

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013****Subject code: 711401N****Date: 23-12-2013****Subject Name: Construction Management****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) Explain salient distinguishing features of construction project management which makes it unique compared to other project types. **07**
- (b) Write short note on: Project Management Information Report (PMIR). **07**
- Q.2** (a) A construction company has been awarded a contract to construct a factory in a city. The major activities in the project and the relationships among them, the normal and crash durations, and the corresponding normal and crash costs are given in the following table: **07**

Activity	Immediate predecessor(s)	Duration (Days)		Cost (in Rs.)	
		Normal	Crash	Normal	Crash
A	--	4	3	60	90
B	--	6	4	150	250
C	--	2	1	38	60
D	A	5	3	150	250
E	C	2	2	100	100
F	A	7	5	115	175
G	D,B,E	4	2	100	240

Indirect costs vary as follows:

Days	15	14	13	12	11	10	9	8	7	6
Cost (Rs.)	600	500	400	250	175	100	75	50	35	25

- (i) Draw an arrow diagram for the project and find normal project duration and its associated cost.
- (ii) Determine the project duration which will result in minimum total project cost.
- (b)** For the data given in following table, find (a) the critical path and earliest time to complete the project and (b) early and late start, early and late finish, total float, free float and independent float. **07**

Activity	Duration (weeks)	Predecessor (s)	Successor (s)
A	3	--	B,C
B	4	A	D,E,F
C	6	A	G
D	4	B	H
E	5	B	I
F	5	B	J
G	5	C	J
H	3	D	--
I	8	E	--
J	9	F,G	--

OR

- (b) State whether following statements are TRUE or FALSE: 07
1. PERT is used when estimates for task durations can be worked out using past data.
 2. Line-of-Balance (LOB) is used to balance work at different workstations in a mass-production assembly line.
 3. There can be only one critical path in a project network.
 4. A-O-N network cannot represent online finish-start type of relationships between activities.
 5. During resource leveling exercise, the critical activities are given priority for resource allocation.
 6. If SPI is greater than 1, the project is behind schedule.
 7. It is possible to reduce an activity's duration below its crash time by allocating more resources and funds to it.

- Q.3** (a) Discuss the benefits of 'Planning of construction projects'. 07
 (b) (1) Differentiate between: Resource smoothening and Resource leveling. 07
 (2) Define the following: Buffer in L-O-B Technique, Work study, BCWS, ACWP.

OR

- Q.3** (a) What do you understand by Updating of projects? Why is it necessary? Explain the flow chart of updating. 07
 (b) The table below gives a list of activities, the time duration and the required resources for carrying out each of the activities and their availability. Draw the network and critical path. Carry out the Resource Allocation and find the project duration time under the given resource constraints. 07

Activity		1-2	1-3	1-4	2-6	3-5	4-5	4-8	5-7	6-7	7-8
Duration (days)		3	2	6	4	2	1	4	3	2	4
Resources requirement	R ₁	2	4	3	-	2	3	3	2	1	5
	R ₂	3	1	1	4	3	-	-	3	2	4

Maximum number of R₁ available is 7 and R₂ is 5 only.

- Q.4** (a) Differentiate between: CPM networks and PNA networks. 07
 (b) Write short note on: Monitoring performance of construction projects. 07

OR

- Q.4** (a) For a given set of activities, draw A-O-N network and determine the following: 07
 (1) Critical path (2) Total float for each activity (3) Earliest and latest activity time.

Activity	Duration (days)	Activity	Duration (days)
1-2 (A)	5	4-5 (G)	4
1-4 (B)	3	2-5 (H)	4
1-3 (C)	8	6-7 (I)	7
3-7 (E)	7	6-8 (J)	2
4-6 (F)	6	7-8 (K)	6
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- (b) Write short note on: Role of construction managers in achieving success of construction projects. 07

- Q.5** (a) Give the list of project management functions and its related software needs in various areas of construction. 07
 (b) Prepare work break-down structure for the construction project of Crane manufacturing factory. 07

OR

- Q.5** (a) Write short note on: GERT and Decision tree. 07
 (b) Discuss the factors affecting Co-ordination between various agencies in construction projects. 07
