Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – VI EXAMINATION – WINTER 2015

Subject Code:162901 **Date:15/12/ 2015**

Subject Name: Statistical Quality Control & Textile Costing

Time:2:30pm to 5:00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 A design was prepared to compare the performance of four mixings A, B, C, & D processed on four spindle sets. The allotment of treatment of different spindles was altered from day to day. 25 leas from each mixing were tested for strength every day. The average of these 25 leas is as given below: **14**

	Spindle Set			
Days	1	2	3	4
1	46.2 (A)	42.8(B)	43.4(C)	43.0(D)
2	43.2(D)	47.0(A)	41.8(B)	42.5(C)
3	44.0(C)	42.0(D)	46.5(A)	42.0(B)
4	43.0(B)	42.5(C)	41.6(D)	44.5(A)

(a) Identify the design
(b) Test whether four mixing differ in terms of lea strength
(c) Also check the effect of spindle and days on lea strength of four mixing.

Table values for FTest at 5% is 4.76 & 1% is 9.78

Q.2 (a) Define mean, SD and CV%. Calculate Mean, SD, Variance and CV% from following data: **07**

Defect per loom	0	1	2	3	4
Frequency	30	44	18	6	2

(b) Give formula for "inter quartile range". Quartile deviation and coefficient for QD. Find QD and its coefficient from following data: **07**

Roll No.	1	2	3	4	5	6	7
Marks	20	28	40	12	30	15	50

OR

(b) Define quartile deviation. If the mean and SD of normal distribution are 60 & 5 respectively, find inter quartile range and mean deviation of the distribution. **07**

Q.3 (a) (i) Define producer risk and consumer risk. **07**
(ii) Define replication and treatment.
(iii) State advantages of acceptance sampling

(b) The following table refers to the number of missing stitches noted during the inspection in the large garment manufacturing company. **07**

Garment No.	1	2	3	4	5	6	7
No. of missing stitches	8	15	15	19	9	15	9
Garment No.	8	9	10	11	12	13	14
No. of missing stitches	12	21	13	23	16	9	25
Garment No.	15	16	17	18	19	20	21

No. of missing stitches	15	10	10	12	15	9	10

Garment No.	22	23	24	25
No. of missing stitches	22	8	27	9

Draw the control chart for C

OR

Q.3 **(a)** Following data represents production of 30s cone by 3 workers. Conduct ANOVA for (Two way classification) **08**

	Machines		
Workers	A	B	C
X	16	64	40
Y	56	72	64
Z	12	56	28

(i) Test whether the mean productivity is the same for different machine types.

(ii) Test whether 3 workers differ with respect to mean productivity.

(b) Find the coefficient of correlation between ends/in (X) and picks per in (Y) from following data: **06**

X	23	27	28	28	29	30	31	33	35	36
Y	18	20	22	27	21	29	27	29	28	29

Q.4 **(a)** Give three properties of normal distribution. If mean count = 36.2sNe, SD=0.5, & no. of tests = 40, calculate: **07**

(i) No. of tests having count less than 35.5s

(ii) No. of tests having count more than 36.9s

(iii) No. of tests having count between 35.5 & 36.9

t table at -1.4 = 0.081 & at +1.4 = 0.919

(b) Two yarns are tested for lea strength and have given following results: **07**

	Yarn A	Yarn B
No. of tests	32	32
Mean lea strength(lbs)	58	65
SD	7.2	8.4

Is yarn B more variable than yarn A?

OR

Q.4 **(a)** A mill is spinning 30s count on two ring frames A & B. Calculate whether the count on these two ring frames is different or not statistically. **07**

Ring Frame	A	B
No. of tests	30	30
Mean Count	29.6	31.2
CV %	2.0 %	1.6 %
Table values	95 % limit	t = 1.96
	99 % limit	t = 2.56

(b) Particulars of two cotton plants are as below: **07**

	Plant A	Plant B
Mature fibres	260	335
Immature fibres	140	165

With the help of binomial distribution find out whether the maturity of plants is same or not.

X2 table values 5% = 3.84

1% = 6.63

Q.5 **(a)** Write a short note on break even analysis. **07**

(b) Calculate clean cotton cost, for spinning 40s Ne warp yarn, from the following data: **07**

Quality of cotton	Proportion	Rate per kg(Rs.)
(i) Type A	09 %	100
(ii) Type B	87%	90
(iii) Comber waste	04%	60

Yarn realization is 85 %. Out of 15 kg lost per every 100 kg production, 7 kg is saleable at Rs. 60 per kg.

OR

Q.5 **(a)** What is the effect of increasing sales cost, fixed cost & variable cost on P/V ratio and break even sales? **07**

A mill has two sorts. Calculate which is better from following data.

	Sort A	Sort B
Sales price(Rs./m)	30	60
Variable cost (Rs./m)	20	30
Time to produce 1 m cloth	30 min	180 min

(b) For textile mills, draw the flow chart for classification of cost by function. **07**

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