GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII EXAMINATION – SUMMER 2016

Subject Code:172903   **Date:07/05/2016**

Subject Name:Production Planning & Maintenance

Time:02:30 PM to 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) Calculate the number of Warping machines to be required to supply beams per day to the Sizing unit having 6 sizing machines if the Warping machine speed is 550 mts/min, using 36^s yarn count and efficiency % is 55. Assume set length of 28000 metres and 450 ends/beam. Use following details for sizing machines ;   **07**
   - Ends/beam – 2200
   - Length of warp sheet per beam – 250 mts
   - Speed – 50 mts/min
   - Efficiency % - 50

(b) A comber department is working with following data :   **07**
Feed/nip - 8 mm
Nips /min - 300
Efficiency - 85 %
Hank of Lap fed - 0.016
Noil % - 10
Calculate number of Combers required if 2400 kgs of production is required per shift.

Q.2 (a) Prepare warp and weft production schedules using following details :   **07**
   - No. of looms – 250 rapier looms running at 94 % efficiency
   - Speed – 380 picks/min
   - Width of grey fabric – 1.5 meters
   - Warp/weft yarn denier – 300/200
   - Reed/pick – 24/18

(b) Calculate the number of Sizing machines running at 75 mts/min with 48 % efficiency to be required to supply sized beams to the unit having automatic shuttle looms producing 2.8 lac meters of following variety of fabric per month: **07**
   - Reed/Pick – 80/52
   - Warp/Weft – $30^s/36^s$
   - Fabric Width – 52 inches

OR

(b) State the importance of maintenance in warping department. State different types of maintenance. Explain the daily, weekly, monthly and quarterly/yearly check points for Warping machines in detail.   **07**

Q.3 (a) State the importance of maintenance in weaving industries. Explain, in detail, the daily, weekly, monthly and quarterly/yearly check points for Weaving machines.   **07**

(b) Calculate the weight of warp and weft threads to be required to produce 55000.00 metres of grey fabric per day having following details : **07**

- Reed/Pick – 96/56
- Warp/Weft Counts– $40^s/36^s$
- Fabric Width – 48 inches

Also, calculate the number of Shuttle Looms running at 160 rpm with 75 % efficiency to be required to produce the said quantity of fabric per day.

OR

Q.3 **(a)** Calculate the number of Projectile Weaving machines to be installed to utilize the production of 2 Texturing machines each having 140 spindles and running at 1100 mts/min with 92 % efficiency. These Projectile Weaving machines are running at 420 rpm with 93 % efficiency and producing industrial fabric having Reed/Pick of 43/20, 62 inches width and using 160 denier of yarn as warp & weft. **07**

(b) The frequency of warp breaks, weft breaks, shuttle change and weft change observed for 90,000 picks are found to be 17, 09, 57 and 71 respectively. Calculate allocation of looms for a weaving unit having plain power looms running at 135 rpm with 74 % efficiency. **07**

Q.4 **(a)** Prepare spin plan to produce Carded yarn of 36 Ne Warp and 38s Ne weft on modern spinning line ,if Hank of lap fed is 0.0018 and T.M is 4.0 for warp and 3.8 for weft. **07**

(b) A Speed frame department is working with following parameters : **07**
Spindle RPM - 1800
T.M - 1.0
Hank of roving - 2.0
Efficiency - 85 %
Number of spindles / machine - 120
Calculate delivery speed in mts/min and production in terms of kgs /shift /spindle.
If the speed of machine is decreased by 8 % , efficiency increases by 4 %.
What will be the effect on production ? Is it advisable to do it ?

OR

Q.4 **(a)** Prepare a spin plan to produce rotor spun yarn of 12s Ne Warp and weft is T.M is 5.3 for warp and 5.0 for weft . Hank of lap fed is 0.002 **07**

(b) A rotor spinning has following parameters : **07**
Rotor Rpm - 1,00,000
T.M - 5.0
Count - 16
Efficiency - 92%
Calculate production in terms of kgs/spindle/shift.
Hence calculate number of positions required to produce 2200 kgs of rotor spun yarn per shift

Q.5 **(a)** Prepare production schedule for producing 1500 kgs/shift of combed warp yarn of 80s Ne and 1000 kgs/shift of 84s Ne Combed Weft, on modern spinning line which uses Super lap former.
Assume other data required. **07**

(b) Discuss in detail important aspects of maintenance of Carding machine. **07**

OR

Q.5 **(a)** A ring frame department has following specification : **07**
Spindle RPM - 16000
T.M - 4.0
Count - 50s Ne
Draft - 25
Efficiency - 88%

Calculate production in terms of kgs/spindle /shift.
Also calculate surface speed of back roller and time required for roving bobbin
to exhaust if the weight of roving of package is 1 kgs.

(b) Discuss daily, weekly, monthly and yearly check points for Ring frame. **07**

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