

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 7 – EXAMINATION – SUMMER 2026

Subject Code: 3172915

Date: 08/06/2026

Subject Name: Production Planning in Textile

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.**
- 4. Simple and non-programmable scientific calculators are allowed.**

- Q.1**
- (a)** Convert 50 Ne yarn count to Tex. **03**
 - (b)** A loom runs at 450 Picks Per Minute (PPM) with 85% efficiency, weaving a fabric with 60 Picks Per Inch (PPI). Calculate the fabric production in meters per hour. **04**
 - (c)** Prepare a Production Schedule for 1200 kg/shift of rotor yarn of 10 Ne. Consider suitable data for a modern machine combination. **07**

- Q.2**
- (a)** Enlist weekly and monthly maintenance checkpoints for a Rapier Loom. **03**
 - (b)** A Carding machine with 0.15 sliver hank and 90% efficiency produces 6 kg/hr. calculate the required Doffer Surface Speed (m/min). **04**
 - (c)** A combing department is working with the following parameters: Feed/nip: 7 mm, Nips/min: 450, Hank of lap fed: 0.013 Ne. If the number of combers are 4, the average efficiency is 90% and noil removed is 15%, calculate production in terms of kgs/shift/m/c and of the department. **07**

OR

- Q.2**
- (c)** A textile mill produces a suiting's fabric with the following specifications: Warp/Weft: 40/30s Ne, EPI/PPI: 80/60, R.S.: 150 cm, Length wise contraction: 7%. Find out the GLM of the fabric. Also, work out the requirement of warp and weft yarn per 1000 m of fabric. **07**

- Q.3**
- (a)** The input sliver to the Finisher Draw Frame is 0.14 Ne and the output sliver is 0.13 Ne. If the number of doublings is 8, calculate the actual Draft applied. **03**
 - (b)** A Ring Frame is running at 20,000 RPM, 90% efficiency, producing 40 Ne yarn with a twist multiplier of 4.0. Calculate the production in grams per spindle per hr. **04**
 - (c)** Prepare a Spin Plan for 2000 kg/shift of combed yarn of 30 Ne. Consider suitable data for a modern machine combination. **07**

OR

- Q.3**
- (a)** Sliver Hank is 0.15. Lap Former Draft is 1.2 and Doubling is 20. Calculate the final Lap Hank. **03**
 - (b)** A Two-for-One (TFO) twister is running at 12,000 RPM and produces a Twist Per Meter (TPM) of 700. Calculate the delivery speed in meters per minute. **04**
 - (c)** Prepare a Spin Plan for 10000 kg/shift of OE yarn of 12 Ne. Consider suitable data for a modern machine combination. **07**

- Q.4**
- (a)** A 100 meter finished fabric required 105 meters of warp yarn. Calculate the percentage of warp crimp. **03**

- (b) Calculate the No. of beams produced on a sectional warping machine in a shift from the following data: Warping Speed 600 mpm, beaming speed 400 mpm, Efficiency 85%, No. of Ends/Beam 4200, Length of Warp Sheet/Beam 15000 meters. **04**
- (c) A warping beam of 15,000 meters is to be prepared. If the machine speed is 400 m/min and efficiency is 65%, calculate the time (in minutes) required. **07**

OR

- Q.4** (a) A fabric with 72 Ends Per Inch (EPI) is woven on a loom with a total reed space of 150 cm. Calculate the required Reed Count in dents/cm. **03**
- (b) A Warping machine runs at 1000 m/min with 88% efficiency for 8 hours. Calculate the total warp length (in km) produced. **04**
- (c) A plain woven fabric has the following details: Warp/Weft: 20s/16s Ne, EPI/PPI: 72/60, Finished Width: 60 inches, Warp Contraction/Crimp: 6%, Weft Crimp: 4%. Calculate the weight of warp yarn & Weft yarn (in grams) required for 1 square meter of fabric. Calculate the GSM & GLM of the fabric. **07**

- Q.5** (a) A yarn sample of 1000 yards weighs 0.05 lbs. Calculate the yarn count in Ne. **03**
- (b) what are the different component of Total cost. explain with suitable example. **04**
- (c) A textile mill wants to produce a denim fabric of the following particulars: Warp/Weft: 10/12 Ne, EPI/PPI: 60/40, R.S.: 170 cm, Length wise contraction: 4%. Calculate the GSM and GLM of the fabric. **07**

OR

- Q.5** (a) Discuss the maintenance schedule of a Carding machine. **03**
- (b) A loom runs at 6500 RPM with 55 PPI. Calculate the theoretical fabric production in meters per hour. **04**
- (c) What is the technical significance of maintenance of machinery in textile industry. Discuss the different types of maintenance. **07**
