 **(a)** What is process capability ? **03**
  (b) What information does the O.C. curve provide ? **04**
  (c) Explain the sampling plan which requires less amount of inspection for given values of consumer's risk and producer's risk. **07**

OR

Q.5 **(a)** List the basic elements of a process capability analysis. **03**
  (b) What are the two important characteristics a good acceptance sampling plan should have ? **04**
  (c) Write note on Six sigma concept. **07**

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