Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III EXAMINATION – SUMMER 2016

Subject Code:132905 **Date:04/06/2016**

Subject Name:Basic Engineering 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.**

Q.1 **(a)** Explain predictive maintenance in detail **07**

(b) What is coal fired boiler? Explain the working of any one fire tube boiler with neat sketch. **07**

Q.2 **(a)** Differentiate between method study and work measurement **07**

(b) A company makes two kinds of leather belts. Belt A is a higher quality belt, and B is of lower quality. The respective profits are Rs. 4.and Rs. 3 per belt. Each belt of type A requires twice as much time as a belt of type B. if all belts were of type B, the company could make 1000 belts per day. The supply of leather is sufficient for only 800 belts per day (Both A and B).Belt A requires a fancy buckle and only 400 buckles per day available. There are only 700 buckles a day available for belt B. Determine the optimal product mix. Formulate the Linear programming problem and solve by graphical method. **07**

OR

(b) A small project is composed of seven activities whose time estimates are listed in table as follow: **07**

Activity		Estimated duration(weeks)		
i	j	Optimistic	Most likely	Pessimistic
1	2	1	1	7
1	3	1	4	7
1	4	2	2	8
2	5	1	1	1
3	5	2	5	14
4	6	2	5	8
5	6	3	6	15

a) Draw the project network
b) Find expected duration and variance of each activity.
c) What is expected project length?

Q.3 **(a)** Discuss the merits and demerits of water tube boiler and fire tube boiler. **07**

(b) Use Vogel's Approximation method to obtain an initial basic feasible solution of transportation problem: **07**

	D	E	F	G	Available
A	11	13	17	14	250
B	16	18	14	10	300
C	21	24	13	10	400
Demand	200	225	275	250	

OR

Q.3 **(a)** Define time study. Name the time study equipments and explain briefly the utility of each of them **07**

(b) Use the simplex method to solve the following LP problem **07**

Maximize $Z = 3X_1+2X_2$
Subject to, $2X_1+X_2 \leq 40$
$2X_1+3X_2 \leq 60$
$X_1+X_2 \leq 24$
$X_1 \geq 0, X_2 \geq 0$

Q.4 **(a)** How the time estimates are made in PERT model? What is critical path **07**

(b) In a modification of a plant layout of a factory, four new machines M_1, M_2 M_3, and M_4 are to be installed in a machine shop. There are five vacant places A, B, C, D, and E available. Because of limited space, Machine M_2 cannot be placed at C and M_3 cannot be placed be placed at A. the cost of machine i at place j(in hundred rupees) is shown below: **07**

Machine	Location				
	A	B	C	D	E
M_1	9	11	15	10	11
M_2	12	9	--	10	9
M_3	--	11	14	11	7
M_4	14	8	12	7	8

Find the optimal assignment schedule.

OR

Q.4 **(a)** What is man and machine chart? How is it used to make a method analysis? **07**

(b) Explain humidification by steam injection with neat sketch. **07**

Q.5 **(a)** What is a relaxation allowance? Why it is given? How it is measured? **07**

(b) A project consists of a series of tasks labeled A, B, …, H, I with the following relationships(W< X, Y means X and Y can not start until W is completed; X,Y<W means W can not start until both X and Y are completed). With this notations, construct network diagram having the following constraints: **07**

A< D, E; B, D < F; C < G; B, G < H; F, G < I.

Find also minimum time of completion of the project, when the time (in days) of completion of each task is as follows:

Task	A	B	C	D	E	F	G	H	I
Time	23	8	20	16	24	18	19	4	10

OR

Q.5 **(a)** Explain different types of floats and their implications. What is dummy activity? **07**

(b) Explain necessity of water treatment of boiler feed water. Describe any one feed water treatment in detail. **07**

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