

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY****B.E. - SEMESTER – VIII EXAMINATION – OCTOBER 2012****Subject code: 182901****Date: 27/10/2012****Subject Name: Principles of Textile Process****Time: 02.30pm - 05.00pm****Total Marks: 70****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Discuss the factors which influence uniform acceleration during picking. 'Modern high speed looms require modified shape of picking cam.' Explain with help of suitable mathematical analysis. **07**
- (b) Derive an equation of yarn tension at any radius 'r'. **07**
- Q.2** (a) Explain the terms effective inertia of sley & radius of gyration. Define the equation for effective inertia of sley for a loom having motor speed of  $N_m$  rpm & crank shaft speed  $N$  rpm. **07**
- (b) Derive an equation for traveler speed. Calculate the traveler speed with the following: **07**  
Package radius – 2cms, Spindle speed – 12000 rpm, T.P.I - 20
- OR**
- (b) Why one should study the behavior of floating fibre during drafting? Also derive the equation of drafting force on a draw frame. **07**
- Q.3** (a) Using instantaneous centre method, derive equation for sley velocity, average sley velocity & sley acceleration at front & back centres. State the types of curves obtained. **07**
- (b) i. Explain 'Alacrity' with respect to picking mechanism. **07**  
ii. Write in short on 'Power required for picking'.
- OR**
- Q.3** (a) Explain interrelationship between shedding and beating. Define shuttle interference. Derive an equation for shed opening at front wall of shuttle. **07**
- (b) Derive the terms kinematics & dynamics. Explain motion of sley with various factors affecting on it. Discuss importance of slay eccentricity ratio & its effect on loom design. **07**
- Q.4** (a) Discuss the significance of % ash content, % moisture content on trash and cleaning efficiency of a blow room. **07**
- (b) Fibre length distribution at front roller of a draw frame is as follows: **07**
- |                            |    |    |    |   |   |       |
|----------------------------|----|----|----|---|---|-------|
| Length of fibre in cms (I) | 5  | 4  | 3  | 2 | 1 | Total |
| No. of fibres (frequency)  | 10 | 14 | 10 | 8 | 8 | 50    |
- If force required withdrawing single fibre from bundle is 2.5gm and there are 4500 fibres entering from back roller and draft employed is 12. Calculate drafting force required to draft the material.
- OR**
- Q.4** (a) Explain trailing hook formation mechanism on a card. **07**
- Q.4** (b) Discuss in detail the causes of end breaks in ring frame yarn. **07**
- Q.5** (a) Discuss Shuttle Acceleration during picking. **07**
- (b) Discuss the methods used for optimizing the yarn content in ring frame package. **07**
- OR**
- Q.5** (a) Derive the formula for friction forces in negative let off motion also discuss design of let off mechanism. **07**
- (b) Discuss comber fraction efficiency. **07**

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