

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-IV (NEW) EXAMINATION – WINTER 2017****Subject Code: 2142905****Date: 17/11/2017****Subject Name: Statistical Quality Control & Textile Costing****Time: 02:30 PM TO 05:00 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) State the properties of normal distribution. **03**  
 (b) Discuss Binomial distribution briefly. **04**  
 (c) Find the mean and mode for the following classified data. **07**

Class	0-5	5-10	10-15	15-20	20-25	25-30
Frequency	2	4	4	6	5	3

- Q.2** (a) Define term: 1. Mean 2. Standard deviation 3. Coefficient of variation **03**  
 (b) Discuss Poisson distribution briefly. **04**  
 (c) Find out Quartile deviation of the following data and its relative measure. **07**

Value	10	15	20	25	30	35	40
Frequency	5	10	16	20	14	8	4

**OR**

- (c) Calculate the mean deviation of the following values about the mean and median in respect of the following data. **07**  
 18, 25, 63, 59, 29, 72, 17, 25, 105, 87
- Q.3** (a) Describe various types of scatter diagram. **03**  
 (b) What is correlation? Explain positive and negative correlation. **04**  
 (c) Compute Karl Pearson's coefficient of correlation from the following data of price of garment (in Rs.) and number of garments sold and comment on it. **07**

Price of garment	100	105	110	115	120	125	130
Number of garments sold	85	80	70	75	65	60	60

**OR**

- Q.3** (a) What is Break even analysis? **03**  
 (b) Explain briefly frequency distribution. **04**  
 (c) Following are the marks obtained by eight different students in the subjects of mathematics and the subject of statistics. **07**

Student no.	1	2	3	4	5	6	7	8
Marks in Mathematics	50	52	68	70	72	70	63	75
Marks in statistics	50	90	60	80	67	62	65	80

Calculate rank correlation coefficient using the above data and comment on it.

- Q.4** (a) State the factors affecting sampling. **03**  
 (b) Explain briefly control charts. **04**  
 (c) An experiment was conducted to study the effect of a dye produced by **07**

four different companies (A, B, C and D) on the strength of the fabric and following results were obtained.

	Dye			
	A	B	C	D
Fabric strength	250	225	250	300
	275	250	275	250
	275	225	250	275
	300	300	250	300

Carry out the analysis (One way ANOVA) of above data and write the conclusion. (Table value of F for 3, 12 degree of freedom at 5% level = 3.49)

**OR**

- Q.4** (a) What is DMAIC process? **03**  
 (b) Discuss different steps of DMAIC with suitable diagram. **04**  
 (c) An experiment was conducted to study the effect of the speed of the ring frame on the count of the yarn. The yarn was spun with four different speeds on three different ring frames and the results yarn counts are follows. **07**

		Speed (RPM)			
		15000	16000	17000	18000
Ring Frame	I	85	88	85	90
	II	70	85	90	95
	III	80	82	88	92

Carry out analysis of the above data and write the conclusions.  
 (Table value of F for 3, 6 degree of freedom at 5% level = 4.76)  
 (Table value of F for 2, 6 degree of freedom at 5% level = 5.14)

- Q.5** (a) Discuss labour cost in brief. **03**  
 (b) Discuss the significance of sampling. **04**  
 (c) Following data represents average and range of linear density of the yarn obtained from eight different samples each of size five, selected during a spinning process. **07**

Sample no.	1	2	3	4	5	6	7	8
Avg. linear density	19.6	20.1	20.5	19.4	22.3	21.7	20.3	19.9
Range	1.2	2.1	1.6	1.8	2.0	1.7	2.0	1.8

Draw the mean and range charts for the above data and comment on them. (Table value:  $A_2 = 0.577$ ,  $D_3 = 0$ ,  $D_4 = 2.115$ )

**OR**

- Q.5** (a) What is marginal costing? What is its importance? **03**  
 (b) Explain briefly the various elements of capital cost for textile mills. **04**  
 (c) A spinning mill is working with following mix: **07**

Cotton Variety	Proportion (%)	Cost/Kg. (in Rs.)
P1	10	4
P2	20	5
P3	30	6
P4	40	7

Calculate clean cotton cost/kg. If yarn realization is 88% & that out of the 25 kg lost per 100kg. put through, 8 kg. are saleable at 1.75 Rs./kg.

\*\*\*\*\*