

GUJARAT TECHNOLOGICAL UNIVERSITY**B.E. Sem-III Remedial Examination May 2011****Subject code: 132905****Subject Name: Basic Engineering in Textile****Date: 20-05-2011****Time: 10.30 am – 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) Discuss the utility of outline process chart in method study. **07**
Differentiate between outline process chart and flow process chart.

- (b)** 1. Briefly discuss “SIMO Chart” **02**
2. What is standard time? Describe briefly how you will calculate “standard time” from the observed time obtained by time study? **05**

Q.2 (a) A small project is composed of 7 activities whose time estimates (in weeks) are listed in the table below. **07**

Activity	Optimistic time	Most Likely time	Pessimistic time
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

- (i) Draw the network diagram of the activities in the project.
- (ii) Find the expected duration and variance for each activity.
- (iii) Find the critical path and also find the expected project length.

(b) The activity durations for a project are given below. Draw the network and identify the critical path. Durations of the activity are in days. **07**

Activity	Duration	Activity	Duration
10-20	7	30-60	10
10-30	10	40-60	7
20-30	4	50-70	10
20-40	5	60-70	8
30-40	6	60-80	12
30-50	11	70-80	10

OR

- (b)** 1. Explain the terms optimistic time, pessimistic time, most likely time and expected time in PERT network. **04**
2. Define critical path. Give its significance in the network. **03**

- Q.3 (a)** Discuss the merits and demerits of water tube boiler and fire tube boiler. **07**
- (b)** List the various coal fired boiler and explain Cochran boiler in detail with neat sketch. **07**

OR

- Q.3 (a)** Explain the distribution of steam, water and compressed air in textile industries. **07**
- (b)** What is indirect method of humidification? Explain with neat diagram. **07**

- Q.4 (a)** Differentiate between breakdown maintenance and preventive maintenance. **07**
- (b)** Explain the necessity of feed water treatment. **07**

OR

- Q.4 (a)** Draw the flow chart for simplex algorithm. **07**

- Q.4 (b)** Solve following LPP using simplex. **07**

$$\begin{aligned} \text{Maximize } Z &= 13x_1 + 11x_2 \\ \text{Subject to, } 4x_1 + 5x_2 &\leq 1500 \\ 5x_1 + 3x_2 &\leq 1575 \\ x_1 + 2x_2 &\leq 420 \\ x_1, x_2 &\geq 0 \end{aligned}$$

- Q.5 (a)** Consider the problem of assigning four operators (**O1–O4**) to four machines (M1 to M4). The assignment costs are given in Rupees. Operator 1 cannot be assigned to machine 3. Also operator 3 cannot be assigned to machine 4. Find the optimal assignment. **07**

	M1	M2	M3	M4
O1	5	5	–	2
O2	7	4	2	3
O3	9	3	5	–
O4	7	2	6	7

If 5th Machine is made available and the respective costs to the four operators are Rs. 2, 1, 2 and 8. Find whether it is Economical to replace any of the four existing machines. If so, which?

- (b)** Explain pH value of water and its importance **07**

OR

- Q.5 (a)** Solve the following minimization Transportation problem using Vogel's approximation method. **07**

	D ₁	D ₂	D ₃	supply
1	20	15	25	40
2	15	10	20	55

Demand 30 25 50

- (b)** Define: psychrometry, degree of saturation, absolute humidity, DBT, schedule maintenance, humidity ratio. **07**
