

CS/B.Tech-TT(NEW)/SEM-6/TT-602/2013

2013

FABRIC FORMATION-III

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 any *ten* of the following :

10X1 = 10

i) The sulzer projectile loom is a

- a) multi-projectile loom
- b) bi-projectile loom
- c) mono-projectile loom
- d) non-projectile loom.

ii) The machine used in stitch bonding is basically a modified

- a) warp knitting machine
- b) sewing machine
- c) weft knitting machine
- d) needle punching machine.

iii) To obtain a closer pick spacing, in Sulzer projectile loom the back rest is raised above its normal position and the arrangement is called

- a) shed splitting b) shed troughing
- c) shed staggering d) shed matching.

iv) In a modern beat up mechanism a conjugate cam is

used because

- a) it is noiseless
 - b) it can be sealed in a cover
 - c) there is no play
 - d) it is more robust in nature.
- v) The weaving resistance, which is equal and opposite to beat up force, is proportional to
- a) displacement of the fell
 - b) maximum warp tension
 - c) basic warp tension
 - d) angle of beat-up.
- vi) The success of a loom mainly depends on
- a) quality, productivity, versatility and its effect on environment
 - b) productivity, versatility, automation and its effect on environment
 - c) quality, productivity, versatility and ergonomics
 - d) productivity, flexibility, automation and quality.
- vii) As the latch needle head approaches the sinker or verge level, the old loop slides off the needle and the new loop is drawn through it and the operation is called
- a) loop formation b) casting-off
 - c) tucking d) hook closing.
- viii) Weft accumulator is used for
- a) Measuring weft
 - b) Maintaining weft tension
 - c) Pick finding
 - d) None of these.
- ix) Use of which type of cam is mandatory to produce any

weft knitted design ?

- a) Knit cam b) Tuck cam
- c) Miss cam d) Stitch control cam.

x) Which of the following processes is relevant to 'Sonic bonding' ?

- a) Hydroentanglement bonding
- b) Stitch bonding
- c) Thermal bonding
- d) Chemical bonding.

xi) Web formation is done by the flow of hot air in which of the following cases ?

- a) Spun bonding process
- b) Melt-blown process
- c) Needle punching process
- d) Carding process.

xii) Spunlace' technology is related to which of the following bonding techniques ?

- a) Hydroentanglement bonding
- b) Spun bonding
- c) Thermal bonding
- d) Mechanical bonding.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3X5 = 15

2. A rapier loom having a reed space of 180 cm and running at 225 picks/min will not have excessive velocities if the rapier is made to enter the shed at 60° and leave at 300°. Find out the maximum velocity of the weft for both the Dewas and Gabler system of operation. (Assume that the rapiers runs

on a cycloidal drive).

3. On a shuttle-less loom weaving a cloth having a read width of 225 cm, the weft projectile travels a total distance of 250 cm at an average velocity of 25 m/sec. If the period during which it is in motion occupies 0.4 of the loom cycle, calculate the rate of weft insertion in metres per minute if the overall running efficiency of the loom is 80%.

4. Why are water-jet looms not suitable for producing cotton fabrics ? If, in a water jet loom the consumption of water is proportional to the loom width, how many litres per hour would be consumed on a loom 200 cm wide, running at 500 picks per minute, if a loom 125 cm wide consumes 0.5 ml of water per pick ? 2 + 3

5. What are the different types of stitches that are produced in weft knitting ? Explain, how they are formed during fabric formation.

6. Although Rib and Interlock machines belong to double jersey weft knitting machines, how they are different ?

7. Make a comparative study between mechanically bonded and chemically bonded fabrics.

GROUP – C

(Long Answer Type Questions)

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

8. a) What are the special features of pirns for automatic looms ?

b) What is bunch length and which factors are considered for estimating bunch length and why ?

c) Describe the mechanism of a weft feeler which would be suitable to use for wide varieties of weft yarns on

pirn changing automatic looms.

3 + 4 + 8

9. a) In torsion bar picking system, picking force does not depend on the loom speed. How this is achieved in the picking system on a projectile loom ?

b) Why weft yarn buckles during picking in air-jet loom and how it can be avoided ? 10 + 5

10. a) What are the essential requirements for successful airjet weft insertion ? 5

b) "The problem with air jet weaving machine is the preservation of jet-integrity". How are designers trying to solve this problem ? Describe the principles in brief.

10

11. a) Why Sinkers are essential on single jersey weft knitting machines ?

b) Explain loop forming cycle of a single jersey weft knitting machine using needle type of your choice.

c) What would be the production in kg/hour of a single jersey weft knitting machine of 20 inch diameter, 63 feeders and 24 gauge using 24s cotton yarn to produce plain single jersey fabric with 2.5 mm stitch length ? The machine runs at 30 rpm speed with an efficiency of 80%.

3 + 6 + 6

12. a) Why minimum of two needle tracks in both cylinder and dial are essential on an interlock weft knitting machine ?

b) Draw the design of a derivative of an interlock structure and mention the cam positions in the cam boxes in both cylinder and dial along with corresponding needle movement.

- c) Explain how Knit, Tuck and Miss stitches are formed on a weft knitting machine. 3 + 6 + 6
13. a) Show with schematic diagrams the Knitting cycle of a Latch needle for the production of a single jersey fabric. 5
- b) What are the advantages of knitting and reasons for growth of knitting as a method of fabric formation ? 10

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