Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(New) • EXAMINATION – WINTER 2016

Subject Code:2142905 Date:21/11/2016

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 Short Questions. 14

1 Find the median of the following observation.
10,14,15,20

2 Write down formula of standard deviation & CV.

3 Define term class frequency.

4 List the different terms used to indicate dispersion.

5 List the different methods used to measure correlation.

6 What is negative correlation?

7 List the different types of graphical representations of the frequency distribution.

8 Write down properties of normal distribution.

9 Find the mode of following data.

X (Observation)	10	11	12	13	14
F (frequency)	2	4	6	8	6

10 Define the term chance cause.

11 What is control chart?

12 Write down formula for P.M.D (Percentage Mean Deviation)

13 List the different types of cost.

14 Define the term randomization.

Q.2 (a) Find out Q_1, Q_3, and P_{35} for the following frequency distribution. **07**

Class	30-34	35-39	40-44	45-49	50-54	55-59	60-64
Frequency	3	5	12	18	14	6	2

(b) The frequencies distribution of the net profit (lakh rupees) of 30 industries during the year 1999-2000 is as follow. Find the coefficient variation. **07**

New profit (lakh ruppes)	50-99	100-149	150-199	200-249	250-299	300-349	250-399
No of industries	7	9	4	4	2	2	2

OR

(b) Mean of the following frequencies distribution is 18.1. Find the missing frequencies. **07**

Class	5-10	10-15	15-20	20-25	25-30	30-35
Frequencies	11	20	35	20	?	6

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

(b) Write short note on DMAIC process. **07**

OR

Q.3 (a) Following are the marks obtained by ten different students in the subject of **07**

Physical testing and the subject of statistics.

Student	1	2	3	4	5	6	7	8	9	10
Physical testing	68	64	75	50	64	80	75	40	55	64
Statistics	62	58	68	45	81	60	68	48	50	70

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

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

X	4	5	7	9	10	11	13
Y	8	9	10	10	11	15	20.

Q.4 (a) Explain Binomial and poisson distribution with their properties **07**

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

OR

Q.4 (a) An experiment was carried out to study the effects of the speed of the ring frame on the count of the yarn. The yarn was spun with four different speeds on the three different ring frame and the results of yarn counts are as follow. (Two way ANOVA) **07**

	Speed (rpm)				
		15000	16000	17000	18000
R/F	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 conclusion.
[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]

(b) Following data represents average & 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
Average linear density	19.6	20.1	20.5	19.4	22.3	21.7	20.3	19.9
Range (R)	1.2	2.1	1.6	1.8	2.0	1.7	2.0	1.8

Draw X bar and R chart for the above and write conclusion about the state of the process. (Table value : A2 = 0.577 , D3=0, D4 =2.115)

Q.5 (a) **07**

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.

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. **07**

Cotton variety	Proportion in %	Cost per kg in Rs.
A	10	6
B	86	5
C	4	3

Calculate clean cotton cost per kg, if yarn realization is 87% and that out of 13 kg loss per 100 kg, 8 kgs are saleable at Rs 2.75 per Kg.

OR

Q.5 **(a)** What is quality? Explain different dimension of quality in detail. **07**

(b) Discuss labour cost and material cost in detail. **07**

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