Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-I Remedial Examination April 2010

Subject code: 711401 **Subject Name: Construction Management**

Date: 06 / 04 / 2010 **Time: 12.00 noon - 02.30 pm**

Total Marks: 60

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Explain the salient features of a construction project. **06**

(b) Explain the term: Time-cost trade-off with it's relevance to construction projects. **06**

State whether following statements are TRUE or FALSE:

[1] The optimum duration of a project is the minimum time in which it can be completed.

[2] Duration of an activity can't be reduced indefinitely.

[3] Any reduction in project duration means increase in indirect cost of the project.

[4] PERT uses probabilistic approach.

Q.2 **(a)** Differentiate between CPM and PERT network. What is work breakdown structure? **06**

(b) The following table gives details of a maintenance project. Which is its critical path? Determine total float, free float and Independent float for each activity. **06**

ACTIVITY	DURATION (Days)
1-2 (A)	3
1-3 (B)	4
1-4 (C)	14
2-6 (E)	5
3-6 (F)	6
3-5 (G)	4
3-4 (D)	2
4-5 (H)	1
5-6 (I)	1

OR

(b) Discuss factors affecting Scheduling of construction projects. **06**

Q.3 **(a)** Why 'Work Study' is valuable? Explain its approach. **06**

(b) For given network, assume that after 14 days of the project following condition prevails: **06**

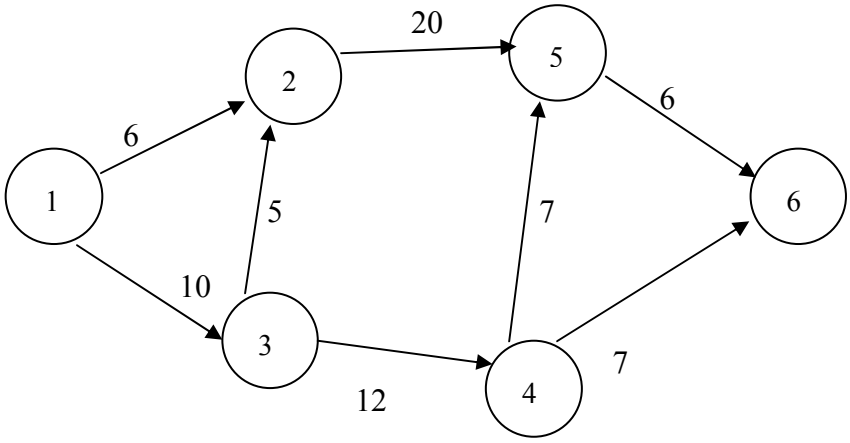
[1] Activity 1-2 & 1-3 are finished as per plan.

[2] Activity 3-4 is still going on and will need 16 more days for its completion.

[3] Activity 4-5 faces some problem and new estimated time is 10 days.

[4] Activity 4-6 can be early completed in 5 days instead of planned 7 days.

[5] All other activities are as per original schedule.



Update the network and compare the critical paths for the old network and the updated network and calculate remaining duration of the project.

Q.3 **(a)** Given below is the detail of a small project mentioning the mason requirement. Level out the mason allocation so that maximum number of masons on any day has to be limited to 7. **06**

Activity	Duration (Days)	Mason req't (No)
1-2 (A)	2	4
1-3 (B)	6	3
1-4 (C)	4	4
2-3	-	-
3-5 (D)	4	3
4-5	-	-
2-6 (G)	5	4
4-6 (E)	5	4
5-6 (F)	5	3

(b) Discuss: Use of computers in various fields of construction industry. **06**

Q.4 **(a)** **06**

Activity	Normal Time	Shortest Time	Cost of reduction per day (Rs.)
1-2	6	4	80
1-3	8	4	90
1-4	5	3	30
2-4	3	3	--
2-5	5	3	40
3-6	12	8	200
4-6	8	5	50
5-6	6	6	--

Above table shows activities for a building contract and its shortest possible times and cost per day for reducing the time of each activity. It includes a penalty clause of Rs. 100 per day over 17 days. The overhead cost per day is Rs. 160.

The cost of completing all activities in normal time is Rs. 6500.

[1] Calculate normal duration of the project, its cost and critical path.

[2] Perform network crashing and find:

Lowest cost and its associated time

Shortest time and its associated cost.

(b) Write short note on: L-O-B technique of scheduling. **06**

OR

Q.4 **(a)** Discuss the project control benefits at different hierarchical levels on construction project organizational structure. **06**

(b) Write short note on: Project Management Information Report. **06**

Q.5 **(a)** A firm has 50 workers and one unit of machines M_1, M_2 and M_3 available for carrying out a project. The activities comprising the project, their durations and resource requirements are as follows: **06**

Activity	Node	Duration (Days)	No. of workers	Machines
A	1-2	5	30	M_1
B	1-3	2	20	M_2
C	1-4	5	30	M_1, M_3
D	2-6	6	20	M_2
E	2-5	8	20	M_1
F	3-5	3	20	M_3
G	4-7	4	40	M_2, M_3
H	5-6	2	20	M_2
I	6-7	3	20	M_2

Allocate the resources to the various activities and determine the duration of the project.

(b) Define: Cost variance, schedule variance, cost performance index and schedule performance index. **06**

What is the difference between CPM and PNA?

OR

Q.5 **(a)** Explain following terms: **06**

Construction management, Resource smoothening, GERT, Decision tree, Time and motion studies, crashing of a network.

(b) Write short note on: Role of construction managers in improving productivity of a construction project. **06**

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