Roll No. | | | | | | | | | | | | | Total No. of Pages : 03

Total No. of Questions : 09

B.Tech.(Textile) (2011 Onwards) (Sem.–6)

STATISTICAL METHODS & QUALITY CONTROL IN TEXTILES

Subject Code : BTTE-604

M.Code : 71738

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

a) State the seven tools of quality suggested by Dr. Kaoru Ishikawa.

b) Define Total Quality Management (TQM). Briefly state its basic objectives.

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

d) Define standard error. How it is useful?

e) Show how t distribution varies depending on sample size.

f) Exhibit the nature of χ^2 distribution curve. What is the utility of χ^2 distribution?

g) State the objectives of control charts.

h) State when modified control limits for averages should be used? How it is different from conventional control charts.

i) Distinguish between binomial and Poisson's distribution with illustration.

j) Distinguish between producers risk and customer risk. How to make balance between the above risks?

SECTION-B

2. The distribution of the masses of a certain type of garment is known to be approximately normal with a SD of 6 g. It is required that not more from 1% of the garment produced should have a mass less than 213g. What should be the average mass of garments, correct to the nearest gram? Assuming the garments are made with this average mass, what proportion of garment will have masses between 298g and 233g.

3. A random sample of 500 garments was chosen from a production line, and 25 of them were found to be 'seconds'. Calculate 95% confidence limits for the proportion of 'seconds' produced by the line.

4. From the blend analysis at three different places of yarn, the following results were obtained.

Polyster/Cotton	Section I	Section II	Section III
	67:33	64:34	70:30

Did the proportion differ significantly from the nominal value of 65:35?

5. To estimate the mean count of a delivery of yarn, five standard count tests were carried out, with the following results (tex).

Tex values: 41.3, 41.1, 40.9, 41.2 and 41.3

Calculate the 95% confidence limits for the mean count. If it was required to estimate the mean count to within 0.15 tex, how many tests should be carried out?

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

SECTION-C

7. The yarn linear density (tex) results for 10cones based on five observations in each case are 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. 5+1+4

8. 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 0.05. 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

9. The following data were obtained in an experiment to investigate the relation between the tenacity of a sliver and processing speed at breaker draw frame.

Speed (m/min)	200	300	400	600	1000
Tenacity (gf/tex)	0.0152	0.0156	0.0162	0.0181	0.0194

Calculate the equation of the regression of tenacity on the speed and find 95% confidence limit for the mean tenacity when the speed is 500 m/min. Also find our correlation coefficient between the above variables and standard error of equation. 10

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.