

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– III (New) EXAMINATION – WINTER 2019****Subject Code: 2132905****Date: 7/12/2019****Subject Name: Basic Engineering 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.

MARKS

- Q.1** (a) Differentiate between method study and work measurement. **03**
 (b) Explain predictive maintenance in detail. **04**
 (c) State and explain Cochran boiler. **07**

- Q.2** (a) Differentiate between breakdown maintenance and preventive maintenance. **03**
 (b) What is flow process chart? Discuss the utility for method study engineer. **04**
 (c) By graphical method solve the following LPP **07**

$$\begin{aligned} \text{Maximize } & Z = 2x_1 + 3x_2 \\ \text{Subject to, } & x_1 + x_2 \leq 30 \\ & x_1 \geq 3 \\ & x_2 \leq 12 \\ & x_1 - x_2 \geq 0 \\ & 0 \leq x_1 \leq 20. \end{aligned}$$

OR

- (c) Find the basic feasible solution of the following transportation problem by north-west corner rule. **07**

	1	2	3	4	5	Availability
A	4	3	1	2	6	80
B	5	2	3	4	5	60
C	3	5	6	3	2	40
D	2	4	4	5	3	20
Requirement	60	60	30	40	10	

- Q.3** (a) What are three time estimates used in context of PERT? **03**
 (b) Explain humidification by steam injection with neat sketch. **04**
 (c) Using simplex method solve the LPP **07**

$$\begin{aligned} \text{Maximize } & Z = 15X_1 + 6X_2 + 9X_3 + 2X_4 \\ \text{Subject to, } & 2X_1 + X_2 + 5X_3 + 6X_4 \leq 20 \\ & 3X_1 + X_2 + 3X_3 + 25X_4 \leq 24 \\ & 7X_1 + X_4 \leq 70 \\ & X_1 \geq 0, X_2 \geq 0, X_3 \geq 0, X_4 \geq 0 \end{aligned}$$

OR

- Q.3** (a) Explain humidification and dehumidification. **03**

- (b) What is critical path? State necessary and sufficient condition of critical path. **04**
- (c) Solve the following assignment problem **07**

	P	Q	R	S	T
1	11	17	8	16	20
2	9	7	12	6	15
3	13	16	15	12	16
4	21	24	17	28	26
5	14	10	12	11	13

How should the job can be assigned so that total cost is minimized

- Q.4** (a) Explain the work sampling with example. **03**
- (b) Explain the Least cost method briefly with example. **04**
- (c) Differentiate fire tube and water tube boilers. **07**

OR

- Q.4** (a) What do you understand by scale and sludge formation in boilers? **03**
- (b) List down the various techniques of work measurement. **04**
- (c) A small maintenance project consist of the following jobs, whose precedence relationships are given below **07**

Job	1-2	1-3	2-3	2-5	3-4	3-6	4-5	4-6	5-6	6-7
Duration (days)	15	15	3	5	8	12	1	14	3	14

Find the critical path and total project duration.

- Q.5** (a) Define the boiler. List essential parts of boiler. **03**
- (b) State the rules of constructing project network in CPM and PERT method. **04**
- (c) Describe the algorithm for the solution of assignment problem. **07**

OR

- Q.5** (a) What are the internal and external feed water treatments of water? **03**
- (b) What is man and machine chart? How it is to make a method analysis? **04**
- (c) A project is represented by the network .The activity times are given below. Determine expected time, variance and critical path **07**

Activity	1-2	1-3	1-4	2-5	2-6	3-5	4-7	5-7	6-7
Optimistic Time	5	18	26	15	16	6	7	3	7
Most Likely Time	8	20	33	20	18	9	10	4	8
Pessimistic Time	10	22	40	25	20	12	12	5	9
