

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-IV(New) EXAMINATION – SUMMER 2016

Subject Code:2142905**Date:01/06/2016****Subject Name:Statistical Quality Control & Textile Costing****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.

1.

MARKS**Q.1 Short Questions.****14**

- 1 Define the term mean.
- 2 Define the term class interval.
- 3 Find the median of the following data.
52,48,60,50,68,51,55,62,58
- 4 Define the term randomization.
- 5 List the name of variable charts.
- 6 Give the difference between p and np chart.
- 7 List down any two properties of normal distribution.
- 8 List the different types of cost.
- 9 Find the quartile (Q1) from the following observation.
29,12,26,19,24,36,21,33,35
- 10 Find the mode of the following data.
22.8, 23.2, 22.9, 22.6, 23.4, 23.0 ,23.1, 23.0, 22.9, 23.0
- 11 Find the range and coefficient of range of weights of 6 students from the following data. 45 kg, 46 kg, 50 kg, 48 kg, 55 kg, 46 kg
- 12 List the different terms used to indicate dispersion.
- 13 Define the term positive correlation.
- 14 Define the term assignable cause.

- Q.2 (a)** Find out Mean, Median, Mode and Quartile (Q1 & Q3) from the following data. **07**

Class	0-10	10-20	20-30	30-40	40-50
Frequency	18	30	46	34	22

- (b)** Explain objectives and characteristics of DMAIC with suitable diagram. **07**

OR

- (b)** Following are the marks obtained by eight different students in the subject of mathematics and the subject of statistics. **07**

Student no	1	2	3	4	5	6	7	8
Marks in mathematics	48	85	70	72	70	68	65	80
Marks in statistics	42	92	65	80	67	62	60	72

Calculate spearman's rank correlation coefficient using the above data.

- Q.3 (a)** Discuss Deming's 14 points of quality management. **07**

- (b)** The following data are related to the percentage of humidity and warp breakages rate recorded for a week in a loom shed. **07**

Percentage humidity	54	85	86	50	42	75	65	56
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Warp breakages rate	2.45	1.21	1.20	2.84	3.25	1.86	1.90	2.32
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Using above data find the two equations of lines of regression.
(X on Y & Y on X)

OR

- Q.3 (a)** What are overheads? Discuss various type of overhead briefly. **07**
(b) A Box contains 4 white and 3 black balls and another box contains 3 white and 4 black balls. If one ball is chosen at random from each box, then what is the probability that the balls will be of different colors? **07**

- Q.4 (a)** Samples of five ring bobbin each selected from a ring frame for eight shifts have shown following results of count of yarn. **07**

Sample no	1	2	3	4	5	6	7	8
Count of yarn	27.5	27.4	25.4	28.5	28.5	28.9	28.0	28.4
	28.5	26.9	26.9	28.0	29.0	29.5	28.5	28.5
	28.0	26.0	28.0	29.2	28.5	30.0	27.8	28.4
	26.9	28.7	26.7	29.0	28.5	29.4	28.0	28.0
	28.6	29.0	28.2	28.7	28.0	28.9	28.1	28.7

Draw X bar and R chart for the above and write conclusion about the state of the process. (Table value : $A_2 = 0.577$, $D_3=0$, $D_4 =2.12$)

- (b)** Calculate Karl Pearson's correlation coefficient from the following data. **07**

Wages	100	101	102	102	100	99	97	98	96	95
Cost of living index	98	99	99	97	95	92	95	94	90	91

OR

- Q.4 (a)** An experiment was carried out to study the effects of the speed of the ring frame on the number of end breakages and following results were obtained by taking five reading at each speed. (One way ANOVA) **07**

	Speed (rpm)			
	15000	16000	17000	18000
End breakages	18	22	23	30
	20	20	23	32
	18	21	25	28
	15	18	24	28
	17	23	23	35

Carry out analysis of the above data and write the conclusion.

[Table value of F for 3, 16 degree of freedom at 5% level = 3.24]

- (b)** Write short note on Probability and Non-Probability sampling. **07**

- Q.5 (a)** A 4X4 Latin square design was conducted to study the effects of four different dyes A, B, C and D on the strength of the fabric. To remove the variation of the laboratory and the operators four different operators conducted the experiment in four different laboratories and the results obtained are as follows. **08**

Lab	Operators			
	I	II	III	IV
I	66 (B)	74 (D)	70 (A)	72 (C)
II	75 (D)	68 (A)	68 (C)	65 (B)
III	69 (A)	72 (C)	63 (B)	75 (D)
IV	70 (C)	65 (B)	74 (D)	70 (A)

Carry out analysis of the above data and write the conclusion.

[Table value of F for 3, 6 degree of freedom at 5% level = 4.76]

- (b) Following data refers to spinning mill. Their product mix and rate/kg are as follows. **06**

Cotton variety	Proportion in %	Cost per kg in Rs.
A	9	7
B	84	6
C	7	4

Calculate clean cotton cost per kg, if yarn realization is 88% and that out of 12 kg loss per 100 kg, 8 kgs are saleable at Rs 2.15 per Kg.

OR

- Q.5** (a) State the properties and application of binomial distribution. **03**
(b) Write short note on Break even analysis. **04**
(b) Discuss labour cost and material cost in brief. **07**
