Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2020

Subject Code:2172903 **Date:21/01/2021**

Subject Name:Production Planning & Maintenance

Time:10:30 AM TO 12:30 PM **Total Marks: 56**

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Write the equation for calculation of total number of ends and total number of picks in the fabric.	**03**
	(b)	Calculate number of Warping machines running at 550 mts/min with 51% efficiency and having 450 ends/beam with a set length of 25000 mts/beam to receive the wound packages weighing 15000 kgs and having 30^s yarn count per day from a Unit having Winding machines.	**04**
	(c)	Prepare production schedule to produce 1200 kgs/shift of 60s Ne semi combed warp and 800 kgs/shift of 60s Ne semi combed weft on modern spinning line. Hence calculate number of bales required at Blow blow room if each bale is of 200 kgs and trash removed at Blow room is 6%.	**07**
Q.2	**(a)**	Calculate production of Carding machine per shift from following data: • Hank of lap fed - 0.0014 • Draft - 90 • Efficiency - 85% • Doffer rpm - 40 Doffer diameter - 27 inch	**03**
	(b)	Calculate the weight of warp and weft threads to be required to produce 1.50 lac metres of grey fabric per day having following details : • Reed/Pick – 96/56 • Warp/Weft – $30^s/36^s$ • Fabric Width – 52 inches	**04**
	(c)	Calculate the number of Texturing machines each having 160 spindles and running at 1200 mts/min with 95 % efficiency to be required to supply 76 Denier warp & 76 Denier weft textured yarn per day to the Weaving unit having following details : • 240 Waterjet Weaving machines • running at 750 rpm to produce shirting fabric • Reed/Pick : 66/56 • 52 inches of width • 94 % efficiency	**07**
Q.3	**(a)**	State importance of maintenance in winding department.	**03**
	(b)	Explain, in detail, the daily, weekly and monthly check points for warping machines.	**04**
	(c)	Calculate the number of sizing machines having following details to be required to supply sized beams per day to a weaving unit having 224 plain power looms, weaving 60 picks/inch quality of fabric and running at 145	**07**

rpm with 69% efficiency.

Sizing machine details :

- speed -160 feet/min,
- using 36^s yarn count
- efficiency % - 48
- 600 metres of warp sheet length per sized beam
- 3000 ends/beam

Q.4 **(a)** Calculate time after which the weft package is to be replaced using following details : **03**

- Speed rpm / Efficiency % -510/95
- R. S. (cm) – 140
- Weft Denier – 66
- PPI – 76
- Weight of Yarn on package – 1.2 kgs

(b) A mill wants to produce 6000 m of a particular fabric every day. Calculate no. of bobbins required from pirn winding department using following details : **04**

- R.S.-48”
- PPI–56
- Count–36^s Ne
- Length contraction – 5%
- Weight of yarn on pirn – 1.4 ozs
- Pirn winding speed/Eff. – 450 ypm / 72%

(c) Calculate allocation of looms for a weaving unit having plain power looms running at 140 rpm if the frequency of warp breaks, weft breaks, shuttle change and weft change observed for 92,000 picks are found to be 19,9,63, and 81 respectively. **07**

Q.5 **(a)** Calculate the rpm of Air jet loom if the weft insertion rate is 2000 metres/min and the fabric width is 56 inches. Assume efficiency of 97 %. **03**

(b) Explain, in detail, the daily, weekly and monthly check points for sizing machines. **04**

(c) A Yarn Preparatory Unit is having 6 Warping machines running at 550 mts/min with 55 % efficiency and having 520 ends/beam with a set length of 24000 mts/beam. Calculate number of Winding machines each having 120 spindles and running at 1100 mts/min with 89% efficiency to be required to supply wound packages having 30^s yarn count per day to meet with the requirements of the said Yarn Preparatory Unit. **07**

Q.6 **(a)** Calculate length of roving available on roving bobbin from following data : **03**

- Hank of roving- 1.2
- T.M - 1.0
- Spindle RPM - 1400
- Efficiency - 90%
- Time to fill one doff - 5 Hrs

(b) Discuss in detail maintenance of carding machine. **04**

(c) Prepare production schedule to produce 1000 kgs of combed yarn/shift of 80s Ne. Assume noil 12 % . **07**

Hence calculate number of comber required from following data:

- Feed/nip - 8 mm
- Nips / min - 350
- Efficiency - 88%
- Hank of lap fed - 0.016

Q.7 **(a)** Calculate number of laps produced in blow room/shift, if lap roller rpm is 10, diameter is 10 inch, efficiency is 84% , length of lap is 40 mts , number of scutcher are 2. **03**

(b) Calculate production of Draw frame department having 2 Draw frames with twin deliveries, if hank of sliver delivered is 0.14, delivery speed is 800 mts/min, efficiency is 92%. **04**

(c) Prepare spin plan to produce rotor spun yarn of 14s Ne warp & 16s Ne weft, if hank of lap used is 0.0012 and twist contraction is 5.5 % for warp and 5.2% for weft. **07**

Q.8 **(a)** Calculate number of cans filled/shift at single delivery draw frame if can accommodates 5000 mts of drawn sliver. The draw frame is running at 600 mts/min and 90% efficiency. **03**

(b) Following data refers to rotor spinning machine : **04**

- Rotor Rpm – 1,00,000
- T.M – 5.5
- Count – 24s Ne
- Efficiency – 90%

Calculate :

1) Production/rotor spindle /shift
2) Time to fill package of 1 kg

(c) A ring frame department is working with following parameters: **07**

- Hank of roving fed - 1.4
- Draft - 26
- T.M - 4.0
- Spindle rpm - 16000
- Efficiency - 90%
- Number of spindles /machine - 864

Calculate

- production /spindle/shift .
- number of spindles required for producing 1000kgs of yarn/day

****