

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

Subject Code: 172903**Date: 02-12-2014****Subject Name: Production Planning and Maintenance****Time: 10:30 am - 01:00 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 number of carding machines required for producing 1200 kgs of carded sliver per shift, from following data : **07**

Hank of lap - 0.14

Draft - 90

Doffer diameter - 27 inch

Doffer RPM - 40

Efficiency - 90%

- (b)** The frequency of warp breaks, weft breaks, shuttle change and weft change observed for 80,000 picks are found to be 16, 08, 52 and 69 respectively. Calculate allocation of looms for a weaving unit having plain power looms running at 120 rpm with 72 % efficiency. **07**

- Q.2 (a)** A weaving unit is set to produce 80,000 meters of grey fabric per day having following details : **07**

- Reed/Pick – 96/56
- Warp/Weft Counts– 30^s/36^s
- Fabric Width – 52 inches

Calculate the weight of warp and weft threads required. Also, calculate the number of shuttle looms required , if looms are running at 135 rpm with 79 % efficiency , to produce the said quantity of fabric per day.

- (b)** Calculate the number of automatic shuttle looms running at 210 rpm with 86 % efficiency , required to produce 3.5 lac meters of following variety of fabric per month : **07**

- Reed/Pick – 60/40
- Warp/Weft – 40^s/36^s
- Fabric Width – 48 inches

Also, calculate the number of Sizing machines required , running at 65 mts/min with 45 % efficiency to supply sized beams to the said unit.

OR

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

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

- (b)** Prepare warp and weft production schedules using following details : **07**

- No. of looms – 460 waterjet looms running at 92 % efficiency
- Speed – 850 picks/min
- Width of grey fabric – 1.9 meters
- Warp/weft yarn denier – 480/240
- Reed/pick – 22/16

OR

Q.3 (a) A Weaving Unit has 180 Plain Power looms running at 120 rpm with 72 % efficiency and producing fabrics of 42 inches of width having 60 picks/inch. Calculate number of Pirn winding machines each of 20 spindles and running at 200 mts/min with 90 % efficiency required to supply pirns having 36^s yarn count per day to meet with the requirements of said unit. **07**

(b) A unit has 8 Sizing machines, producing a sized beam of 2400 ends with a length of warp sheet per beam of 300 mts and running at 55 mts/min with 48 % efficiency. Calculate the number of warping machines required to supply beams per day to the said sizing unit if the warping machine speed is 600 mts/min, using 30^s yarn count and efficiency % is 50. Assume set length of 30000 metres and 550 ends/beam. **07**

Q.4 (a) Prepare spin plan for producing 24's Ne carded warp and 20's Ne carded weft if % contraction is 5.5 and 5.0 respectively on rotor spinning machine. Lap weight is 15 oz/yd. **07**

(b) Prepare production schedule if a spinning mill is required to produce 1200 kgs/shift of semicombed Warp and 800 kgs of weft yarn of 50s Ne . **07**

OR

Q.4 (a) A Ring frame department is working with following parameters : **10**
Hank of sliver fed - 1.4
Draft - 30
T.M - 3.8
Spindle RPM - 16,000
Efficiency - 85%
Number of spindles/machine - 864

Calculate :

(i) Count of yarn delivered

(ii) Production /machine/shift

(iii) Number of machines required to produce 1000 kgs of yarn /shift.

If it is decided to reduce spindle RPM by 10% such that efficiency improves by 5% , then what will be the change in production /machine /shift and number of machines required.

(b) Calculate production of Draw frame department from following data : **04**
Hank of sliver fed - 0.16
Surface speed of front roller - 800 mts /min
Surface speed of back roller - 100 mts /min
Doubling - 8
Efficiency - 60%
Number of Deliveries - 2

- Q.5 (a)** Calculate production of Rotor spinning machine per spindle / shift from **07**
following data :
Hank of Sliver - 0.12
Draft - 182
T.M - 5.5
Efficiency - 92%.
Rotor RPM = 90,000

If due to power failure the machine stops for 2 hours, calculate loss of production in kgs/spindle.

- (b)** Discuss in detail the important aspects of maintenance in Blow room. **07**

OR

- Q.5 (a)** Calculate number of comber machines required for producing 1800 kgs of **07**
combed sliver per shift, if a comber department is working with following
parameters :

Feed/nip - 9 mm
Nips/min - 280
Efficiency - 90%
Noil - 12%
Hank of lap fed - 0.016

- (b)** Discuss in detail the important aspects of maintenance in Comber. **07**
