KUMARAGURU
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Register Number:……….…

M.E DEGREE EXAMINATIONS: APRIL/MAY 2024

(Regulation 2018)

First Semester

CONSTRUCTION MANAGEMENT

P18CMT1001: Project Management in Construction

COURSE OUTCOMES

CO1: Understand the project phases and various stakeholders of construction projects.

CO2: Design construction as an integrated project system.

CO3: Estimate the costs induced in construction.

CO4: Monitor the progress of the construction project

CO5: Understand the importance of management information systems.

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Considering the various stakeholders in a construction project, which stakeholder is typically most concerned with ensuring that the project aligns with regulatory compliance and safety standards, thus bearing significant responsibility for risk management.   CO1 [K_1]

   a)   Contractor   b)   Project Manager

   c)   Architect   d)   Owner

2. Sequence the following leadership and motivation factors in the order of their importance for the project team: CO1 [K_2]

   a. Recognition

   b. Clear Communication

   c. Challenging Assignments

   d. Financial Incentives

   a)   c, b, a, d   b)   b, c, a, d

   c)   d, a, c, b   d)   a, b, c, d

3. When structuring the project cost, why is it crucial to allocate joint costs accurately among the various components of a project, particularly in complex construction projects involving multiple phases and stakeholders?   CO2 [K_1]

a) To simplify the budgeting process

b) To ensure transparency and accountability in cost management

c) To expedite the approval of financial reports

d) To avoid conflicts among contractors

4. Match the cost type with its corresponding characteristic: CO3 [K₂]

List I	List II
A. Operating Costs	i. Allocation of joint costs
B. Contractors' Estimate	ii. Costs incurred during project execution
C. Clients' Estimate	iii. Client's prediction of project cost
D. Cost Indices	iv. Contractor's assessment of project cost

a) A-i, B-iii, C-ii, D-iv

b) A-ii, B-iii, C-iv, D-i

c) A-iii, B-i, C-iii, D-i

d) A-iv, B-ii, C-i, D-iii

5. Arrange the following cost estimation methods in the order of their application in project cost estimation: CO2 [K₂]

a. Estimate Based on Engineer's List of Quantities

b. Historical Cost Data

c. Cost Indices

d. Cost Estimation Software

a) b, a, c, d

b) a, d, c, b

c) c, b, a, d

d) d, c, a, b

6. **Assertion:** Cost indices are essential tools in project cost estimation as they help adjust historical cost data to reflect current price levels CO3 [K₂]

Reason: Cost indices are derived from detailed analysis of labor and material costs over time, allowing for accurate estimation of project expenses

a) Both Assertion and Reason are true, and Reason is the correct explanation of Assertion.

b) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.

c) Both Assertion and Reason are false.

d) Assertion is true, but Reason is false

7. Which of the following statements are true regarding project progress control? CO4 [K₂]

   1. The Critical Path Method (CPM) helps identify the longest sequence of tasks in a project.

   2. Earned Value Management (EVM) is used to calculate the project's financial performance only.

3. Gantt charts are useful for visualizing the project schedule.

4. The Schedule Performance Index (SPI) compares planned and actual progress.

Identify the correct combination of true statements.

a)   1, 3, and 4 only   b)   1, 2, and 4 only

c)   2 and 3 only   d)   1, 2, 3, and 4

8. **Assertion:** The Schedule Performance Index (SPI) is a crucial metric for determining the efficiency of time utilization in a project.   CO4   [K$_2$]

Reason: An SPI value of less than 1 indicates that the project is ahead of schedule, suggesting efficient time management.

a)   Both Assertion and Reason are true, and Reason is the correct explanation of Assertion.

b)   Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.

c)   Both Assertion and Reason are false.

d)   Assertion is true, but Reason is false

9. Which of the following statements accurately describe the benefits of using a centralized database management system (DBMS) in project information management?   CO5   [K$_2$]

1. It improves data consistency and integrity.
2. It allows for easier data recovery in case of a system failure.
3. It significantly reduces the need for data entry and updating.
4. It ensures real-time data access for all project stakeholders.

Identify the correct combination of true statements.

a)   1 and 4 only   b)   1, 2, and 4 only

c)   2 and 3 only   d)   1, 2, 3, and 4

10. Which type of database management system supports data distribution across multiple locations but appears as a single database to the user?   CO5   [K$_1$]

a)   Centralized Database   b)   Cloud Database

c)   Distributed Database   d)   Relational Database

PART B (10 x 2 = 20 Marks)

11. How does the role of a project manager evolve through the different stages of a construction project lifecycle, and what key competencies are required at each stage?   CO1   [K$_2$]

12. Assess the effectiveness of turnkey operations in ensuring timely project delivery.   CO1   [K$_2$]

13. How do industrialized construction methods impact project timelines and quality, and what are the primary challenges associated with their adoption in large-scale projects   CO2   [K$_2$]

14.	Name the benefits of prefabrication in terms of cost-effectiveness and project quality.		CO2	[K_1]
15.	Define "historical cost data" in the context of project cost estimation and provide a brief example of how it can be used in a construction project.		CO3	[K_2]
16.	Outline the steps involved in using cost indices for adjusting project estimates, emphasizing how they account for inflation and market trends		CO3	[K_2]
17.	Define Project Closure and briefly explain its components.		CO4	[K_2]
18.	What is the significance of Financial Closure in project management?		CO4	[K_1]
19.	List the types of project information crucial for decision-making, emphasizing their relevance to project managers and team members		CO5	[K_2]
20.	Define centralized database management systems with example.		CO5	[K_2]

PART C (6 x 5 = 30 Marks)

21.	Compare and contrast the characteristics of residential and commercial construction projects, including their typical scope, budget, and timeline.	05	CO1	[K_3]
22.	Evaluate the impact of various factors (e.g., budget constraints, regulatory requirements, market conditions) on the perspectives and decision-making processes of owners and builders in a construction project.	05	CO1	[K_3]
23.	Analyze the key factors that influence functional design decisions, such as user requirements, technical constraints, and regulatory standards, and discuss their relative importance in a specific product or system development scenario	05	CO2	[K_4]
24.	Evaluate the impact of technological advancements in cost estimation software on the accuracy and reliability of project cost estimates, citing real-world examples	05	CO3	[K_5]
25.	Analyze the factors that can impact the final profit or loss outcome of a construction project and recommend strategies to maximize profitability or minimize losses.	05	CO4	[K_3]
26.	Evaluate the advantages and disadvantages of centralized database management systems compared to decentralized systems in construction project information management	05	CO5	[K_4]

Answer any FOUR Questions
PART D (4 x 10 = 40 Marks)

27. Analyze the need for project management in the construction industry, considering factors such as project complexity, stakeholder involvement, and resource constraints.   10   CO1   [K4]

28. Explain the integrated design and construction approach, analyze its benefits and challenges, evaluate methodologies like BIM and IPD, develop an implementation plan for a hypothetical project, and assess the potential impact on project outcomes.   10   CO2   [K4]

29. Explain lifecycle costs of constructed facilities, analyze influencing factors, evaluate strategies for minimizing costs, develop a lifecycle cost analysis for a specific facility type, and discuss importance of accurate estimation from client's perspective.   10   CO3   [K3]

30. A Project schedule has the following characteristics as shown in the table,   10   CO4   [K3]

Activity	Name	Time	Activity	Name	Time
1-2	A	4	5-6	G	4
1-3	B	2	5-7	H	3
2-4	C	2	6-8	I	2
3-4	D	1	7-8	J	4
3-5	E	5	8-10	K	6
4-9	F	4	9-10	L	5

(i) Construct a network diagram
(ii) Determine the total duration of the project
(iii) Identify the critical path
(iv) Tabulate all the project times
(v) Calculate all types of float

31. Explain the relationship between the types of construction projects and the types of project information required. How does the nature of the project influence the information needed, and how can this information be managed effectively?   10   CO5   [K5]

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