Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. Sem. – II[nd] - Examination – June/July- 2011

Subject code: 1722501

Subject Name: Theory and Design of Textile Machinery-II

Date:22/06/2011 **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)**	While considering parameters affecting selection of modern looms, discuss effect of following on performance: (i) Influence of warp length (ii) Flexibility	**07**
	(b)	Compare stress on the weft yarn with reference to projectile, air jet and rapier looms.	**07**
Q.2	**(a)**	Which factors affect the yarn stresses in warping and beaming? Discuss any two in detail.	**07**
	(b)	While considering polytropic air flow, define different zones of the main nozzle design.	**07**
		OR	
	(b)	What is the effect of sizing on abrasion resistance and tensile strength of yarn?	**07**
Q.3	**(a)**	With reference to EYC, discuss LD Short and LD Long settings in detail.	**08**
	(b)	Multicoloured warps of a 50s Nm spun yarns are wound on a horizontal section warping drum of 1.5 m diameter, on which inclines are fixed at 15 deg to the axis. Each warp is 3000 m long and 2 m wide and contains 6500 ends. Warp density on drum is 0.6 g/cm3. Determine the depth of yarn on drum when the warp is completed and the corresponding reed traverse per section.	**06**
		OR	
Q.3	**(a)**	Derive the equation for the ratio of warp tension (T_2) to the applied force (F) for the non rotating back rest which gives minimum tension. Draw the graph taking the value of coefficient of friction as 0.25	**07**
	(b)	Write briefly on cloth fell position.	**07**
Q.4		Taking a hypothetical example, show general features of shed-shape characteristics taking reed displacement angle versus shed angle. Also draw only shed-shape for a loom having no dwell and having shed crossing at 330 and 270 degrees.	**14**
		OR	
Q.4		Write on various equations for axial and transverse air flows acting on the weft yarn on air jet loom. Also write on equation taking in to consideration complex yarn structure.	**14**

Q.5 **(a)** For Straight line-Nominal movement type of picking cam, prove that **07**

(Effective picker stroke) $= \frac{p\omega\pi}{n} = \frac{x_{max}\pi}{2n}$

(with usual notations)

(b) Show that for a freely rotating back roller of sensitive back rest, the ratio of warp tension (T) to the applied force (F) is **07**

$0.5 \sec^2\alpha$, when $\theta = 90^\circ$

(with usual notations)

OR

Q.5 Give answers of the following. **14**

(i) 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: 0.26 Mass of shuttle: 1 lbs
Speed of shuttle: 13 m/s Distance : 0.22 m

(ii) What is the effect of diameter and blowing time of relay nozzle on air consumption on an air jet loom?

(iii) For a shuttle loom, calculate maximum permissible loom speed from following data:
Effective reed space: 54" Average shuttle speed : 12 m/s
Duration of picking:135 deg Effective length of shuttle: 30 cm

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