

2012

**FABRIC FORMATION-I**

*Time Allotted : 3 Hours*

*Full Marks : 70*

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

**GROUP – A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for the following :

10X1 = 10

i) Gain in precision winding be defined as

- a)  $g = \text{yarn diameter}/\sin(\text{angle of wind})$
- b)  $g = \text{yarn diameter}/\cos(\text{angle of wind})$
- c)  $g = \text{yarn diameter}/\sin(2 \text{ angle of wind})$
- d)  $g = \text{yarn diameter}/\tan(\text{angle of wind})$ .

ii) In random winding the winding ratio

- a) decreases as the package builds up
- b) increases as the package builds up
- c) remains same as the package builds up
- d) increases during patterning as the package builds up.

iii) With the desirable chase angle (  $\theta$  ), the empty pirn diameter (  $d$  ) and the maximum yarn diameter (  $D$  ) being known for a specific yarn, if is possible to determine the chase length (  $C$  ) as

- a)  $C = \tan \theta - (D - d)/2$
- b)  $C = 2 \tan \theta - (D - d)/2$

c)  $C = \tan^{-1} (D - d)$

d)  $C = \tan^{-2} (D - d)$ .

iv) For direct warping a major problem in creeling is the amount of time required at the end of a run regarding replenishment and in all the creel systems available the most efficient one for short runs is

a) duplicate creel b) magazine creel

c) truck creel d) reversible creel.

v) To achieve the incline or wedge in section warping, it is necessary for either the mill or the headstock to move sideways. The rate at which this movement occurs is dependent on the angle of incline ( $\theta$ ), the thread spacing and the depth of yarn ( $D$ ) to be placed on to the mill hence

a) total traverse per section =  $2D/\tan \theta$

b) total traverse per section =  $D/2 \tan \theta$

c) total traverse per section =  $D/\tan \theta$

d) total traverse per section =  $D \tan \theta$ .

vi) If a cone is wound on a cylindrical drum, it will be obvious that at only one point between nose and the base can it be driven without slip. That point is about

a) 1/3 away from the base

b) 2/3 away from the base

c) 1/2 away from the base

d) 3/4 away from the base.

vii) If the angle of wind is ( $\theta$ ), winding travers is ( $H$ ) and the package diameter is ( $d$ ), then winding ratio ( $w$ ) is defined as the number of package revolutions per double traverse of the thread so as to write

a)  $W = 2H/(3 d \tan \alpha)$

b)  $W = H/(3 d \tan \alpha)$

c)  $W = 2H/(d \tan \alpha)$

d)  $W = 2H/(2 d \tan \alpha)$ .

viii) The Uster classmate system counts and classifies the imperfections in yarn into several groups varying systematically in cross-sectional area and length of fault. In general the number of groups is

a) 30 b) 40

c) 27 d) 23.

ix) The modern cold sizing process treats the warp gently without squeezing. The main advantage of this process can be said to be

a) less liquor pick up, high liquor concentration and saving in energy

b) less machine space, low liquor concentration and saving in energy

c) less liquor pick up, less liquor concentration and higher modularity

d) high liquor pick up, high liquor concentration and saving in energy.

x) The number of kg of paste on 100 kg of oven dry yarn as it leaves the tip of the squeeze rollers can be defined as

a) % size

b) % pick-up

c) % concentration

d) % cover.

**GROUP – B**

**( Short Answer Type Questions )**

Answer any *three* of the following.  $3 \times 5 = 15$

2. Define the following : 5X1

- a) Angle of wind
- b) stepped precision winding
- c) Gain
- d) Traverse ratio
- e) Size percentage.

3. A cylindrical package is wound on centre of 5 cm diameter. The spindle speed is constant at 3200 rev/min. If the traverse velocity is 205 m/min., determine the net winding rate at the start of winding.

4. A full beam of 30 tex cotton yarn is 24000 m in length and contains 420 ends. At a warping speed ( exclusive of stoppages ) of 600 m/min, the end breakage rate is 0.4 per 1000 ends per 100 m warped, the stopped time for repair being 0.9 min per break. Each beam change takes 5 min, and every beam plus creel change takes 15 mins. If the supply package contains sufficient yarn for three beams, determine running efficiency.

5. A cone is wound by driving it through surface contact with a revolving roller, grooved to traverse the yarn. The roller is of 3 in. dia and its speed is 3000 revs/min. If 54 in. of yarn is wound per double traverse and there are 6 complete spirals in the traverse groove, find the average winding speed and compare with the roller surface speed. The cone is 1 in. to 3 in. dia. at the start and 4 in. to 6 in. dia at full cone. What are the highest and lowest winding rates at the start and at full cone. Ignore coil angle.

## GROUP – C

### ( Long Answer Type Questions )

Answer any *three* of the following.  $3 \times 15 = 45$

6. What are the basic purposes of Re-winding ? What do you mean by precision winding and random winding ? Give a comparative table for them. How do you explain the patterning in winding ?

1 + 2 + 10 + 2

7. What are the needs of yarn tensioning and yarn clearing devices in winding ? Explain the principle of a self compensating tensioner. Describe in brief the operating principle of a yarn clearing device used on modern machines.

1 + 4 + 10

8. What do you mean by warping ? Under what circumstances would you suggest the use of sectional warping ? Explain the working of sectional warping machine with neat sketches.

2 + 3 + 10

9. What are the stretching zones of a sizing machine ? How is stretching controlled in a modern sizing machine ? What are the ingredients that can be used for sizing a 100% cotton sort ? Explain in brief the functions of each ingredient separately.

1 + 3 + 6 + 5

10. What are the needs of yarn clearing devices in winding ? Explain the principle of an electronic yarn clearing system used in winding. Describe in brief the Uster classmate system of yarn classification.

2 + 5 + 8

11. Why is pirn winding tension so important ? Show only with sketches the features of three basic types of pirns in common use. Describe with a neat schematic diagram the principle of pirn winding on a modern machine.

2 + 3 + 10