

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI • EXAMINATION – WINTER • 2014****Subject Code: 162901****Date: 26-11-2014****Subject Name: Statistical Quality Control and Textile Costing****Time: 02:30 pm - 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.

- Q.1 (a)** Find Range, Coefficient of range, Quartile deviation, Coefficient of Quartile deviation, Mean deviation and Coefficient of mean deviation from the following frequency distribution. **07**

Observation	1	3	5	6-8	8-12	12-16	16-22
Frequency	1	2	5	10	8	3	1

- (b)** Find Harmonic mean and geometric mean from the following data: **07**

Marks more than	80	70	60	50	40	30	20
No. of students	0	7	18	40	40	63	70

- Q.2 (a)** Find the mode for the following classified data: **07**

Class	30-39	20-29	15-19	10-14	7-9	4-6	3	2	1
Frequency	7	12	23	21	42	28	22	24	21

- (b)** Find the correlation coefficient between age of weavers and the number of accidents. Also find coefficient of determination. **07**

No. of accidents	Age of weavers				
	25-30	30-35	35-40	40-45	45-50
0	-	3	5	7	8
1	-	-	9	4	1
2	3	5	10	3	-
3	4	9	6	-	-
4	12	7	3	1	-

OR

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

X	60	72	42	40	45	50	60	51	66
Y	35	30	52	54	48	50	30	35	25

- Q.3 (a)** i. State the properties and applications of Binomial and poisson distribution. **05**

- ii. State the advantages of acceptance sampling. **02**

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

Lea No.	Bobbin No.					
	I	II	III	IV	V	VI
A	32	33	34	31	30	29
B	31	30	32	33	34	29
C	30	29	31	30	32	33
D	28	34	30	29	32	34

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

OR

- 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 lea strength in lbs. Strength origin = 70 lbs. **07**

R.F. No.	Mixing			
	A	B	C	D
I	21	19	24	18
II	23	19	23	18
III	20	21	24	17
IV	21	21	21	16
V	22	18	25	17
VI	21	18	24	18

Table value:-

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

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

- (b)** Mixing A, B, C & 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	67(A)	62(B)	62(C)	64(D)
II	62(D)	62(A)	63(B)	66(C)
III	63(C)	67(D)	63(A)	63(B)
IV	62(B)	63(C)	64(D)	63(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 & 6 5% lead 4.76 & 1% lead 9.78)

- Q.4 (a)** Daily 500 samples were collected for 15 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	11	12	13	14	15
Defects	18	25	38	39	29	60	52	12	29	25	85	65	80	60	32

- Q.4 (b)** A company manufacturing a single article sells it at Rs. 10/unit. The variable cost is Rs. 6/unit and fixed cost is Rs. 4000/annum. Calculate:- (1) P/V Ratio, (2) Break Even sales, (3) Margin of safety if total sales are Rs. 15000, (4) Sales required to earn a profit of Rs. 5000, (5) Amount of profit when sale is Rs. 15000. **07**

OR

- Q.4 (a)**
- Explain marginal costing. Give its advantages and limitations. **04**
 - Explain Break Even Chart. **03**

- Q.4 (b)** 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	230	238	242	250
2	220	230	218	242
3	222	232	236	240
4	250	240	230	225
5	228	242	235	225
6	248	222	220	230
7	232	232	242	242
8	236	234	235	237
9	231	248	251	271
10	220	222	224	231
11	222	233	244	255
12	272	262	265	225
13	218	268	274	250
14	214	218	252	262
15	260	262	265	263

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

- Q.5 (a)** The sales and profits during the two periods are given below **07**

Years	Sales(Rs.)	Profits(Rs.)
2013	240000	18000
2014	280000	26000

Calculate: - (i) Profit/Volume ratio. (ii) Amount of sales at Break point.
(iii) Profit when sales are Rs. 250000. (iv) Margin of safety in 2014.

- (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)** i. Describe different methods of costing. **07**

ii. Explain Margin of Safety, Contribution to Sales Ratio and Marginal Costing.

- (b)** i. Explain scheme of Cost distribution in textile mill. **07**

ii. Calculate Margin of safety from the following data.

Fixed expenses - Rs. 22,500, Sales value - Rs. 75,000, Profit - Rs. 15,000.
