

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (OLD) EXAMINATION – WINTER 2023****Subject Code:2172903****Date:14-12-2023****Subject Name: Production Planning & Maintenance****Time: 10:30 AM TO 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.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- Q.1*** (a) Calculate production of carding department from following data **03**
 Doffer rpm – 50
 Doffer diameter – 30 inch
 Hank of sliver delivered – 0.16
 Efficiency – 88%
 No of cards -14
- (b) If a blow room having 2 scutcher, is working with following parameters, Calculate **04**
 the number of laps produced per shift:
 Lap roller diameter – 10 inch
 Lap roller rpm – 12
 Efficiency - 85%
 Length of each lap – 50 mts
- (c) Prepare warp & weft production schedules to produce 6 lac metres of grey fabric **07**
 per month having following details :
 • Reed/Pick – 90/56
 • Warp/Weft – 40s/36s
 • Fabric Width – 48 inches
- Q.2** (a) Calculate the speed of Air Jet looms if the weft insertion rate is 1600 mts/min and **03**
 width of loom is 76".
- (b) A weaving unit is set to produce following varieties of fabrics during the year: **04**
 • 2/2 twill fabric – 18.00 lac mts, Reed/pick – 66/46
 • Fabric Width – 42 inches
 • Loom Speed – 140 rpm
 • Efficiency % - 78
- Calculate the number of shuttle looms required to produce the said quantity of fabric.
- (c) Calculate number of winding machines each having 60 spindles and running at **07**
 1200 mts/min with 85% efficiency to be required to supply wound packages
 having 40s yarn count per day to meet with the requirements of a unit having 5
 warping machines running at 550 mts/min with 60% efficiency and having 450
 ends/beam with a set length of 25000 mts/beam.
- OR**
- (c) A weaving unit has got 300 waterjet weaving machines running at 900 rpm to **07**
 produce shirting fabric having reed/pick of 74/70 and 48 inches of width.
 Calculate the number of texturing machines each having 120 spindles and running
 at 1500 mts/min with 94 % efficiency required to supply 70 denier warp & 70

denier weft textured yarn per day, to the said unit to achieve 92% efficiency of weaving machines.

- Q.3 (a)** 86,000 meters of following quality of grey fabric are to be produced: **03**
- Reed/Pick – 72/42
 - Warp/Weft – 44^s/36^s
 - Fabric Width – 52 inches
 - Contraction % - 5

Calculate weight of Warp & Weft yarns in kgs.

- (b)** Discuss daily, weekly and monthly maintenance of plain power loom. **04**

- (c)** A weaving unit is set to produce following varieties of fabrics during the year: **07**
- Denim fabric with 20 picks/inch – 2.5 lac pieces each of 3.5 mts length
 - 4/2 twill fabric with 80 picks/inch – 1.2 million metres
 - Fabric Width – 48 inches

Calculate the number of Shuttle Looms running at 145 rpm with 77 % efficiency to be required to produce the said quantity of fabric.

OR

- Q.3 (a)** A roving package of 1.6 hank is weighing 2 kgs. Calculate number of ring bobbins of 48s Ne that can be produced from it, each of 4000 mts length, ignoring the twist contraction. **03**

- (b)** Discuss important points to be considered for maintenance of rapier looms. **04**

- (c)** Prepare spin plan to produce polyester cotton blended yarn(67:33) 60s Ne combed warp. TM used is 4.0. (Assume Hank of lap) **07**

- Q.4 (a)** A comber is working at 300 rpm and removing 10% noil. Calculate its production if feed/nip is 8 mm, efficiency is 90%, Number of heads are 8 and hank of lap fed is 0.014 **03**

- (b)** Discuss important points related to maintenance sizing machine. **04**

- (c)** Prepare production schedule to produce 1200kgs/shift of combed warp and 1000 kgs/shift of combed weft of 80s Ne . **07**

OR

- Q.4 (a)** A rotor spinning machine is producing count of 16Ne warp. If rotor rpm is 90000, efficiency is 92%, Calculate production per spindle per shift if T.M is 5.5. **03**

- (b)** Discuss maintenance winding machine. **04**

- (c)** Prepare production schedule to produce 2000kgs/shift of rotor spun warp of 18s Ne and 1500 kgs/shift of rotor spun weft of 20s Ne . **07**

- Q.5 (a)** A super lap former machine is working at delivery speed of 70 mts /min. If the hank of lap delivered is 0.016 and efficiency is 80%, calculate production of the machine in kgs/shift. **03**

- (b)** Discuss various aspects of maintenance of Blow room. **04**

- (c)** A ring frame department is working with following parameters: **07**
- Spindle Rpm – 14000
Yarn Count – 36
T.M – 4.2
Efficiency- 92%
Number of spindles /machine – 1024

Calculate :

1) Production in kgs/machine

2) Number of machines required for 1200kgs of production/shift.

3) Time to fill one doff, if length of yarn on each bobbin is 4000 mts.

OR

- Q.5 (a)** Calculate production of Draw frame if delivery speed is 800 mts/min , efficiency is 90% , hank of sliver delivered is 0.14 and number of deliveries is 2. **03**

- (b)** Discuss important aspects of maintenance of Comber. **04**

(c) A Speed frame department is working with following parameters:

Spindle Rpm – 1200

Hank of roving – 1.4

T.M – 1.0

Efficiency- 86 %

Calculate :

1) Production in kgs per spindle /shift

2) Number of spindles required for producing 1000kgs of roving per shift.

3) Number of doffs/shift if each roving package is of 2 kgs.
