

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
