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

Subject Code: 172903

Date: 24-05-2013

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) A yarn preparatory unit has 7 warping machines, each of which is 07 running at 700 mts/min speed with 60 % efficiency and having a creel capacity of 500 packages. Calculate number of sizing machines which will receive the warper's beams each of 25000 mts of set length per day from the said unit to attain their efficiency of 55 %. Each sizing machine is required to produce the weaver's beam of 3360 ends using 70 denier of yarn and running at 50 mts/min speed.
 - (b) Prepare a spin plan to produce 36's carded warp and 36's carded weft 07 if the lap weight is 14oz/yard and twist contraction is 7 % for warp and 6.5% for weft.
- Q.2 (a) The frequency of warp breaks, weft breaks, shuttle change and weft 07 change observed for 95,000 picks are found to be 19,11, 69, and 78 respectively. Calculate allocation of looms and efficiency for a weaving unit having plain power looms running at 145 rpm.
 - (b) State the importance of maintenance in weaving industries. Explain, in 07 detail, the daily, weekly, monthly and quarterly/yearly check points for winding machines.

OR

- (b) Calculate production of texturising machines in kgs/shift of 8 hours. 07 The machine is having 120 spindles and running at the speed of 1000 mts/min with 91 % efficiency using 76 denier of yarn. How many such machines are required to supply said textured yarn per day to a weaving unit having 225 water-jet looms running at speed of 800 rpm with efficiency of 93 %? The fabric to be produced is having 60 inches width using 76 denier yarn as warp and weft and having reed/pick of 96/76.
- Q.3 (a) A weaving unit is set to produce following varieties of fabrics during 07 the year :
 - Poplin fabric 30^s/ 36^s yarn count, reed/pick 80/52, 3.5 lac pieces each of 4.25 mts length
 - 2/2 2/1 twill fabric $40^{s}/36^{s}$ yarn count, reed/pick 96/56, 4.25 million metres
 - Fabric Width 42 inches

Calculate the number of shuttleless looms to be required to produce the said quantity of fabric.

(b) A weaving unit having shuttle looms requires 85000 kgs of 30^s warp 07 yarn and 78000 kgs of 30^s weft yarn per month of 30 days. Calculate the number of winding, warping and sizing machines to supply the required quantity of yarn per month. The details of machines used are

as follows :

- Winding M/c : speed 1000 mts/min, spindles 120 , efficiency 65 %
- Warping M/c : speed 600 mts/min, creel capacity 500 , efficiency 55 %
- Sizing M/c : speed 65 mts/min, ends/beam 3000 , efficiency 45 %

OR

- Q.3 (a) A weaving unit having 200 projectile looms running at speed of 550 07 picks/min is producing a 2.5 mts width of grey fabric from 480 denier warp / 240 denier weft nylon yarn at an efficiency of 89 %. The reed/pick of the fabric are 22/14. Prepare warp and weft production schedules for the said quality of fabric.
 - (b) What is maintenance ? Explain, in detail, the daily, weekly, monthly 07 and quarterly/yearly check points for sizing machines.
- Q.4 (a) Prepare a production schedule to produce 24's warp and weft yarn, 07 each 800 kgs /shift on Rotor spinning machine.
 - (b) Following data refers to Speed frame department : 07

Spindle RPM – 1400 T.M – 1.25 Efficiency – 85% Number of spindles/machine – 216 Hank of sliver fed – 0.14 Total Draft – 10

Calculate TPI in roving , Delivery speed in mts/min and production of speed frame in terms of Kgs/shift /machine.

OR

Q.4 (a) A comber department is working with following data : 07 Feed/nip = 8mm Nips/min = 240 Hank of lap fed = 0.012 Efficiency = 90% Noil = 8 %

Calculate production of comber from data and hence calculate number of combers required to have 1000 kgs/shift production.

- (b) Discuss the various aspects related to maintenance of Comber. 07
- Q.5 (a) Prepare a spin plan to produce 20's warp and 24's weft if the lap 07 weight is 15oz/yard and T. M warp is 5.2 and T.M weft is 5.0 on rotor spinning machine.
 - (b) Calculate production of Draw frame department from following data in 07 terms of Kgs/shift/department:

Hank of sliver fed – 0.16 Draft – 6 Doubling – 8 Surface speed of Back roller – 100 mts/min Efficiency – 90% Number of deliveries/machine – 2 Total number of Draw frames – 4

OR

- Q.5 (a) Prepare a production schedule to produce 50's semicombed warp 07 800kgs/shift and 50's semicombed weft 600 kgs./shift.
 - (b) Discuss the important aspects related to maintenance of Blow room. 07
