

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER- VII EXAMINATION-SUMMER 2023****Subject Code: 3172915****Date: 19/06/2023****Subject Name: Production Planning in Textile****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 Draw frame department if : <ul style="list-style-type: none"> • Delivery speed - 800 mts/min • Efficiency - 90% • Number of deliveries 2 • Number of draw frame - 3 • Hank of sliver delivered - 0.15 	03
	(b)	Calculate production blow room having 2 scutcher and working with following parameters, <ul style="list-style-type: none"> • Lap roller diameter – 10 inch • Lap roller rpm – 10 • Efficiency - 88% • Hank of Lap - 0.0012 If each card is producing 600 kg/shift , Calculate number of cards that can be fed by this Blow room.	04
	(c)	Prepare Warp & Weft Production Schedules to produce 6 lac metres of grey fabric per month having following details : <ul style="list-style-type: none"> • Reed/Pick – 90/56 • Warp/Weft – 40s/36s Fabric Width – 48 inches	07
Q.2	(a)	Calculate the number of Air Jet looms running at 900 rpm with 93 % efficiency to be required to produce 11.50 lac meters of following variety of fabric per month : <ul style="list-style-type: none"> • Reed/Pick – 80/52 • Warp/Weft – 30S/36S • Fabric Width – 56 inches 	03
	(b)	Discuss the cost/kg calculation for yarn.	04
	(c)	Calculate the weight of warp and weft threads to be required to produce 1.00 lac metres of grey fabric per day having following details : <ul style="list-style-type: none"> • Reed/Pick – 80/52 • Warp/Weft – 40s/36s • Fabric Width – 48 inches Also, calculate the number of Shuttle Looms running at 160 rpm with 77% efficiency to be required to produce the said quantity of fabric per day.	07
OR			
	(c)	Calculate the production of Sizing machine in kgs/shift of 8 hours if the machine speed is 180 feet/min, using 30s yarn count and efficiency	07

% is 45. Assume 800 metres of warp sheet length per sized beam and 3200 ends/beam. Also, calculate the number of such machines to be required to supply sized beams per day to a weaving unit having 200 plain power looms, weaving 52 picks/inch quality of fabric and running at 175 rpm with 68% efficiency.

- Q.3** (a) A water jet loom shed works with the following particulars. Calculate time after which weft bobbin is to be replaced : **03**
 No. of looms -98
 Speed rpm/Efficiency % - 520/97
 Reed Space (cm) -135
 Weft Denier – 55
 PPI – 96
 Wt. of yarn on bobbin (kg) – 1.3
- (b) Discuss the cost/metre calculation for fabric. **04**
- (c) Calculate allocation of looms for a weaving unit having plain power looms running at 160 rpm. The frequency of warp breaks, weft breaks, shuttle change and weft change observed for 1,10,000 picks are found to be 22,14,78, and 86 respectively. **07**
- OR**
- Q.3** (a) A knitting machine is running at a speed of 20 rpm with 30 feeders. Calculate the total number of courses produced in 1 hour. **03**
- (b) Explain some of the important maintenance check points for loom shed. **04**
- (c) Calculate number of 2- for- 1 Twisting machines having 9000 spindle rpm to be required to supply warp & weft yarn per day to a Weaving unit to achieve 88 % efficiency of 200 Rapier weaving machines. Following variety of fabric is woven on the said weaving machines : **07**
- Reed/Pick – 72/68
 - Warp/Weft – 62 Denier 1800 TPM /62 Denier 1600TPM
 - Fabric Width – 51 inches
 - Weave – Plain
 - Loom Speed – 500 rpm
 -
- Q.4** (a) Find the approximate circumference of fabric and Wales per inch in a fabric having 24 gauge, 20 inch diameter. (Assume fabric shrinkage = 35 %) **03**
- (b) Discuss the important points for maintenance of Blow room. **04**
- (c) Prepare spin plan to produce combed warp of 60's Ne and combed weft of 64's Ne using Super lap former. Hank of lap fed is 0.0016, TM warp is 4.1 and T.M weft is 3.8. **07**
- OR**
- Q.4** (a) If weight of roving package is 2 kg, calculate length of roving in meters if hank is 1.2. **03**
 How many meters of yarn can be produced from this package if draft on ring frame is 20.(Ignore twist contraction)
- (b) Discuss the important points for maintenance of Speed frame. **04**
- (c) Prepare production schedule to produce 1200 kgs/shift of combed warp and 1000 kgs/shift of combed weft of 70s Ne ,considering 10% noil. **07**
 Calculate number of bales, each of 200 kgs required at blow room if waste generated at Blow room is 6%.

- Q.5** (a) A rotor spinning machine is producing count of 16 Ne warp. If rotor rpm is 100000, efficiency is 90%, Calculate number of spindle required to produce 1000 kgs of yarn/shift. Assume T.M is 5.5. **03**
- (b) Explain the term depreciation . **04**
Hence discuss various causes of depreciation.
- (c) A ring frame is working with following parameters: **07**
- Spindle RPM - 14500
 - T.M - 4.0
 - Yarn Count - 36
 - Efficiency - 88%
 - Weight of yarn per bobbin - 80 gms
 - Number of Spindles/machine - 864

Calculate:

- 1) Production of Ring frame in terms of kgs/shift
- 2) Time to fill one doff
- 3) Number of doffs/shift

OR

- Q.5** (a) A super lap former is working at delivery speed of 40 mts/min. and 90% efficiency. If each lap is of 300 mts length, calculate time to produce 1 lap and number of laps produced per shift. **03**
- (b) Explain straight line method for calculating depreciation with suitable example. **04**
- (c) A comber department is working with following parameters ; **07**
- Feed /nip - 9 mm
 - Nips /min - 450
 - Efficiency - 85%
 - Number of Heads - 8
 - Noil - 12%
 - Hank of lap fed - 0.016
 - Number of Combers - 10

Calculate production of comber department in terms of Kgs/shift.

If it is decided to reduce speed by 30 rpm and increase efficiency by 3%, calculate the effect on production.