

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE SEM-VI Regular Examination May 2011****Subject code: 162903****Subject Name: Physical Testing****Date: 19/05/2011****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)** Why microgram per inch is used for cotton while micron for wool? Explain air flow principle through porous cotton sample. Also establish relationship between specific surface and diameter of fiber. **07**

**(b)** Answer following **07**

- i) Give equation of mass in denier with reference to measurement of fineness by vibration method. Give modified equation taking Young's modulus values. Draw diagram if necessary.
- ii) With equation show how immaturity count and fiber weight are related. What are the minimum and maximum values of maturity ratio?

**Q.2 (a)** Explain concept of span length. With the help of the fibrograph explain 50% SL, 2.5% SL, ML, UHML, Uniformity ratio and Uniformity index. **07**

**(b)** With a sketch explain the working principle of Untwist- Retwist type twist tester. **07**

**OR**

**(b)** What is meant by bulk, stretch and modified stretch yarns? Explain HATRA crimp rigidity test in detail. **07**

**Q.3 (a)** Explain cantilever principle based stiffness tester. How bending length, flexural rigidity and bending modulus are calculated from the result? **09**

**(b)** Define air permeability, air resistance and air porosity. With graph explain relationship between air permeability and cloth cover. **05**

**OR**

**Q.3 (a)** Discuss in detail Bundesmann water repellency test. What are the values determined from the test? **08**

**(b)** Write in short on Shirley crease recovery test. **06**

**Q.4 (a)** Write a short note on effect of gauge length and speed of testing on tensile strength result. Derive equations for the same. **07**

**(b)** Give answers of the following **07**

- i) Is it possible to test specimen under CRL and CRE on Cambridge Extensometer? How?
- ii) What is meant by CRL, CRE, CRT and CRS?

**OR**

**Q.4 (a)** Discuss in detail working of Single thread strength tester based on CRL. **09**

**(b)** Write in short on following terms: **05**

- i) Modulus & Yield point
- ii) Fabric assistance

- Q.5 (a)** What is meant by addition of irregularity and effect of doubling? **05**  
Calculate drawn sliver CV% on a draw frame from following data.  
Undrawn Sliver CV%: 2.4 Draw Frame CV% : 3.8
- (b)** Answer following: **09**
- i) Which Statistical measures are used to analyze periodic and non periodic forms of yarn unevenness?
  - ii) For cotton yarns find out actual yarn CV% from following data:  
Count : 17 Tex Fiber weight : 181 mtex I : 2.35
  - iii) Draw the graph of yarn evenness if it has constant short term variation with a long term mean variation. What is called normal and inert test?

**OR**

- Q.5** Write in detail on features of USTER evenness tester. **14**

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