[Total No. of Questions - 9] [Total No. of Printed Pages - 4]

Dec.-22-0340

TE-704 (Statistics and Quality Control for Textile Industry)

B.Tech. 7th (CBCS)

Time : 3 Hours **Max. Marks : 60**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt Five questions in all, selecting one question from each Section A, B, C and D. Q. No. 9 is compulsory.

SECTION - A

1. Define quality and its importance. Describe Deming's fourteen points of quality. (10)

2. Define Quality Control. Explain various tools of quality control. (10)

SECTION - B

3. A marketing company procures an order from two textile garment manufacturing companies. In order to check the quality provided by the suppliers test samples from the two consignment provided by the suppliers from the first company's consignment, the sample consisting 20 fabrics, was taken. It had variance of 25 grams. The other company's sample of 24 had 14.1 gram variance. Whether there is a higher variation in the two company's consignment? (10)

4. Explain classification of data. Also explain discrete and continuous vaiables with examples. (10)

SECTION - C

5. The data below relate the thickness loss during calendaring of

a viscose needle-punched fabric and the load on the calender bowl.

Load (tons)	0.5	1.0	1.5	2.0	2.5	3.0
Thickness loss (%)	4	13	14	20	24	33

Find out :

(a) If there is any linear relationship among the two variables.

(b) The strength of relationship in terms of 'r' and F value due to regression.

(c) Standard error of the regression equation.

(d) Find out range of thickness loss data for a load value of 2.3 tons. (3+2+3+2=10)

6. The quality control department is looking at the impact of treatment time (min) temperature (°C) and concentration of chemicals (%) on fabric feel. The finished cloth was compared to a standard and a numerical score was assigned as given below. Analyze the data and draw conclusions at the significance level of 0.5 : (10)

0	Temperature (°C)			
	250		300	
	Conc. 5%	Conc. 10%	Conc. 5%	Conc. 10%
40	23,27	24,29	24,23	30,34
50	26,28	31,34	30,32	40,42

SECTION - D

7. The yarn linear density (Tex) results for 10 cones based on five observations in each case presented below :

Cone No.	Yarn linear density (tex)				
	1	2	3	4	5
1	22.1	23.2	24.1	23.2	22.2
2	23.2	25.2	24.2	23.8	22.6
3	22.6	24.8	24.5	25.6	23.6
4	24.5	25.1	23.2	23.3	22.9
5	23.2	24.2	23.6	23.7	23.8
6	22.6	23.2	24.1	25.1	22.6
7	22.7	22.6	24.1	23.7	22.7
8	23.5	23.3	22.7	22.9	22.6
9	23.8	22.6	26.6	24.6	25.1
10	24.1	22.7	23.6	23.9	24.1

Find out control chart for average and range indicating action and warning limits. State what action is needed if any data falls between action and warning limits. Also state the utility of average and range chart. (10)

8. A process is controlled with a fraction non-conforming control chart with three sigma limits n=100, UCL = 0.161, central line = 0.080 and LCL = 0. Find the equivalent control chart for the number non-conforming. (10)

(Compulsory Question)

9. Aattempt *eight* questios.

(a) Define Quality Function Deployment and Quality Cost.

(b) What do you understand by revised ISO 9000 series standard?

(c) Show how *t*-distribution varies depending on sample size.

(d) Define total quality management (TQM). Briefly state its basic objectives.

(e) Define Standard Error. How is it useful?

(f) The mean and variance of a random variable X having binomial distribution are 4 and 2 respectively, then find out P (X = 1).

(g) State objectives of control charts.

(h) From a population of VA is the standard deviation of 100 data of 100, 101, 102, ...VB is the standard deviation of 100 data of 150, 151, 152.....From another population; then the find out the ratio of-the variance.

(i) The number of neps in a carded web follows Poisson distribution with a mean of 100 per m^2. Find out the probability that there is no nep in an area of 645 cm^2.

(8×2.5=20)