Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2014

Subject code: 1722501 Date: 16-06-2014

Subject Name: Theory and Design of Textile Machines - II

Time: 02:30 pm - 05:00 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 Calculate following: **14**

(i) Multicoloured warps of 60s Nm spun yarns are wound on a horizontal section of 1.5 m diameter, on which inclines are fixed at 14 degrees to the axis. Each warp is 3200 m long and 2 m wide and contains 6700 ends. Warp density on drum is 0.67 g/cm3. Determine the depth of yarn on drum when the warp is completed and the corresponding reed traverse per section.

(ii) Find the eccentricity ratio e (r/l) for a beat up mechanism having sley velocity 0.99 m/sec and crank velocity 132 cm/sec at 30 degrees of crank rotation.

(iii) What is meant by nominal and actual picker displacement? Calculate force exerted by the picker(for manual running and full speed running) on the shuttle from following data:

Swell pressure on back wall of shuttle: 60 N

Coefficient of friction: 0.22 Mass of shuttle: 0.97 lbs

Speed of shuttle: 13.0 m/s Distance : 0.175 m

Q.2 **(a)** With special reference to narrow fabric weaving, what are the effects of pick spacing and warp tension on beat-up force? **07**

(b) What is the effect of pre-wetting on speed of the sizing machine and on size structure in yarn? **07**

OR

(b) How starting mark (Set marks) defect originate on loom? Explain for different let off mechanisms. **07**

Q.3 **(a)** While considering parameters affecting selection of modern looms, discuss effect of following parameters on performance: **07**

(i) Influence of warp length (ii) effect of raw material cost.

(b) Compare performance of cycloidal cam to SHM cam in terms of warp breakages and warp tension. **07**

OR

Q.3 Show general features of shed-shape characteristics taking a hypothetical example. Also draw shed-shape graphs for a loom having sley and heald dwell for shed crossing at 270 and 360 degrees. **14**

Q.4 **(a)** Draw sketches of four bar, six bar and conjugate cam type beat-up mechanisms. What are the important design conclusions related with all three mechanisms? **07**

(b) Discuss in short the influence of warp loading on weaving machines upon yarn deformation. **07**

OR

Q.4 **(a)** Write in short on effect of shed formation on warp tension. **07**

	(b)	Compare multiphase wave shed weaving process with conventional shuttleless looms with respect to warp and weft tension phenomenon.	**07**
Q.5	**(a)**	Show graphs of characteristic weft thread load profile of rapier, air jet and projectile systems. Discuss any one briefly.	**07**
	(b)	Write in short on effect of relay nozzle diameter and blowing time on loom performance.	**07**

OR

Q.5	**(a)**	With reference to main nozzle design of an air jet loom, define various zones of air flow.	**07**
	(b)	Write on various equations of air drag acting parallel and perpendicular to yarn axis on an air jet loom.	**07**

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