B. Tech.
(SEM. IV) EXAMINATION, 2006-07
STATISTICS & TEXTILE TESTING - I

Time : 3 Hours] [Total Marks : 100

Notes : (1) Attempt all questions.
(2) All questions carry equal marks.

1 Attempt any four of the following. 5x4=20

(a) Differentiate between an attribute and a variable.

(b) Discuss “Bimodal Distribution Curve” with a suitable example.

(c) Six yarn samples were tested for ‘Single yarn Strength’ in grams and values were found as below:
160, 156, 180, 172, 168, 174
Find out the value of ‘Median’.

(d) Differentiate “Frequency Polygon’ from ‘Histogram’ by a suitable example.

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(e) Two samples of sizes 36 and 48 have means 42.0 and 40.0. Find out the standard deviation of the combined sample (consider \( d_1 = 6, d_2 = 8 \)).

(f) Define “Coeff. of Variation”. Suppose, mean strength and strength CV% of a yarn sample are 4 kgf and 16% respectively. Calculate the standard deviation.

2 Attempt any **two** of the following: \(10 \times 2 = 20\)

(a) Describe in detail, how control charts help in Quality Control of a spinning mill.

(b) Distinguish between ‘Assignable’ and ‘Non-assignable’ causes. Explain ‘Acceptable Quality Level’ (AQL) and ‘Operating Characteristic Curve’ (OC) in connection with sampling inspection plan.

(c) Differentiate between “Specification limit” and ‘control limit’. Also explain how ‘product control’ is different from ‘process control’?

3 Attempt any **two** of the following: \(10 \times 2 = 20\)

(a) Discuss the ‘Hysteresis Effect’ in relation to Moisture Absorption of Textiles. Deduce the moisture regain of the fabric made up of 60% cotton, 30% polyester and 10% polypropylene in standard conditions.

(b) Differentiate between ‘Random Sample’ and ‘Biased Sample’. Discuss in detail, the ‘Zoning Technique’ for Raw cotton.
(c) Explain the principle of ‘Air flow Method’ for measuring the fineness of a fibre. What are the precautions to be taken care of, while using air flow methods for testing?

4 Attempt ‘any two’ of the following: 10x2=20

(a) Draw a ‘Comb-Sorter Diagram’ for cotton and analyse ‘Effective length’ and ‘Short fibre %’ with the help of this diagram.

(b) Analyse the ‘fibrograph’ curve in terms of ‘Upper Half Mean Length’ and ‘Uniformity Ratio’.

(c) Define ‘Maturity Ratio’. Discuss any test for maturity measurement.

5 Attempt any two of the following: 10x2=20

(a) Define any four of the following terms:
(i) Mass Stress
(ii) Initial Young’s Modulus
(iii) Tenacity
(iv) Work of Rupture
(v) Yield point

(b) Discuss the different features of HVI. Write the usefulness of this instrument in fibre selection.

(c) Describe the working principle of any ‘fibre bundle strength tester’.