

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII • EXAMINATION – SUMMER • 2014

Subject Code: 172903**Date: 03-06-2014****Subject Name: Production Planning and Maintenance****Time: 02:30 pm - 05:00 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)** Prepare Warp & Weft Production Schedules to produce 6 lac metres of grey fabric per month having following details : **07**
- Reed/Pick – 90/56
 - Warp/Weft – 40s/36s
 - Fabric Width – 48 inches
- (b)** In a spinning mill blow room is working with following parameters : **07**
- Hank of lap delivered - 0.0014
 Delivery speed - 40 mts/min
 Efficiency - 84%
 Number of scutchers - 3
 Length of lap - 200 mts
 Calculate Production of Blowroom in terms of
 (i) Kgs/shift/scutcher
 (ii) Number of laps produced in department /shift
- Q.2 (a)** A weaving unit is set to produce following varieties of fabrics during the year : **07**
- 1/2 twill fabric – 22.00 lac mts, Reed/pick – 60/42
 - 2/4 twill fabric – 1.5 million metres, Reed/pick – 80/52
 - Fabric Width – 42 inches
 - Loom Speed – 140 rpm
 - Efficiency % - 78
- Calculate the number of Shuttle Looms to be required to produce the said quantity of fabric.
- (b)** Calculate number of Warping machines running at 700 mts/min with 55% efficiency and having 500 ends/beam with a set length of 30000 mts/beam to receive the wound packages having 36^s yarn count per day from a Unit having 12 Winding machines each having 60 spindles and running at 1000 mts/min with 88% efficiency. **07**
- OR**
- (b)** State different types of maintenance. Explain the daily, weekly, monthly and quarterly/yearly check points for Winding machines in detail. **07**
- Q.3 (a)** Discuss the role of maintenance in Yarn Preparatory sections of weaving industries. Explain, in detail, the daily, weekly, monthly and quarterly/yearly check points for Warping machines. **07**
- (b)** A Yarn Preparatory Unit has 4 Texturing machines each having 140 spindles and running at 1200 mts/min with 96 % efficiency. Calculate the number of Projectile Weaving machines to be installed to match with the production capacity of the said Yarn Preparatory Unit. These Projectile Weaving machines are running at 450 rpm with 92 % efficiency and producing industrial fabric having Reed/Pick of 40/22, 56 inches width and using 140 denier of yarn as warp & weft. **07**

OR

- Q.3 (a)** Calculate allocation of looms for a weaving unit having plain power looms running at 125 rpm. The frequency of warp breaks, weft breaks, shuttle change and weft change observed for 1,10,000 picks are found to be 22,14,72, and 83 respectively. **07**
- (b)** Calculate number of Sizing machines running at 80 mts/min with 52 % efficiency to be required to supply weaver's beam to a Weaving unit to achieve 86 % efficiency of 250 Rapier weaving machines. Following variety of fabric is woven on the said weaving machines : **07**
- Reed/Pick – 82/60
 - Warp/Weft – 72 Denier /62 Denier
 - Fabric Width – 56 inches
 - Weave – Plain
 - Loom Speed – 380 rpm

- Q.4 (a)** A spinning mill is producing yarn of 60s Ne combed warp and 64s Ne combed weft using 1.5 inch staple on a modern spinning line. Prepare spin plan if the % contraction of warp is 4.5 and weft is 4.0 and lap weight is 11 oz/yard. **07**
- (b)** Prepare production schedule if a rotor spinning department is required to produce 1000 kgs of 16s Ne warp. **07**
Also calculate number of machines required if Rotor RPM is 80,000, T.M is 5.0, efficiency is 92% and each machine is having 160 rotors.

OR

- Q.4 (a)** A comber department is working with following parameters : **07**
Feed/nip - 8 mm
Nips/min - 300
Efficiency - 88%
Noil - 11%
Hank of lap fed - 0.015

Calculate number of combers required if output required from department is 2400 kgs /shift.

- (b)** Prepare production schedule if a spinning mill is required to produce 2000 kgs of combed warp and 1600 kgs of weft yarn of 100s Ne . **07**
- Q.5 (a)** Following data refers to Speed frame department of spinning mill: **07**
Hank of sliver fed - 0.16
Draft - 12
T.M - 0.9
Spindle RPM - 1450
Efficiency - 85%
Number of spindles/machine - 120
Calculate :
(i) Hank of roving delivered
(ii) Delivery speed in mts/min
(iii) Number of machines required to produce 800 kgs of yarn /shift.
- (b)** Discuss in detail important aspects of maintenance of Carding. **07**

OR

- Q.5 (a)** Following data refers to Ring frame department of spinning mill: **07**
- Hank of Roving fed - 1.2
 - Draft - 20
 - T.M - 4.2
 - Spindle RPM - 18000
 - Efficiency - 88%
 - Number of spindles/machine - 1064
- Calculate :
- (i) Count delivered
 - (ii) Production /machine/shift
 - (iii) Number of machines required to produce 1200 kgs of yarn /shift.
- (b)** Discuss in detail important aspects of maintenance of Ring frame. **07**
