

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII • EXAMINATION – WINTER 2013

Subject Code: 172903**Date: 05-12-2013****Subject Name: Production Planning and Maintenance****Time: 10:30 TO 01:00****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)** A yarn preparatory unit is having 7 warping machines running at 600 meters/min with 55 % efficiency and having 550 ends/beam with a set length of 30000 meters/beam. Calculate number of winding machines, having following details, to be required to supply wound packages to the said warping machine unit : • Speed – 1500 meters/min • No. of spindles – 120
 • Efficiency % - 90 • Yarn count - 30^s **07**
- (b)** A carding department is working with following parameters: **07**
 Doffer RPM – 40
 Doffer Diameter – 27 inch
 Hank of lap fed – 0.0016
 Draft – 95
 Efficiency – 88%
 Calculate production of carding machine and number of cards required to produce 1600 kgs of carded sliver per shift.
- Q.2 (a)** Calculate the number of automatic shuttle looms running at 220 rpm with 82 % efficiency to be required to produce 5.00 lac meters of following variety of fabric per month : • Reed/Pick – 70/42 • Warp/Weft – 30^s/32^s • Fabric Width – 42 inches also, calculate the weight of warp and weft to be required to produce the said quantity of fabric. **07**
- (b)** Calculate efficiency and allocation of looms for a weaving unit having shuttle looms running at 165 rpm. Consider the frequency of warp breaks, weft breaks, shuttle change and weft change observed for 1.00 lac picks are found to be 21, 14, 72 and 81 respectively. **07**
- OR**
- (b)** State the importance of maintenance in weaving industries. Explain, in detail, the daily, weekly, monthly and quarterly/yearly check points for sizing machines. **07**
- Q.3 (a)** Classify maintenance. Explain the daily, weekly, monthly and quarterly/yearly check points for Plain Power looms in detail. **07**
- (b)** Prepare warp and weft production schedules using following details : **07**
 • No. of looms – 350 projectile looms running at 90 % efficiency
 • Speed – 475 picks/min • Width of grey fabric – 3 meters
 • Warp/weft yarn denier – 600/400 • Reed/pick – 20/12
- OR**
- Q.3 (a)** Calculate the number of air-jet looms running at 1000 rpm with 90 % efficiency to be required to produce following qualities and quantities of fabrics during the year : • 1/1 plain fabric – 7^s / 7^s yarn count, reed/pick – 20/20, 4.0 lac pieces each of 1.20 meters length **07**
 • 1/2 2/1 twill fabric – 30^s / 36^s yarn count, reed/pick – 80/56, 5.0 million metres
 • Fabric Width – 52 inches

- (b) A weaving unit having 180 rapier looms running at 500 rpm with efficiency of 88 % is producing fabric of 58 inches width. The fabric is woven by using 70 denier yarn as warp and weft and reed/pick are 90/72. Calculate the number of texturing machines, having following details, to be required to supply textured yarn to the said weaving unit per day : 07
- Speed – 1200 meters/day
 - No. of spindles/machine – 120
 - Yarn denier – 70
 - Efficiency % - 90
- Q.4 (a)** Prepare a production schedule to produce 600 kgs of carded warp yarn of 36's Ne and 600 kgs of 40's Ne carded weft yarn on a modern spinning line. Calculate input required at Blow room if waste at Blow room is 10% .Assume waste levels at all machines as per standards. 07
- (b)** Prepare spin plan to produce 24s Ne warp and 24's Ne weft on rotor spinning system using following data: 07
- Contraction due to twist in weft is 6.5%
 - Contraction due to twist in warp is 7.5%
 - lap weight – 14 oz/yard
- OR**
- Q.4 (a)** Calculate production of Rotor spinning department from following data : 07
- Rotor RPM – 1,00,000
 - T.M – 5.2
 - Count produced – 18's warp
 - Efficiency – 90%
 - Number of spindles /machine – 216
 - Number of machines – 10
- If it is decided to decrease rotor rpm by 10% and efficiency increase by 2%, calculate the effect on production. Assume any other data required
- (b)** Prepare spin plan for producing Polyester – Cotton blended combed yarn of 84's Ne warp if lap weight of cotton is 11 oz/yard , lap weight of polyester is 9 oz/yard and contraction due to twist is 7%. 07
- Q.5 (a)** Calculate number of Super lap former and Combers required if it is required to produce 1200 kgs of Combed sliver /shift in a mill using following data: 09
- Comber Data:
- Hank of lap fed – 0.01
 - Nips/min – 260
 - Feed/nip - 8 mm
 - Noil% - 8
 - Efficiency – 90%
 - Super lap former – 60mts/min and 80% efficiency
- (b)** Discuss the important aspects of maintenance at Carding. 05
- OR**
- Q.5 (a)** It is required to produce 1000 kgs of 50's semi combed warp yarn in a spinning mill. Calculate number of Ring frames and Speed frame required for the same . 09
- The Ring Frame which has 800 spindles , is operating at spindle rpm of 14,000 at 88% efficiency, with T.M of 3.8 and draft of 25.
- The Speed Frame which has 240 spindles , is operating at spindle rpm of 1400 at 85% efficiency, with T.M of 0.95.
- (b)** Discuss the important aspects of maintenance at Speed frame. 05
