

Register Number:

B.TECH DEGREE EXAMINATIONS: APRIL/MAY 2014

(Regulation 2009)

Fifth Semester

TEXTILE TECHNOLOGY
TTX109: Shuttleless Weaving

Time: Three Hours

Maximum Marks: 100

Answer all the Questions

PART A (10 x 1 = 10 Marks)

1. Weft accumulators with measuring device are essential for
 - a) automatic looms.
 - b) rapier looms.
 - c) air-jet looms
 - d) gripper projectile looms.
2. Weft insertion can be from both ends of the loom in this type of loom:
 - a) Single shuttle loom
 - b) Projectile loom
 - c) Air-jet loom
 - d) Rapier loom
3. The acceleration of the gripper in a projectile loom is dependent on
 - a) the warp tension.
 - b) the angle of twist set in torsion bar.
 - c) the shed depth.
 - d) design/colour pattern of the sort woven.
4. In a projectile loom, the start of the journey of gripper starts at this moment:
 - a) Initiation of twisting of torsion bar
 - b) Dropping of gripper at the other end of the loom.
 - c) Release of twisting of torsion bar
 - d) Start of winding of yarn on the accumulator
5. Rigid rapier looms require
 - a) less floor space.
 - b) more floor space.
 - c) high size add-on.
 - d) air-conditioned atmosphere.
6. Loom reversing motion is not possible in
 - a) projectile looms.
 - b) rapier looms.
 - c) air-jet looms.
 - d) automatic shuttle looms.
7. The maximum permissible dust particle size in compressed air meant for air-jet weaving is
 - a) 5 microns.
 - b) 10 microns.
 - c) 50 microns.
 - d) 500 microns.
8. The purpose of the zinc coating on the inner surface of the air pipe lines for distributing air for air-jet weaving is this:
 - a) To ensure air pressure does not drop
 - b) To increase air turbulence
 - c) As an anti-rust treatment
 - d) To absorb oils from air

9. Water jet looms are most suitable for weaving
 - a) cotton yarns.
 - b) linen yarns.
 - c) woolen yarns.
 - d) hydrophobic filament yarns.
10. Fused selvages are possible with this type of fabrics made from yarns of
 - a) cotton.
 - b) wool.
 - c) viscose rayon.
 - d) polyester.

PART B (10 x 2 = 20 Marks)

11. Classify shuttleless weaving technologies on the basis of weft insertion techniques.
12. What are the essential yarn quality parameters you would give attention to use as weft in air-jet weaving?
13. Though the speed of projectile looms is significantly high, the warp end breaks are in general low (other things remaining the same). How does this become possible?
14. A projectile loom runs at a speed of 450 picks per minute and the width-in-reed is 320 cm. Calculate the weft insertion rate.
15. What are the advantages and limitations of rigid rapiers?
16. Differentiate between tip transfer and loop transfer.
17. What is the role of auxiliary nozzles in air-jet looms?
18. What is meant by confuser system in air-jet weaving?
19. What are the types of yarns most suitable for water jet weaving technology?
20. List the various types of selvages used in shuttleless looms.

PART C (5 x 14 = 70 Marks)

21. a) (i) Enumerate the major limitations of shuttle looms. (4)
(ii) Take any two types of shuttleless looms. Outline the yarn quality requirements (10) along with proper technological reasoning.
(OR)
b) (i) Analyze the need for weft accumulators in shuttleless looms. (4)
(ii) With illustrative sketches, outline the principles of shedding and beating (10) motions in multiphase weaving.
22. a) Outline the weft insertion cycle in projectile weaving machine with suitable diagrams.
(OR)
b) (i) A loom shed with 96 projectile looms has an average loom speed of 350 picks (4) per minute. The average EPI and PPI of the sorts woven are 98 and 94 respectively. Calculate the expected production in linear metres per day, if the achievable efficiency is 92 %. Assume that the looms run 'round-the-clock'.

- (ii) Give a technical outline of the picking mechanism of projectile weaving machine focusing on the engineering aspects of the components involved. (10)

23. a) Explain the salient features of various types of rapier drives with suitable diagrams.

(OR)

- b) (i) Classify the various types of rapier weaving machines. (4)
(ii) Compare and contrast the Gabler and the Dewas systems of weft transfer in rapier weaving. (10)

24. a) Give a detailed technical account on the quality and the quantity of air, and the air distribution network for air-jet weaving machines.

(OR)

- b) Explain the constructional features of the various machine elements and their operation for inserting weft in air-jet weaving machines.

25. a) (i) Discuss the changes and modifications that have to be incorporated in water jet weaving machines in comparison with other types of looms. (6)

- (ii) Enumerate the various fabric defects and their remedies in air-jet and projectile looms. (8)

(OR)

- b) (i) Explain the weft insertion system in water jet weaving machine. (6)
(ii) You have been entrusted with the responsibility of choosing a suitable shuttleless weaving technology for your enterprise. Write the techno-economic factors that you would take into account to arrive at a judicious decision. (8)
