

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII • EXAMINATION – SUMMER 2014****Subject Code: 182901****Date: 05-06-2014****Subject Name: Principles of Textile Process****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) Derive the formula for friction forces in negative let off motion also discuss design of let off mechanism. **07**

(b) Calculate drafting force required to draft the material, if the fibre length at front roller of draw frame is as follows: **07**

Fibre length in cm	6	5.9	5.8	5.7	5.6	Total
Fibre flux	10	9	10	8	8	45

Single fibre withdrawal force – 1 gm

No. of fibres entering from back roller – 3000

Total draft – 12

Q.2 (a) Discuss Shuttle Acceleration during picking. **07**

(b) What is perfect drafting? Why it is not achieved on conventional draw frame? Explain the Foster's theory for perfect drafting. **07**

OR

(b) Elaborately discuss the effect of cylinder loading on hook formation at cotton card. **07**

Q.3 (a) Using instantaneous centre method, derive equations for sley velocity at front & back centers and average sley velocity. Find sley velocity from following:- **07**

 $l = 40 \text{ cm}$, $\beta = 0.4$, $\theta = 10^\circ$, $N = 200 \text{ rpm}$

(b) i. Explain in wider loom picking is limit while in narrow loom checking is limit. **07**
ii. Discuss factors affecting velocity of the shuttle on a loom.

OR

Q.3 (a) Discuss on forces required to drive the sley. **07**

(b) Derive the relation between shuttle velocity, loom speed & weft insertion rate. **07**

Find average shuttle velocity in mt/sec from the following :-

Width of warp in reed = 105 cm, Shuttle length = 12", Length of taper = 3.50 cm,

Loom speed = 210 rpm, θ° available = 110°

Q.4 (a) Derive an equation for power required for picking. Calculate work done per pick and power required for picking from the following:- **07**

Loom speed -220 ppm, Reed width -120 cm, Length of shuttle – 30 cm, $\theta = 135^\circ$,

Wt. of shuttle – 480 gms

(b) What are the reasons of end breaks at ring frame? Discuss it. **07**

OR

Q.4 (a) Discuss the factors which influence uniform acceleration during picking. What considerations are involved in the design of picking cam? **07**

(b) What is coil ratio? How does it affect the yarn content on ring spun package? Also explain the working of D.P.M cam developed by ATIRA. **07**

- Q.5 (a)** Which factors affect drafting force? Derive an equation of yarn tension in balloon zone at ring frame. **07**
- (b)** Derive an equation of yarn air drag force from lappet guide to package at ring frame. **07**
- OR**
- Q.5 (a)** Discuss the effects of genetic and ginning conditions on seed coat generation. Why imported cottons perform well in blow room? **07**
- (b)** Explain the significance of fibre acceleration behind top comb and discuss its influence on short fibre removal and long fibre loss during combing. **07**
