Seat No.: _____ Enrolment No._____

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**
$l = 40$ cm, $\beta = 0.4$, $\theta = 10^\circ$, N= 200 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 form 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**

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