

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (OLD) EXAMINATION – WINTER 2018****Subject Code: 172903****Date: 19/11/2018****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.

- Q.1 (a)** In a weaving unit 40 projectile looms are running with following quality of fabrics. **09**

Fabric Details:

R.S.: 56"

Reed count: 80s

Length contraction: 5%

Warp/Weft: 2/80sNe / 50s Ne

Ends/dent: 2

GSM: 160

Loom RPM: 320

Loom Effi.(%) : 89

Loom width: 130"

Calculate how many warp beams will be required per week for the above shed if maximum length of yarn on a beam is 3000 m (ignore selvage during calculation)

- (b)** Calculate the time after which all cans will be exhausted on draw frame from following data. **05**

Doublings: 8

DF Speed: 450 mpm

DF Efficiency: 85%

Count of sliver: 4.1 ktex

Wt. of sliver in one can: 27.8 lbs

Draft: 8

- Q.2 (a)** A fabric is to be produced having 40 inch Reed Space. The fabric has a weft way stripe of 50 threads per repeat comprising of 10 dark threads and 40 white threads. Find out requirement of dark and white weft yarn per 100 linear m of fabric. The PPI are 60. Count of the weft yarn is 2/80s Ne. **07**

- (b)** Calculate how many times warping creel needs to be changed from following data. **07**

Maximum length on warper's beam : 20000 yds

Length of yarn on weaver's beam : 2000 yds

No. of ends in weaver's beam : 5328

No. of weaver's beams required : 20

Count of yarn : 50s Ne

No. of threads in warping creel : 592

Wt. of yarn on package : 1.75 kg

OR

- (b)** A mill wants to produce 8000 m of a particular fabric every day. Calculate number of bobbins required from winding and pirn winding departments from following details. **07**

R.S. : 45"

EPI : 80

Weight of fabric: 175 gsm

Count : 40s / 34s Ne

Length of yarn on wound bobbin : 70000 m

Winding speed/eff. : 1100 mpm / 85%

Pirn winding speed/eff. : 500 ypm / 75%

Length contraction : 6%

Weight of yarn on pirn : 1.2 ozs

Q.3 (a) Find out efficiency of following looms from pick counter readings taken for 2 hours. 07

Loom no.	Pick Counter Reading		RPM	PPI
	Start	End		
1	10312	31696	98	90
2	09834	32514	210	80
3	18979	42739	220	52

(b) Write all maintenance check points for winding and ordinary plain power loom. 07

OR

Q.3 (a) Weaving department has following types of looms and the fabric varieties to be produced on particular loom. Calculate total requirement of yarn. (Assume 6 % contraction for each fabric) 10

Loom details:

Type of loom	Max. R.S.	RPM	Eff. %	No. of looms
1. Air jet	190 cm	650	90	24
2. Rapier	220 cm	500	90	24
3. Autoloom	56"	200	90	48

Fabric Details & Requirement:

No.	EPI / PPI	R.S"	Wp / Wt.	Req.(m)	To be woven on
1	80 / 52	42	34 / 34	35000	Autoloom
2	120 / 96	56	2/80 / 50	30000	Air jet
3	80 / 80	50	2/60 / 2/60	28000	Rapier

(b) Derive equation to work out length of yarn per weft bobbin, length of cloth produced per weft bobbin and no. of weft bobbins per loom per hour. What is the effect of change in PPI on number of weft bobbins required per hour? 04

Q.4 (a) Write atleast five maintenance check points for carding machine 04

(b) An OE Spinning Plant has following requirement for a month (30 working days at 24 hrs per day) 10

Count	Requirement	TM	Rotor speed rpm	eff. %
9s	22,000 kgs	4.6	75000	95

Calculate no. of OE spindles required to produce above counts. Also calculate no. of cards required from following data.

Doffer dia: 27" Doffer rpm: 35 Tension draft: 1.01
Count of sliver: 4.91 ktex Efficiency of Card : 85%

OR

Q.4 (a) A texturising plant has following requirement per day: 07

Count(Denier)	Required Production in kg
75/36	1200
75/36/400	0800

Calculate no. of spindles required of SDS 600(94%efficiency) and of TFO (running at 13000 rpm and 91 % efficiency).

(b) There is a requirement of 300 kgs/day of 40s 100% cotton and 600 kgs/day of 54s PC blended (67:33) material. How many comber shifts required to cater requirement of material. Nips/min is 250 and feed/nip is 5 mm. Other data is as given below: 07

Comber type	Count	lap wt.g/m	noil %	eff. %
Bicoiler 8 head	54s pc	68	15	90

- Q.5 (a)** Ring frame department of a spinning unit supplies following yarns (from same mixing) to a weaving unit per day: **10**

Count	Fibres	TM	Production in kg
32s K	100 %	4.1	500
40s C	Cotton	4.0	600

Work out number of blow room laps required per hour from following data.

Lap roller speed: 5 mpm efficiency : 85%
 Count of lap : 490 g/m lap length : 40 yds
 (assume waste% at all stages)

- (b)** Calculate the production of a ring frame from following data: **04**

Count : 42sNe TM : 4.2
 Spindles: 1008 Spindle speed/eff.% : 21000/85%

OR

- Q.5 (a)** Calculate weight of doff, time after which doff is to be taken and time after which roving bobbin will be exhausted on ring frame from following data. **07**

Speed of RF: 15000 rpm Eff.: 87% Count of yarn: 42sNe
 TM: 4.0 Wt. of roving bobbin: 3.5 lbs
 Waste at RF: 2.5 % Count of roving: 0.59 ktex
 No. of spindles: 880 Length of yarn on ring bobbin: 4200 m

- (b)** Calculate time after which the lap will be exhausted on card from following data. **07**

Lap weight: 490 ktex Lap length: 40 yd Doffer dia.: 27"
 Doffer rpm: 30 Efficiency: 86 % Tension draft: 1.01
 Draft at card: 100

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