Seat No.: _____   Enrolment No._____

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**

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

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 **07**
defects observed :

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 **07**
values of consumer's risk and producer's risk.

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 **04**
should have ?
(c) Write note on Six sigma concept. **07**

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