

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III • EXAMINATION – WINTER • 2014****Subject Code: 2132905****Date: 18-12-2014****Subject Name: Basic Engineering in Textile****Time: 02.30 pm - 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.

- Q.1** (a) 1. Differentiate between internally fired boiler and externally fired boiler **07**
 2. Differentiate between natural circulation and forced circulation in boiler.
- (b) 1. What is humidification and dehumidification **07**
 2. What are the methods for obtaining humidification and dehumidification
- Q.2** (a) Explain any one work measurement technique in detail **07**
 (b) A company has 4 machines to do 3 jobs. Each job can be assigned to only one machine. **07**
 The cost of each machine is given below. Determine the job assignments that will minimize the total cost.

Machine					
Job		W	X	Y	Z
	A	18	24	28	32
	B	8	13	17	18
	C	10	15	19	22

OR

- (b) Use the simplex method to solve the following LP problem **07**
 Maximize $Z = 3X_1 + 5X_2 + 4X_3$
 Subject to, $2X_1 + 3X_2 \leq 8$
 $2X_2 + 5X_3 \leq 10$
 $3X_1 + 2X_2 + 4X_3 \leq 15$
- Q.3** (a) Determine initial basic feasible solution for the following transportation problem using North west corner method and check its optimality. **07**

Destinations					
Factory		D ₁	D ₂	D ₃	Capacity
	F ₁	2	2	3	10
	F ₂	4	1	2	15
	F ₃	1	3	1	40
	Demand	20	15	30	65

- (b) Describe the procedure of Method study **07**
- OR**
- Q.3** (a) What are the rules to be followed to construct network in CPM and PERT **07**

- (b) A paper Mill produces two grades of paper namely X and Y. owing to raw material restrictions, it cannot produce more than 400 tons of grade X and 300 tons of grade Y in a week. There are 160 production hours in a week. It requires 0.2 and 0.4 hours to produce a ton of products X and Y, respectively with corresponding profits of Rs.200 and Rs. 500 per ton. Formulate the above as an LPP to maximize profit and find the optimum product mix. **07**

- Q.4** (a) Activities of a small project are given below. Draw the network of this project. What is the probability of completing the project within 26 days **07**

Activity	1-2	2-3	2-4	3-5	4-5	5-6	5-7	6-8	7-8
Most optimistic time(days)	1	1	8	3	1	3	4	4	2
Most likely time(days)	1	4	12	5	1	6	6	8	5
Most pessimistic time(days)	1	7	10	7	1	9	8	12	8

- (b) Explain Necessity of feed water treatment. **07**

OR

- Q.4** (a) Explain cooling with adiabatic dehumidification **07**

- (b) Describe maintenance philosophy which can reduce maintenance cost. **07**

- Q.5** (a) A small project consists of the following jobs, whose precedence relations are identified with their node numbers as follows. **07**

Job	1-2	1-3	1-4	2-3	2-5	2-6	3-7	4-5	5-6	6-7	6-8	7-8
Duration (Days)	10	4	6	5	12	9	12	15	6	5	4	7

1) Draw network diagram

2) Find critical path and project duration

- (b) With a neat simple sketch of Cochran boiler, Explain how it is superior to simple vertical boiler. State its limitations also. **07**

OR

- Q.5** (a) Explain significance and construction of any one recording technique in detail **07**

- (b) How various allowances are used to build standard time in work measurement? **07**
