

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI • EXAMINATION – SUMMER 2013****Subject Code: 162901****Date: 24-05-2013****Subject Name: Statistical Quality Control and Textile Costing****Time: 10.30 am - 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.

- Q.1 (a)** State the properties and applications of Normal distribution and Binomial distribution. **07**
- (b)** i. Define mean, median and mode. State the relationship between them. **07**
 ii. Define treatment and replication.

- Q.2 (a)** The following table shows the scores of different group. Find the correlation coefficient between age and scores of the test. Also find coefficient of determination. **07**

Scores	Group			
	A	B	C	D
50-100	4	4	2	1
100-150	3	5	4	2
150-200	2	6	8	5
200-250	1	4	6	10

- (b)** Explain correlation. Write down different methods of studying correlation. Discuss in detail about scatter diagram method also write down merit and demerits of it. **07**

OR

- (b)** Two judges have given ranks to ten students for their honesty. Find the rank correlation coefficient. **07**

X	28	27	26	35	39	42	39	37	32	22
Y	40	42	38	49	40	50	38	44	45	36

- Q.3 (a)** Four mixing A, B, C and D were prepared and allocated at random on six different R.F. Conduct the analyses of variance (two-way classification) and give your conclusions. Figure in the table indicate leaf strength in lbs. Strength origin = 70 lbs. **07**

Mixing	Ring Frame					
	I	II	III	IV	V	VI
A	11	13	10	11	12	11
B	09	09	11	11	08	08
C	14	13	14	11	15	14
D	08	08	07	06	07	08

Table value:-

For 3 and 15 d.f. at 5% level is 3.29 and 1% level is 5.42

For 5 and 15 d.f. at 5% level is 2.9 and 1% level is 4.56

- (b) Mixing A, B, C and D were tested for lea strength. Every day 28 leas from each mixing were tested for lea strength and average of 25 leas test where as follows. A 4 x 4 latin square design was used. 07

Days	Spindle set			
	1	2	3	4
I	46.2(A)	42.8(B)	43.4(C)	43(D)
II	46.2(D)	47(A)	41.8(B)	42.5(C)
III	44(C)	42(D)	46.5(A)	42(B)
IV	43(B)	42.5(C)	41.6(D)	44.5(A)

Does mixing defer significantly in terms of lea strength? Also study the effect of days and spindle set on yarn strength offer your conclusion.(F table value for D.f. 3 and 6 5% lead 4.76 and 1% lead 9.78)

OR

- Q.3 (a) Conduct the analysis of variance (one-way classification) for the following data. 07
State whether the lea count differ between the bobbins:

Lea No.	Bobbin No.					
	I	II	III	IV	V	VI
A	42	43	44	41	40	39
B	41	40	42	43	44	39
C	40	39	41	40	42	43
D	38	44	40	39	42	44

Table value of F for 5, 18 d.f. at 5% level = 2.77 and 1% level = 4.25

- (b) Fibres from two plant A and B were tested for the maturity the results obtained are as follows: 07

Particular	Plant A	Plant B
(i) Matured fibre	260	335
(ii) Immature Fibre	140	165

Can we say that maturity is same in plant A and B?

The table value for X^2 at 5% level is 3.84 and at 1% level is 6.63.

- Q.4 (a) The sampling data of garment company is given. Draw X and R charts and decide whether the process may be regarded under control or not. 07

Sample No.	I	II	III	IV
1	30	38	42	50
2	20	30	18	42
3	22	32	36	40
4	50	40	30	25
5	28	42	35	25
6	48	22	20	30
7	32	32	42	42
8	36	34	35	37
9	31	48	51	71
10	20	22	24	31
11	22	33	44	55
12	72	62	65	25
13	18	68	74	50
14	14	18	52	62
15	60	62	65	63

[For n=4 $A_2 = 0.73$, $D_3 = 0$, $D_4 = 2.28$]

- (b) Daily 250 samples were collected for 10 days. The numbers of defective samples found are given below. Draw an appropriate control chart and report on the state of control. **07**

Date	1	2	3	4	5	6	7	8	9	10
Defects	18	25	38	39	29	60	52	12	29	25

OR

- Q.4 (a)** Explain marginal costing. What are the assumptions made in it? Give its advantages and limitations. **07**

- Q.4 (b)** The sales and profits during the two periods are given below **07**

Years	Sales(Rs.)	Profits(Rs.)
2011	2000000	200000
2012	3000000	400000

Calculate: - (i) Margin of safety at a profit of Rs. 450000,
(ii) variable cost in 2012,
(iii) Profit when sales are Rs. 4000000.

- Q.5 (a)** The following figures relates to the factory **07**

Fixed cost:- Rs. 400000 Variable cost/unit:- Rs. 10
Output:- 80000 units Selling price/unit:-20

- Draw a break even chart.
- If new selling price is Rs. 18/unit, what will be the new break even point?

- (b) Write in short on Textile Mill Budget planning explaining direct labour and direct material budgeting? State importance of department wise budgeting. **07**

OR

- Q.5 (a)** Describe different methods of costing. Explain scheme of Cost distribution in textile mill. **07**

- (b) Explain OC Curve. State advantages of acceptance sampling. List out different steps in planning of an experiment. **07**
