



**B.E/B.TECH DEGREE EXAMINATIONS: APRIL/MAY 2024**

(Regulation 2018)

Sixth Semester

**CIVIL ENGINEERING**

U18CEI6202: Construction Project Management

**COURSE OUTCOMES**

- CO1:** Estimate the project duration and identify the critical path of the project.  
**CO2:** Smoothen and level the resource demand during project execution.  
**CO3:** Perform resource allocation and time cost optimization.  
**CO4:** Manage equipment and machinery requirements.  
**CO5:** Understand the quality control and safety during construction.

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions: -**

**PART A (10 x 2 = 20 Marks)**

**(Answer not more than 40 words)**

- |   |     |                   |
|---|-----|-------------------|
| 1. Represent the significance of project management.  | CO1 | [K <sub>2</sub> ] |
| 2. Identify the elements of cost estimation in a construction project.  | CO1 | [K <sub>1</sub> ] |
| 3. Assess the impact of scheduling delays on project costs and completion time.                                       | CO2 | [K <sub>2</sub> ] |
| 4. Indicate the advantages and disadvantages of bar chart planning and CPM network construction.                      | CO2 | [K <sub>2</sub> ] |
| 5. Define direct and indirect costs in the context of construction projects.  | CO3 | [K <sub>2</sub> ] |
| 6. Utilize sort rules to prioritize activities and allocate resources accordingly.                                    | CO3 | [K <sub>2</sub> ] |
| 7. Give examples for earthwork excavation equipment.  | CO4 | [K <sub>2</sub> ] |
| 8. How to select suitable equipment for construction work?  | CO4 | [K <sub>1</sub> ] |
| 9. Write a short note on main causes of accidents.  | CO5 | [K <sub>2</sub> ] |
| 10. Mention the difference between statistical quality control with sampling by attributes and sampling by variables. | CO5 | [K <sub>2</sub> ] |

**Answer any FIVE Questions:-**

**PART B (5 x 16 = 80 Marks)**

**(Answer not more than 400 words)**

- |  |    |     |                   |
|--|----|-----|-------------------|
| 11. Evaluate the effectiveness of project management functions in ensuring project success in the construction industry. Discuss challenges and potential solutions for improving project management practices in construction projects. | 16 | CO1 | [K <sub>3</sub> ] |
|--|----|-----|-------------------|

12. A construction company is tasked with building a new office building. The project consists of several activities that need to be completed in a specific sequence. The company has identified the following activities along with their durations and dependencies. 16 CO2 [K<sub>3</sub>]

Activity	Preceding activity	Estimated duration
A	--	5
B	A	10
C	B	15
D	C	8
E	C	12
F	B	7
G	B	6
H	D, E, F, G	10
I	C	5
J	H	9
K	I	6
L	J	7
M	K	8
N	L, M	10

1. Draw the project network diagram showing the sequence of activities and their dependencies.
  2. Calculate the earliest start time (ES), earliest finish time (EF), latest start time (LS), and latest finish time (LF) for each activity.
  3. Determine the total project duration and identify the critical path.
  4. Calculate the float or slack time for each non-critical activity.
13. Consider a project with 7 activities as shown in the table below. The predecessors of each activity and the duration of the activities are given. The number of compressors (consider it as a resource) required by each activity is also listed. Carry out resource allocation and smoothing for the job. 16 CO3 [K<sub>3</sub>]

Activity	Predecessors	Duration (days)	No. of compressors needed
A	-	3	6
B	A	2	1
C	B	5	5
D	B	4	2
E	C	9	4
F	C, D	2	4
G	E, F	1	6

14. A logistics company in India needs to optimize the transportation of goods from three manufacturing plants (M1, M2, M3) to four distribution centers (D1, D2, D3, D4) to minimize transportation costs. The transportation costs per unit of goods from each manufacturing plant to each distribution center are given in the table below: 16 CO4 [K<sub>3</sub>]

	D1 (Delhi)	D2 (Mumbai)	D3 (Chennai)	D4 (Kolkata)	Capacities
<b>M1</b>	500	600	700	550	160
<b>M2</b>	650	550	500	600	120
<b>M3</b>	600	700	550	500	100
<b>Demand</b>	80	100	110	90	

1. Determine the initial feasible solution using the Northwest Corner Rule.
2. Apply the transportation method to improve the initial solution and find the optimal transportation cost.

15. Design a robust safety management system for a construction project, incorporating industry standards and risk mitigation strategies. Evaluate the 16 CO5 [K<sub>4</sub>]

effectiveness of your system in preventing accidents and ensuring compliance with safety regulations. Discuss key safety challenges in construction and how your system addresses them to promote a safe working environment and project success.

16. Explain how the characteristics of the construction industry influence project management practices, considering aspects such as project complexity, stakeholder involvement, and regulatory requirements. Discuss how project managers can navigate these challenges to ensure project success, providing real-world examples to illustrate your points. 16 CO1 [K4]

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