

ME sem I / CIVIL / CBCU / AH2019

28/05/2019

Time: 3 Hours

Marks: 80

- Note: 1. Attempt any 4 Questions 2. All questions carry equal (20) marks
3. Figures to the right indicate marks 4. Attempt sub questions in order
5. Assume any data, if required, and state them clearly

1. a) The following is the planned crew and quantity for the excavation activity. The scheduled work days is 6 days. The planned quantity is 3000 Cubic meters. Determine the planned total cost and unit cost for this activity.

Labor Force Required	Total no.	Rate per day (Rs.)
Back Hoes	07	1000
Operators	07	550
Dump Trucks	10	600
Dump Truck Drivers	10	350

After 3 days, the following is the report generated from the site. Amount of work done: 1200 cubic meters. The crew worked for 8 hours/day for all the 3 days. Determine the cost that was spent for these 3 days. Comment on the productivity of the crew. Calculate the cost required to complete the work in the remaining 3 days. Analyze the given situation and determine whether additional crew is a better option compared to over-time for the existing crew. [10]

b) Explain matrix organization. [5]

c) Explain Line of Balance techniques with an example. [5]

2. a) Devise a training program for training personnel for execution of a nuclear power plant. The technical staff are incompetent in communication skills, understanding drawings, software utilization, etc. [10]

b) Explain the importance of incentives in enhancing workers performance in construction industry. Explain with examples [10]

3. Write short notes on: [20]

a) Project clearance procedures for bullet train

b) Resource leveling

c) Application of PRIMAVERA in construction management

d) Project Management Consultant

4. a) The cost-duration data for various activities of a small building project in an urban area are given in the following table: [14]

Activity code	Normal		Crash	
	Duration (weeks)	Cost (Rs.)	Duration (weeks)	Cost (Rs.)
1-2	6	30,000	3	45,000
1-4	3	20,000	4	52,000
2-3	9	30,000	7	35,000
2-4	8	25,000	5	40,000
3-5	15	35,000	3	40,000
3-6	7	50,000	5	60,000
4-5	2	20,000	1	30,000
4-7	6	60,000	5	62,000
5-6	2	80,000	2	80,000
5-7	4	45,000	4	45,000
6-8	8	75,000	7	77,500
7-8	9	90,000	6	1,14,000

The indirect costs are Rs 15,000/- per week

- i. Draw the network, find the normal project duration and the critical path. Also find the corresponding total project cost.
 - ii. Carry out stage by stage compression and find
 - iii. The optimal duration and the corresponding minimum cost.
 - iv. All crash solution.
 - v. Plot a graph of cost versus time
- b) Develop a detailed safety protocol in accordance with Handbook on Construction safety practices for a Residential Apartment Complex [6]
5. a) Explain in details - Project Life Cycle and its aspects related with construction [8]
 b) Highlight the significant contributions by Abraham Maslow, Henry Fayol and Federick Taylor to the theories of management [12]
6. a) The following data is for a construction of a commercial complex which your company is about to build. The activities, durations and the interdependencies were finalized in the planning meeting. Analyze and determine the earliest duration to execute the project. Also, determine if there are additional days, other than the planned durations for the non-critical activities. [12]

Activity	Duration (Weeks)	Interdependency
Site Clearance	4	-
Surveying	2	Site Clearance
Excavation	4	Site Clearance, Surveying,
Foundation	5	Excavation
Superstructure	15	Foundation
Plastering	4	Superstructure
Painting	6	Superstructure, Plastering
Flooring	4	Plastering, Flooring
Clean up	2	Plastering, Painting, Flooring.

b) The following data refers to time motion study of a dumper loader operation for earth moving activity: [8]

Obs No	Time reqd for adjustment (sec.)	Time reqd to excavate and fill bucket (sec.)	Time reqd for swing (sec.)	Time reqd for lifting, positioning (sec.)	Time reqd to fill the dumper (sec.)
1	25	81	21	26	222
2	15.5	36	20.5	24.5	116.5
3	22.5	41	18.5	28.5	135
4	22	32.5	16	26	104.5
5	38	30	15.5	24.5	162

Based on statistical analysis (measures of dispersion), determine which sub-activity is most efficiently performed and which is least consistently performed. Comment on what may be the possible reasons for the poor performance of the sub-activity
