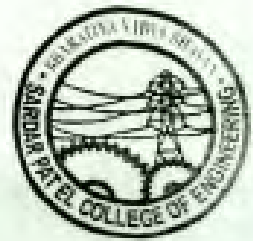




Bharatiya Vidya Bhavan's
Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai - 400058



END SEM/RE-EXAM EXAMINATION -MAY / JUNE 2026

Program: M. Tech. Construction Management

Duration: 3 hr

Course code: PC-MTCM-201 *First Year*

Maximum Points: 100

Name of the Course: Project Monitoring and Control

Semester: II

Instructions:

1. **Question no. 1 is compulsory**
2. Attempt any 4 questions out of remaining 6 question.
3. Neat diagrams must be drawn wherever necessary.
4. Figures to the right side indicate full points.
5. Assume Suitable data if necessary and state it clearly

Sem -II

19/5/26

Q. No.	Questions	Points	CO	BL	Module
1 a	It is proposed to execute a rigid pavement road construction project in Andheri (West). Identify the monitoring and control challenges likely to arise, and recommend remedial measures.	10	CO2	BL3	1,2,3,4
1 b	A drainage line project in suburban Mumbai faces delays due to monsoon flooding. Planned progress = 50%, Achieved progress = 35%. Suggest a risk mitigation plan using PDCA cycle.	6	CO3	BL4	6
1 c	List the different types of waste in the construction of rigid pavement road in Mumbai along with examples.	4	CO4	BL2	3
2 a	A high-rise project in BKC is scheduled to achieve 40% completion by month 6. Actual progress shows only 30% completed. BCWS = ₹80 lakh, ACWP = ₹95 lakh. Calculate Schedule Variance (SV) and Cost Variance. Interpret the project's health.	7	CO3	BL3	4
2 b	Discuss the quality control and safety plan for rigid pavement construction.	8	CO2	BL3	6
2 c	You have visited Mumbai- Ahmedabad high speed Rail package. Discuss the safety guidelines for visitors.	5	CO1	BL2	7
3 a	During a site inspection, you notice that the Excavation work is not being done according to the specified standard procedure. What steps would you take to address this issue as part of project control?	8	CO3	BL3	2,3,4
3 b	Prepare a checklist for Concreting work and pile foundation work in the construction project.	8	CO2	BL2	6
3 c	Highlight the importance of method statement during construction work of a mega project.	4	CO1	BL2	1
4a	A highway project reaches 40% completion but faces material price escalation due to present geopolitical crisis. Apply project updating techniques and draw a flowchart showing how revised schedules and budgets are integrated.	10	CO2	BL3	1,2

4b	Discuss the causes of time and cost overrun in case of construction of a bridge across perennial river and suggest suitable remedial measures	10	CO2	BL2	3,4																																																																								
5a	A contractor is executing a 40-storey commercial tower project using the Critical Path Method (CPM).	10	CO3	BL4	2																																																																								
Update the project. Also show updated critical path and revised duration. At the end of week 24: activities A, B, C, and D were 100% completed. <table><thead><tr><th>Activity</th><th>Original Duration</th><th>Actual Status</th><th>Remaining Duration</th></tr></thead><tbody><tr><td>E</td><td>8</td><td>50% completed</td><td>5</td></tr><tr><td>G</td><td>7</td><td>Slow due to labour shortage</td><td>6</td></tr><tr><td>H</td><td>6</td><td>25% completed</td><td>5</td></tr><tr><td>F</td><td>10</td><td>Started early</td><td>9</td></tr></tbody></table> I, J, K and L are yet to start. <table><thead><tr><th>Activity</th><th>Description</th><th>Predecessor</th><th>Duration (Weeks)</th></tr></thead><tbody><tr><td>A</td><td>Site Clearing & Mobilization</td><td>—</td><td>3</td></tr><tr><td>B</td><td>Excavation</td><td>A</td><td>5</td></tr><tr><td>C</td><td>Foundation Work</td><td>B</td><td>6</td></tr><tr><td>D</td><td>Basement Slab</td><td>C</td><td>4</td></tr><tr><td>E</td><td>RCC Frame Floors 1–15</td><td>D</td><td>8</td></tr><tr><td>F</td><td>RCC Frame Floors 16–40</td><td>E</td><td>10</td></tr><tr><td>G</td><td>Electrical Services</td><td>E</td><td>7</td></tr><tr><td>H</td><td>Plumbing Services</td><td>E</td><td>6</td></tr><tr><td>I</td><td>External Cladding</td><td>F</td><td>5</td></tr><tr><td>J</td><td>Internal Finishing</td><td>G, H</td><td>9</td></tr><tr><td>K</td><td>Lift & HVAC Installation</td><td>F</td><td>6</td></tr><tr><td>L</td><td>Final Testing & Handover</td><td>I, J, K</td><td>4</td></tr></tbody></table>						Activity	Original Duration	Actual Status	Remaining Duration	E	8	50% completed	5	G	7	Slow due to labour shortage	6	H	6	25% completed	5	F	10	Started early	9	Activity	Description	Predecessor	Duration (Weeks)	A	Site Clearing & Mobilization	—	3	B	Excavation	A	5	C	Foundation Work	B	6	D	Basement Slab	C	4	E	RCC Frame Floors 1–15	D	8	F	RCC Frame Floors 16–40	E	10	G	Electrical Services	E	7	H	Plumbing Services	E	6	I	External Cladding	F	5	J	Internal Finishing	G, H	9	K	Lift & HVAC Installation	F	6	L	Final Testing & Handover	I, J, K	4
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5b	Comment about how integrated approach helps in the construction of rigid pavement road construction project in a metro city Mumbai.	10	CO2	BL3	7																																																																								
6a	A highway construction project has following activities	10	CO2	BL3	1																																																																								
<table><thead><tr><th>Sr. no</th><th>Activity</th><th>Durations in weeks</th><th>Fund Requirement (₹)</th></tr></thead><tbody><tr><td>1</td><td>1-2</td><td>3</td><td>95,000</td></tr><tr><td>2</td><td>1-3</td><td>8</td><td>2,75,000</td></tr><tr><td>3</td><td>2-4</td><td>6</td><td>2,10,000</td></tr><tr><td>4</td><td>3-4</td><td>4</td><td>1,60,000</td></tr><tr><td>5</td><td>3-5</td><td>7</td><td>2,95,000</td></tr><tr><td>6</td><td>4-6</td><td>5</td><td>2,40,000</td></tr><tr><td>7</td><td>5-6</td><td>4</td><td>1,85,000</td></tr></tbody></table>						Sr. no	Activity	Durations in weeks	Fund Requirement (₹)	1	1-2	3	95,000	2	1-3	8	2,75,000	3	2-4	6	2,10,000	4	3-4	4	1,60,000	5	3-5	7	2,95,000	6	4-6	5	2,40,000	7	5-6	4	1,85,000																																								
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	a. Draw the network diagram. b. Determine: i. Earliest Event Times (EET) ii. Latest Event Times (LET) c. Identify the critical path. d. Prepare: i. Schedule of fund requirement based on EFT ii. Schedule of fund requirement based on LFT e. Compare cumulative fund requirements for EFT and LFT schedules f. Plot cumulative S curve for project expenditure				
6b	You are appointed as a project management consultant for the rigid pavement construction project, discuss project from planning context and Risk management, safety & quality management so that successful delivery of project is possible.	10	CO3	BL3	2,3,4,5
7a	A contractor is executing a 30-storey high-rise in Mumbai, Andheri (w). Midway, the client requests additional basement parking. Apply scope management techniques to control this variation and explain its impact on schedule and cost.	10	CO2	BL2	3,4
7b	A flyover construction is going on in Andheri West, is delayed due to continuous rainfall, late approval from authority and traffic diversion issues. Propose monitoring indicators and remedial measures to balance project progress with stakeholder satisfaction.	10	CO3	BL3	2,3,4



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End Semester Examination/ Re-Examination, May /June 2026

first Year M.tech Sem-II

Max. Marks: 100

Class: F.Y.M.Tech

Name of the Course:

Course Code : PC-MTCM202

Duration: 3 HRS

Program: MTech(CM)

Semester: II
Project Appraisal, Planning and Scheduling

21/5/26

Instructions:

1. Draw neat diagrams
2. Assume suitable data if necessary and state the clearly.

Question No					Maximum Marks	Course Outcome Number	Module No.																																																						
Q1-A	ACTIVITY	TIME	Immediate predecessors	Labors	10	1,2	4																																																						
	A	2	-----	3																																																									
	B	4	A	2																																																									
	C	6	A	4																																																									
	D	9	A	3																																																									
	E	5	B	4																																																									
	F	7	B,C	2																																																									
	G	3	D,E,F	4																																																									
Level the resources so that you may not use more than nine labors per day at any time.																																																													
Q1-B	Resource smoothing is an optimization technique aimed at minimizing fluctuations in resource demand without affecting project duration. Discuss the statement in detail with suitable project-based illustrations.				10	1,2	4																																																						
Q2	<table><tr><th rowspan="2">Activity</th><th colspan="2">Time(in weeks)</th><th colspan="2">Cost(in Rs)</th></tr><tr><th>Normal</th><th>Crash</th><th>Normal</th><th>Crash</th></tr><tr><td>1-2</td><td>8</td><td>4</td><td>3000</td><td>6000</td></tr><tr><td>1-3</td><td>5</td><td>3</td><td>4000</td><td>8000</td></tr><tr><td>2-4</td><td>9</td><td>6</td><td>4000</td><td>5500</td></tr><tr><td>3-5</td><td>7</td><td>5</td><td>2000</td><td>3200</td></tr><tr><td>2-5</td><td>5</td><td>1</td><td>8000</td><td>12000</td></tr><tr><td>4-6</td><td>3</td><td>2.5</td><td>10000</td><td>11200</td></tr><tr><td>5-6</td><td>6</td><td>2</td><td>4000</td><td>6800</td></tr><tr><td>6-7</td><td>10</td><td>7</td><td>6000</td><td>8700</td></tr><tr><td>5-7</td><td>9</td><td>5</td><td>4200</td><td>9000</td></tr></table>				Activity	Time(in weeks)		Cost(in Rs)		Normal	Crash	Normal	Crash	1-2	8	4	3000	6000	1-3	5	3	4000	8000	2-4	9	6	4000	5500	3-5	7	5	2000	3200	2-5	5	1	8000	12000	4-6	3	2.5	10000	11200	5-6	6	2	4000	6800	6-7	10	7	6000	8700	5-7	9	5	4200	9000	20	2	5
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	Indirect cost 2000 per week. The activities involved in the construction of a certain project are given in Table. Crash the CPM model to find out optimum cost and time.																
Q3-A	A project may appear profitable at the initial stage, but without proper appraisal it may fail during execution and operation. In this context, explain the concept of project appraisal and discuss in detail the various methods of project appraisal carried out before sanctioning a project. Explain the importance of: Economic analysis, Financial analysis, Market analysis, Technical analysis, Managerial competence analysis, and Ecological analysis in determining the feasibility, viability, and long-term sustainability of a project.		10	2,3	1												
Q3-B	Explain the complete project selection process adopted for identification and selection of a feasible project. Discuss in detail the various stages involved in project selection such as: idea generation, scouting for project ideas, preliminary screening, SWOT analysis, project rating index, and role of entrepreneurial qualities in selecting the most promising project opportunity.		10	2,3	1												
Q4-A	Explain the various stages of planning carried out by different agencies in a construction project. Discuss in detail the planning functions performed by the owner and the contractor during project execution.		10	1,3	2												
Q4-B	Explain the complete process of Project Scheduling in project management. Discuss in detail all the major stages involved in developing a project schedule, including Plan Schedule Management, Define Activities, Sequence Activities, Estimate Activity Resources, Estimate Activity Durations, and Develop Schedule.		10	1,3	2												
Q5-A	<table><tr><th>ACTIVITY</th><th>TIME</th></tr><tr><td>1-2</td><td>4</td></tr><tr><td>1-3</td><td>2</td></tr><tr><td>1-4</td><td>3</td></tr><tr><td>2-4</td><td>5</td></tr><tr><td>3-4</td><td>6</td></tr></table>	ACTIVITY	TIME	1-2	4	1-3	2	1-4	3	2-4	5	3-4	6		10	2	3
ACTIVITY	TIME																
1-2	4																
1-3	2																
1-4	3																
2-4	5																
3-4	6																

	C- Solve for Internal rate of return <table><tr><th>Year</th><th>Cashflows</th></tr><tr><td>0</td><td>-1000000</td></tr><tr><td>1</td><td>30000</td></tr><tr><td>2</td><td>30000</td></tr><tr><td>3</td><td>40000</td></tr><tr><td>4</td><td>45000</td></tr></table> D- Explain non-discounting methods.	Year	Cashflows	0	-1000000	1	30000	2	30000	3	40000	4	45000	05		
Year	Cashflows															
0	-1000000															
1	30000															
2	30000															
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4	45000															
Q7-A	Analyze the major barriers in the successful implementation of Augmented Reality (AR) in construction projects. In your answer, discuss issues related to cost, training requirements, device limitations, and site conditions, and suggest how these challenges can be addressed for better adoption.	10	4	7												
Q7-B	Scenario analysis is an important pre-emptive risk management tool in construction project planning, but it has several limitations. Explain the major challenges of scenario analysis in detail, including issues related to data reliability, subjectivity and cognitive bias, over-complexity in modeling, false sense of security, and high cost and resource requirements. Also discuss how these limitations can affect project decision-making.	10	4	7												



Bharatiya Vidya Bhavan's SARDAR PATEL COLLEGE OF ENGINEERING

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first Year

END SEMESTER EXAM- MAY/JUNE 2026

Program: Civil Engineering with specialization of Construction Management

Duration: 3 hrs.

M.tech Sem - II

Course Code: PE-MTCM 211

Maximum Points: 100

Course Name: Risk & Value Management

Semester: II

Notes:

26/05/26

1. Q.1 is a compulsory and solve any four out of remaining six
2. Illustrate answer with neat sketches wherever required.
3. Make suitable assumptions where necessary and state them clearly.

Q.No.	Questions	Points	BL	CO	Module																
1	Solve any four: A. Factors responsible for risk in construction work. B. Barriers to risk identification. (Any five) C. Risk Matrix D. Purpose of risk monitoring. E. Make a list of reasons for poor value.	20	1,2	1-4	1-7																
2	A. Explain the concept of risk management. Describe various construction risks such as financial, technical, legal, and environmental risks. B. Define: Risk Management. Discuss any four objectives of risk management. C. Discuss any five sources of risks in construction project.	10+05 +05	1,2	1-3	2,3																
3	A. A farmer wants to decide which one of the three crops should be planted on his 100-acre farm. The profit depends upon the rainfall during the growing season. Rainfall conditions are classified as High, Medium, and Low. The estimated conditional profits (in ₹) are given below: <table><tr><th>Rainfall</th><th>Crop A</th><th>Crop B</th><th>Crop C</th></tr><tr><td>High</td><td>8000</td><td>3500</td><td>5000</td></tr><tr><td>Medium</td><td>4500</td><td>4500</td><td>5000</td></tr><tr><td>Low</td><td>2000</td><td>5000</td><td>4000</td></tr></table> If the farmer wishes to plant only one crop, determine the best alternative using the following decision criteria: (Maximax Criterion , Maximin Criterion , Laplace Criterion , Minimax Regret Criterion , Hurwicz Criterion (Coefficient of optimism = 0.6)) B. Define: Risk Identification. Discuss advantages and	Rainfall	Crop A	Crop B	Crop C	High	8000	3500	5000	Medium	4500	4500	5000	Low	2000	5000	4000	10+05 +05	1,2	1-3	1-3
Rainfall	Crop A	Crop B	Crop C																		
High	8000	3500	5000																		
Medium	4500	4500	5000																		
Low	2000	5000	4000																		



Mumbai - 400058

	disadvantages of risk identification. C. What do you mean by risk register? Make a list of purposes of risk register.																
4	A. Define risk response. Discuss the tools and techniques used for managing positive and negative risks in construction projects. B. A construction project has the following possible profit outcomes and their probabilities: <table><tr><td>Outcome</td><td>Profit (₹ lakh)</td><td>Probability</td></tr><tr><td>Geological issues</td><td>-10</td><td>0.2</td></tr><tr><td>Normal progress</td><td>20</td><td>0.5</td></tr><tr><td>Fast completion bonus</td><td>35</td><td>0.3</td></tr></table> Calculate: Expected profit, Variance, Standard deviation Coefficient of variation) C. Discuss the key sources of residual risks in construction project.	Outcome	Profit (₹ lakh)	Probability	Geological issues	-10	0.2	Normal progress	20	0.5	Fast completion bonus	35	0.3	10+05 +05	1,2	1-3	2,3
Outcome	Profit (₹ lakh)	Probability															
Geological issues	-10	0.2															
Normal progress	20	0.5															
Fast completion bonus	35	0.3															
5	A. Discuss the key risk control areas in construction projects with suitable examples. B. Define construction insurance. Discuss different types of construction insurance policies available for construction projects. C. Compare Owner Controlled Insurance Program (OCIP) and Contractor Controlled Insurance Program (CCIP) used in construction projects.	10+05 +05	1	1-3	3,4												
6	A. Discuss the various stages involved in value analysis process in detail. B. Define: Value Engineering. Discuss any five objectives of value engineering. C. Write a short note on: Principles of Value Analysis.	10+05 +05	2	4	6												
7	A. What do you mean by Value Management? Explain the techniques and tools used in value management. B. Compare value management and cost management in construction projects. C. Make a list of stakeholders and their challenges in value management studies.	10+05 +05	1,2	4	7												



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2026 Examinations – END - SEM

SET B

Semester: II

M.Tech

First Year M.tech Civil

Program: M Tech

Course Code: AE MTSE 201

Course Name: English For Technical Paper Writing

English for Research Paper Writing

Duration: **03 hours**

Maximum Points: **100**

29/05/26

Note:

- Question 01 is Compulsory
- Total Seven Questions
- Out of remaining 06 questions attempt any four
- Attempt main questions and sub questions together.

Sr.No	Questions	Poi nts	CO	BL
Q.1.	Attempt ANY TWO Questions 1. Explain the major characteristics of academic and technical writing. How do they differ from general writing? 2. What is a research abstract? Discuss its purpose and major components. 3. Explain the significance of audience awareness in technical communication with suitable examples. 4. Conduct a SWOT analysis of an engineering sector related to your specialization.	20	01, 2,3 ,4, 5,6 ,7	02
Q.2.	The paragraph below lacks structure and clarity. Rewrite it using the MAP method. Paragraph A. During the fourth phase of metro tunnel excavation, the geotechnical monitoring team recorded differential ground settlement beyond the permissible threshold near the retaining wall. Field measurements indicated that excessive groundwater ingress and delayed grouting operations had contributed to the instability. Subsequent analysis showed that unless corrective measures are implemented immediately, adjacent utility lines may be affected. The site engineering committee therefore recommended continuous settlement monitoring, pressure grouting, and	20	02	L3

	revision of excavation sequencing to control further displacement. Paragraph B Testing of a three-phase power distribution panel in the laboratory revealed abnormal harmonic distortion under fluctuating load conditions. Measurements obtained through the power quality analyzer showed total harmonic distortion values exceeding the recommended standards. Technical examination indicated that nonlinear loads connected to the system were the principal source of distortion. If left unresolved, the condition may reduce equipment efficiency and shorten component life. The electrical maintenance team has proposed harmonic filters, periodic load balancing, and continuous monitoring of system performance.			
Q.3.	Identify and Explain the PEEL structure (Point, Evidence, Explanation, Link) in the following paragraphs. Paragraph A Sustainable transportation systems have become essential for urban development. A recent report published by the International Energy Agency indicates that electric public transit networks can significantly reduce carbon emissions in metropolitan regions. However, the report also notes that long-term sustainability depends upon reliable energy infrastructure and lifecycle battery management. This evidence suggests that transportation planning must combine technological innovation with environmental accountability. Therefore, engineers must adopt integrated strategies that address both operational efficiency and ecological responsibility. Paragraph B Automation is rapidly transforming industrial manufacturing processes. According to recent studies in the <i>Journal of Manufacturing Systems</i>, automated inspection systems improve production accuracy and reduce operational downtime. Nevertheless, researchers have also observed that excessive dependence on automation may reduce human intervention during critical failures. This demonstrates that productivity gains should be balanced with human oversight and adaptive decision-making. Hence, effective industrial automation requires both technical advancement and responsible management practices.	20	3	L1
Q.4.A	Discuss the importance of coherence, precision, and objectivity in technical report writing. Why are these qualities especially important in engineering communication? Differentiate between the following with suitable engineering examples: - Progress report and feasibility report - Periodic report and Inventory report	10	3	L2
Q.4.B	Your classmate was absent for the lecture on "Planning and Delivering Technical Presentations." He has to deliver a seminar presentation next week. Explain in detail:	10	4	L4

	• How to define the objective of the presentation • How to structure the content logically • How to use the Pyramid Principle for organizing arguments • Techniques of effective delivery (voice, body language, eye contact, time management) Talk Power Program • Guidelines for designing effective PowerPoint slides			
Q.5.A	Rewrite the following passive voice sentences into active voice. Explain when passive voice might be preferred in academic writing. Sentences: a) The experiment was conducted by the research team. b) The proposal was approved by the committee. c) The data was analyzed using SPSS. d) The paper was written by a group of scholars. e) The solution was heated until it boiled.	10	1	L6
Q.5.B	Your classmate was absent for the lecture on “Planning and Delivering Technical Presentations.” He has to deliver a seminar presentation next week. Explain in detail: • how to define the objective of the presentation • how to structure the content logically • how to use the Pyramid Principle for organizing arguments • techniques of effective delivery (voice, body language, eye contact, time management) • guidelines for designing effective PowerPoint slides	10	2	L4
Q.6.A	Describe the selection interview process in detail. Explain the following types of interviews with suitable examples: • Technical interview • HR interview • Panel interview • Stress interview • Behavioural interview	10	4	L2
Q.6.B	Explain how research grant proposals differ from industrial/technical project proposals in terms of objectives, audience, tone, and evaluation criteria. Prepare a brief research grant proposal outline (main headings with 1–2 bullet points each) on the topic: <i>“Integrating Renewable Energy Solutions in Urban Public Transport Systems.”</i>	10		
Q.6.B	Write a detailed Feasibility report for the following situation. Include all standard report components (Title, to/from, date, subject, introduction, body with headings/subheadings, findings, conclusions, recommendations, etc.) and indicate the format (Memo or Letter) clearly. You are appointed the coordinator of the Research and Development Cell at Sardar Patel College of Engineering. The principal has instructed you to prepare a feasibility report on establishing a <i>Central Research Innovation Hub</i> with shared laboratories, writing support cell, and industry-	20	5	L3

	collaboration desk for PG and PhD students.				
Q.7.A	In response to the advertisement below, prepare: A. Cover Letter B. Detailed Resume Exciting Research Career Opportunity for Engineers Organization: Indian Institute of Advanced Technology (IIAT) – Centre for Emerging Materials & Smart Systems Position: Junior Research Fellow (JRF) – Smart Infrastructure Monitoring Eligible Branches: Civil, Mechanical, Electrical, Electronics Eligible Students: M.Tech (Batch of 2026) – Final Year Location: Bengaluru (with project-related field visits across India) What We Offer: • Opportunity to work on a government-funded multi-institutional research project • Hands-on experience with sensors, data acquisition, and structural health monitoring • Possibility of PhD conversion based on performance • Stipend as per funding agency norms Eligibility Criteria: • Currently pursuing M.Tech in Civil / Mechanical / Electrical / Electronics Engineering • Minimum 60% aggregate or equivalent CGPA in all previous semesters • Strong fundamentals in core engineering and basic programming • Demonstrated interest in research (projects, seminars, publications, or internships) • Good written and oral communication skills and ability to work in a team Prepare a formal cover letter applying for this position and attach a well-structured CV suited to a research role.	20	4	L6	03



Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

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Munshi Nagar, Andheri (W) Mumbai - 400058

END SEMESTER - MAY 2026 / RE-EXAM JULY 2026



Program: F. Y. M. Tech

First Year M.tech

Duration: 3 Hours

Course Code: AE-MTCM202, AE-MTSE202

Civil

Maximum Points: 100

Course Name: Project Planning and Management

Semester: II

Notes: 1 Answer any five questions.

2 All questions carry 20 points.

Sem-II

29/05/26

Q.No.	Questions	Points	CO	BL	Module No.
1	1.1 Write a brief note on i) Project and ii) Project Management	10	1	2	2
	1.2 What are the attributes or skills that a Project Manager should have?	10	1	2	2
2	2.1 Explain Project Life Cycle and Project Life Cycle features	10	1	3	3
	2.2 Explain Project Management principles, list the six PM principles describing each of them	10	1	3	4
3	3.1 List three areas of CSA responsibility and ten items of CSA Discipline work scope	10	3	2	1
	3.2 Write a note on Method statement in construction. What are the objectives of Constructability Reviews?	10	3	3	5
4	4.1 List out at least ten points defining the scope of a contour and traverse survey for a project plot.	10	2	2	1
	4.2 List six soil properties and four recommendations for pile foundations that you would ask for in the final geo-technical report	10	2	3	1



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END SEMESTER - MAY 2026 / RE-EXAM JULY 2026



Program: F. Y. M. Tech

Duration: 3 Hours

Course Code: AE-MTCM202, AE-MTSE202

Maximum Points: 100

Course Name: Project Planning and Management

Semester: II

Notes: 1 Answer any five questions.

2 All questions carry 20 points.

Q.No.	Questions	Points	CO	BL	Module No.
5	5.1 What is Civil, Structural, Architectural Design basis? Explain its importance and list ten of the most important design requirements that should be contained in the Design Basis.	10	3	2	2
	5.2 Why is quantity/cost monitoring important during execution of a CSA item-rate contract? How is quantity monitoring done during the project execution?	10	3	3	3
6	6.1 Explain Strength, Stiffness, Stability and Ductility at the element and system levels	10	4	4	3
	6.2 Explain the features and purpose of a multi-discipline 3D CAD Model for Process plants	10	3	3	4
7	7.1 List ten factors to be considered while developing a plot plan/layout for an industrial plant.	10	4	2	2
	7.2 In five areas, explain how structural engineers can overcome the challenges faced by the profession.	10	4	5	5



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Sardar Patel College of Engineering

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Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Examination/ Re-Examination, May /June 2026



First Year M.Tech Civil

Max. Marks: 100

Class: F.Y.M.Tech

Semester: II

Duration: 3 HRS

Program: MTech(CM)

Name of the Course: Operations Research

Code : OE-MTCM201

Sem - II

02/06/26

Instructions:

1. Draw neat diagrams
2. Assume suitable data if necessary and state the clearly.

Question No		Maximum Marks	Course Outcome Number	Modu No.																		
Q1-A	Solve following LPP using Revised simplex method (Standard form-I) method- Max $Z = X_1 + 2X_2$ Subject to, $X_1 + X_2 \leq 3$ $X_1 + X_2 \leq 5$ $3X_1 + X_2 \leq 6$ $X_1, X_2, X_3 \geq 0$	20	1	2																		
Q-I-B	There are 5 jobs, each of which has to go through the machines A and B in the order AB. The processing times (in hours) are given as <table><tr><th>Job</th><th>J1</th><th>J2</th><th>J3</th><th>J4</th><th>J5</th></tr><tr><td>Machine A</td><td>2</td><td>4</td><td>5</td><td>7</td><td>1</td></tr><tr><td>Machine B</td><td>3</td><td>6</td><td>1</td><td>4</td><td>8</td></tr></table> Determine a sequence of these jobs that will minimize the total elapsed time T. Also obtain: i) the minimum elapsed time; and ii) the idle time for each of the machines.	Job	J1	J2	J3	J4	J5	Machine A	2	4	5	7	1	Machine B	3	6	1	4	8	10	3,2	4
Job	J1	J2	J3	J4	J5																	
Machine A	2	4	5	7	1																	
Machine B	3	6	1	4	8																	
Q2 A	1.Explain all types of cost involved in Deterministic inventory model.	10	3	7																		

	2. If for a project, annual demand is 10000/year, order cost=300/order, carrying cost = Rs 4/unit/year then- a) Estimate Economic order quantity and Total cost of project according to continuous demand instantaneous replenishment model. b) Draw graphs for all types of costs in EOQ concept.			
Q2 B	Derive formulae for total cost and EOQ for continuous demand instantaneous replenishment model with backordering.	10	3	7
Q3- A	Solve by Kunh-tucker Conditions- Minimize $F(X) = X_1^2 + X_2^2 + 60 X_1$ Subject to, $g1 = X_1 - 80 \geq 0$ $g2 = X_1 + X_2 - 120 \geq 0$ $X_1, X_2 \geq 0$	10	2	3
Q3 -B	A retail store stocks two types of shirts A and B. These are packed in attractive cardboard boxes. During a week the store can sell a maximum of 400 shirts of type A and a maximum of 300 shirts of type B. The storage capacity, however, is limited to a maximum of 600 of both types combined. Type A shirt fetches a profit of Rs. 2/- per unit and type B a profit of Rs. 5/- per unit. How many of each type the store should stock per week to maximize the total profit? Formulate a LPP model of the problem.	10	2	1
Q4	Minimise $f(x) = 7 * X_1 * X_2^{-1} + 3 * X_2 * X_3^{-2} + 5 * X_1^{-3} * X_2 * X_3 + X_1 * X_2 * X_3$ Where, $X_1, X_2, X_3 \geq 0$ Solve above model using geometric programming	20	4	5
Q5	Consider following parametric linear programming problem- Max $Z = (10 - 2t)X_1 + (5 - 3t)X_2$ S.T. $8X_1 + 2X_2 \leq 48$ $2X_1 + 4X_2 \leq 24$ $X_1, X_2, t \geq 0$	20	4	6

Perform parametric analysis with respect to objective function coefficient and find the range of t over which optimal solution will not change.
Use following linear programming The optimum table –

C _B	Basic variable	C _j				Solution
		10	5	0	0	
10	X ₁	1	0	1/7	-1/14	36/7
5	X ₂	0	1	-1/14	2/7	24/7
	Z _j	10	5	15/14	5/7	480/7
	C _j - Z _j	0	0	-15/14	-5/7	

Q 6 A

Write Dual form of following LPP-

$$\text{Max } Z = X_1 + 3X_2$$

$$\text{Subject to, } 3X_1 + 2X_2 \leq 6$$

$$3X_1 + X_2 = 4$$

$$X_1, X_2 \geq 0$$

10

1

2

Q6 -B

A small project is composed of 7 activities whose time estimates are listed below. Activities are being identified by their beginning (i) and ending (j) node numbers.

Activities		Time in weeks		
i	j	t _a	t _e	t _p
	2	1	1	7
1	3	1	4	7
1	4	2	2	8
2	5	1	1	1
3	5	2	5	14
4	6	2	5	8
5	6	3	6	15

1. Draw the network
2. Calculate the expected variances for each
3. Find the expected project completed time
4. Calculate the probability that the project will be completed at least 3 weeks than expected
5. If the project due date is 18 weeks, what is the probability of not meeting the due date?

10

3

3

Q7	Solve Following LPP by Simplex method- Max $Z = 23X_1 + 32X_2$ Subject to, $10X_1 + 6X_2 \leq 2500$ $5X_1 + 10X_2 \leq 2000$ $X_1 + 2X_2 \leq 500$ $X_1, X_2 \geq 0$.	20	1	3
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End Semester Examination/ Re-Examination, May /June 2026



Max. Marks: 100

Class: MTech CM/SE

Name of the Course: Legal Aspects In Construction

*First Year M.tech
Civil*

Semester: II

Duration: 3 hours

Program: M Tech

Course Code : OEMTCM202

Instructions:

Questions to be attempted in the series

Question No. 1 is compulsory

Sem - II

02/06/26

Question No		Maximum Marks	Course Outcome Number	Module No.
Q1 A	MCQ's	15	1, 2, 3, 4	1, 2, 3, 4, 5, 6
	1. An agreement which is enforceable by law at the option of one or more of the parties thereto, but not at the option of the other, is a.....: (a) Valid contract (b) Unenforceable contract (c) Voidable contract (d) Void agreement 2. In case of illegal agreements, the collateral agreements are: (a) Valid (b) Voidable (c) Void (d) None 3. If the contract is illegally terminated, the contractor can demand claims on a percentage basis. (a) % of overhead on remaining work (b) % of loss of profit on remaining work 4. As per Section 62 of the Indian Contract Act, additions, alterations in the contract can be made: (a) Unilaterally by any party (b) The contract cannot be changed			

	(c) Only by consent of both parties to the contract. 5. If a party does not co-operate in constituting an Arbitral Tribunal, the Court can appoint an arbitrator under Section _____ of the Arbitration and Conciliation Act, 1996 (a) Section 34 (b) Section 11 (c) Section 16 6. In absence of any provision in the contract in respect of variation in quantity, the Supreme Court of India laid down the law for considering the variations as: (a) +/- 10% (b) +/- 20% (c) +/- 30% (d) +/- 40% 7. If an offer is required to be kept valid for certain days from the date of submission of an offer, it is called: (a) Contingent contract (b) Option contract (c) Void contract 8. Acceptance of an offer with additional terms in the work order is said to be: (a) Counter offer (b) Absolute Acceptance (c) Rejection of an offer. 9. Before any change is made in a Contract, Notice is mandatory a) True b) False 10. A entered a Contract with B with an understanding that the contract would come into existence after A would get acceptance from the Competent Authority. The validity of the bid was 6 months. Can B withdraw the offer before 6 months? a) Yes b) No 11. In absence of an arbitration clause in the contract, one party can still insist on arbitration.			
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	i) True ii) False 12. There is no special act in India for engineering contracts. i) True ii) False 13. If the Employer insists on signing the Bills, No Claims Certificate etc. for which the Contractor is not willing but has no choice but to sign it, in that event, the remedy available for the Contractor is; a) Not to sign it b) Has to sign it (can it be Must sign it) c) Can sign under protest 14. If the Employer does not allow the Contractor to sign a certain document under protest, what is the legal remedy available with contractor which can create his rights by using the doctrine of a) Res judicata b) Estoppel c) Coercion 15. When both the parties simultaneously delay their part of an obligation then such an act is said to be a a) Breach by both parties b) Breach of promise c) Concurrent delay d) Critical delay			
Q1 B	Write a note on the Workmen's Compensation Act, 1923	05	4	6
Q2 A	Discuss the Legal, contractor and practical remedies A construction project is awarded to M/S XYZ to be completed in 24 months. For the first 10 months, the project is delayed due to the lack of environmental permission. The owner promised to give an extension of time to complete the work at the appropriate time. At the time of extension, the Owner levied LD. What is the remedy with the Contractor?	15	2	2, 4
Q2B	Enlist various types of Construction Contracts and explain the BOT contract.	05	3	3
Q3 A	What is FIDIC? Advantages, Disadvantages and colour Coding	15	3	7
Q3 B	Enlist in sequence the Stages and Parts in the Tendering process	05	3	3

Q4 A	Write a short note on the following Acts Contract Labours Act Professional Liability	10	4	6
Q4 B	Enlist the various ADR and explain Mini Jury Trial	10	4	5
Q5 A	Explain the doctrine of 1. Good Faith 2. Privity of contract 3. Waiver 4. Constructive Notice 5. Notice	10	2	2
Q5 B	Enlist the different types of claims in a construction contract and discuss the claim for loss of profit.	10	2	4
Q6 A	A contractor was engaged in the construction of a hospital project. Due to delays attributable to the employer, the contractor seeks compensation for head office overheads and loss of profit. The following data is available: • Contract Value: ₹ 200 crore • Contract Duration: 36months • Actual Duration (including delay): 50 months • Delay attributable to employer: 10 months • Contractor's audited annual head office overheads: ₹ 20 crore • Annual turnover of contractor: ₹ 250 crore • Overhead (expected): 8% of contract value Calculate damages based on Hudson, Emden and Eichleay Formulas.	15	2, 3	4
Q6 B	Enlist the essential conditions of the construction contract	05	3	3
Q7 A	A contractor was awarded a contract for the construction of a municipal office building. • Original Contract Value: ₹ 100 crore • Work Completed: ₹ 20 crore • The Employer terminated the contract. The contractor seeks compensation for loss of profit on the unexecuted portion of the contract. Calculate the loss of profit with detailed calculations, assuming a loss of profit @12%	10	2, 3	4
Q7 B	Enlist the Rules of interpretation of a Contract and explain any one rule in detail.	10	2	2



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End Semester Examination/ ~~Re-Examination~~, May / ~~June~~ 2026



First Year

Sem - II

Max. Marks: 100

Duration: 03 Hours

Class: FY M. Tech. Civil/Electrical Engineering, Semester: II

Program: PG

Name of the Course: Artificial Intelligence in Engineering

Course Code: OE-MTCM205/OE-MTSE205

02/06/26

Instructions:

- Attempt any five questions.
- Answer to all sub questions should be grouped together.
- Figure to right indicates full marks.
- Assume suitable data wherever necessary and state it clearly.

Question No.		Maximum Marks	Course Outcome Number	Module No.
Q1.	(a) What are data driven methods? What are the advantages of data driven methods over the traditional methods? State its engineering applications with an example.	10	1	1
	(b) How are digital computers comparable to human brain? Explain the concept of computing and state the characteristics of soft computing.	10	1	1
Q2.	(a) What is fuzzy logic? Explain in brief fuzzy set, crisp set, fuzzy logic and probability.	10	1	2
	(b) Discuss the role of membership function in Fuzzy logic. Explain its various types.	10	2	2
Q3.	(a) Explain the working of Artificial Neural Networks (ANN) with neat sketch. State the importance of every terminology used in ANN.	10	2	3
	(b) Explain Machine learning with supervised learning, unsupervised learning and reinforcement learning with an example.	10	2	3
Q4.	(a) What are the limitations of traditional optimization approaches? Discuss Genetic Algorithm (GA) as a	10	1	4

	probabilistic search method and the principle on which it works.			
	(b)Deliberate applications of Genetic Algorithm (GA) in engineering.	10	2	4
Q5.	(a)What is Genetic Programming (GP)? Discuss role of terminal set, function set, fitness measure, parameters and termination criteria with result designation in GP.	10	2	4
	(b) Explain the important requirement of closure property and sufficiency property in the Genetic Programming (GP). Also explain control parameters used in GP.	10	2	4
Q6.	(a) Explain the importance of Model tree (MT) technique in data mining. State and explain the principle on which Model tree works.	10	2	4
	(b) Differentiate Classification vs. association rules used in data mining and decision making. Give an example	10	2	5
Q7.	Write short notes on:			
	(a) Fuzzy logic controlled genetic algorithms	05	1	5
	(b) Genetic algorithm based back propagation network	05	1	5
	(c) Neuro genetic hybrids	05	1	5
	(d) Fuzzy back propagation networks	05	1	5



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End Semester Examination/ ~~Re-Examination~~, May /June 2026



First Year M.Tech Civil

Max. Marks:100

Duration: 3 Hours

Class: F.Y.M.Tech

Semester: II

Sem-II

Program: construction Management

Name of the Course: Management of Construction Resources

Course Code : PE-MTCM221

04/06/26

Instructions:

1. Attempt any **FIVE** questions out of **SEVEN** questions.
2. Answers to all sub questions should be grouped together.
3. Assume suitable data if necessary and state the same clearly.

Question No		Maximum Marks	Course Outcome Number	Module No.
Q.1 (a)	Discuss various methods of deciding worker remuneration in construction projects. Evaluate their suitability based on work type, productivity, and motivation, and recommend the most appropriate method for a large infrastructure project.	10	1	2
Q.1 (b)	Discuss the importance of collective bargaining for labour management and How would you apply collective bargaining to resolve wage disputes at a construction site?	10	1	1
Q.2 (a)	List and briefly explain the techniques used for manpower planning in construction organizations.	10	1	2
Q.2 (b)	Explain the process of Material management planning in construction also explain how does material planning help in avoiding shortage and excess inventory.	10	3	5
Q.3 (a)	Discuss recruitment and selection procedures for project staff.	10	1	1
Q.3 (b)	Explain the concept of sizing and matching of construction equipment. Analyze how improper matching affects productivity, cost, and project time.	10	2	3
Q.4 (a)	A wheel loader was purchased at a delivered price of	12	2	4

	₹2,80,00,000/-, including tire cost of ₹11,00,000/-. The following data are available: 1. Interest rate = 8% 2. Insurance = 2% 3. Taxes = 3% 4. Expected annual operating hours = 1800 hr 5. Total expected operating life = 24,000 hr 6. Fuel cost = ₹72/litre 7. Operator cost = ₹250/hr 8. Equipment horsepower = 300 hp 9. Expected tire life under average working conditions = 2400 hr 10. Salvage value = 15% of initial cost (purchase cost less tire cost) 11. Repair and maintenance cost = 35% of depreciation cost 12. Tire repair cost = 12% of straight-line depreciated tire cost 13. The equipment operates at 75% of rated power for 60% of the cycle time (during haul cycle with load)and not more than 40% of rated power for the remaining 40% of the cycle time 14. Time factor = 55 min/hr 15. Diesel consumption = 0.13 lit/hr/hp Using the Peurifoy Method, calculate: a) Ownership cost per hour b) Operating cost per hour c) Total hourly cost of operating the wheel loader.			
Q.4 (b)	Explain the concept and importance of Building Information Modeling in modern construction project management. Compare traditional construction management methods with Building Information Modeling-based project management approaches.	08	4	7
Q.5 (a)	As a construction manager, explain how you would use Oracle Primavera P6 to prepare and manage the schedule of a multi-storey building project include WBS creation, activity sequencing, resource planning, and tracking methods.	10	4	7
Q.5 (b)	A construction project is facing delays due to improper material planning and supplier issues. Analyze the problem and suggest improvements using: (i) MRP(ii) Vendor analysis (iii) Quality assurance	10	3	5

Q.6 (a)	A construction company is executing a commercial building project and maintains the following inventory data for major construction materials: <table><tr><th>Material</th><th>Annual Consumption (Units)</th><th>Unit Cost (₹)</th></tr><tr><td>Reinforcement Steel</td><td>1800</td><td>68000</td></tr><tr><td>Cement Bags</td><td>15000</td><td>450</td></tr><tr><td>Glass panels</td><td>300</td><td>12000</td></tr><tr><td>Tiles</td><td>8000</td><td>650</td></tr><tr><td>Plumbing Fixtures</td><td>500</td><td>5500</td></tr><tr><td>Paint</td><td>900</td><td>3000</td></tr><tr><td>Sand</td><td>2500</td><td>1200</td></tr></table> Using the above data: a) Compute the annual usage value of each material and perform ABC Analysis. b) Classify the materials into A, B, and C categories based on annual usage value. c) Explain the inventory control measures suitable for each category in construction project management.	Material	Annual Consumption (Units)	Unit Cost (₹)	Reinforcement Steel	1800	68000	Cement Bags	15000	450	Glass panels	300	12000	Tiles	8000	650	Plumbing Fixtures	500	5500	Paint	900	3000	Sand	2500	1200	12	3	6
Material	Annual Consumption (Units)	Unit Cost (₹)																										
Reinforcement Steel	1800	68000																										
Cement Bags	15000	450																										
Glass panels	300	12000																										
Tiles	8000	650																										
Plumbing Fixtures	500	5500																										
Paint	900	3000																										
Sand	2500	1200																										
Q.6 (b)	A contractor requires steel bags/units for a bridge construction project. The following information is available: i. Annual demand = 12,000 units ii. Ordering cost = ₹3,500 per order iii. Unit price = ₹2,500 per unit iv. Carrying cost = 15% of unit price annually v. Lead time = 2 weeks Calculate: a) EOQ (Economic Order Quantity) b) Number of orders per year c) Reorder Point	8	3	6																								
Q.7 (a)	A contractor must complete a building project in 8 months	8	2	3																								

	with limited resources. Suggest an appropriate equipment selection and sourcing strategy (buy/rent/lease) with justification.			
Q.7 (b)	A hydraulic excavator was purchased at a delivered price of ₹2,40,00,000/- , Tyre cost = ₹18,00,000/- The following data are available: 1. Interest rate = 10% 2. Insurance = 2% 3. Taxes = 2% 4. Expected annual operating hours = 1800 hr 5. Total expected operating life = 24,000 hr 6. Fuel cost = ₹72/litre 7. Operator wages = ₹250/hr 8. Equipment horsepower = 220 hp 9. Average diesel consumption = 0.08 lit/hr/hp 10. Expected life of tyre for (average working condition) = 3000 hr 11. FOG (Filter, Oil, Grease) factor = 0.12 12. Labour adjustment factor = 0.85 13. Annual repair cost = 7% of the initial cost (less tyre cost) 14. Salvage value = 15% of initial cost (purchase cost less tyre cost) Using the Caterpillar method, calculate: a) Ownership cost per hour b) Operating cost per hour c) Total equipment cost per hour	12	2	4



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END SEM/RE-EXAM EXAMINATION -MAY / JUNE 2026

Program: M. Tech. Construction Management first Duration: 3 hr
 Course code: PC-MTCM-201 Year Maximum Points: 100
 Name of the Course: Project Monitoring and Control Semester: II

13/7/26

Instructions:

1. Question no. 1 is compulsory
2. Attempt any 4 questions out of remaining 6 question.
3. Neat diagrams must be drawn wherever necessary.
4. Figures to the right side indicate full points.
5. Assume Suitable data if necessary and state it clearly

Sem - II

Q. No.	Questions	Points	CO	BL	Module
1 a	Explain the role of method statements in flyover construction monitoring and control. Provide examples of reinforcement and concreting stages.	10	CO2	BL3	1
1 b	Define lean construction and identify typical wastes in high-rise building projects. Discuss how lean principles improve monitoring and control during execution.	10	CO1	BL2	3&4
2a	A Mumbai high-rise project reports frequent unsafe scaffolding practices. Apply the PDCA cycle to design a safety management plan that reduces such risks.	10	CO4	BL3	6
2b	A rigid pavement project has BAC = ₹120 crore. After 8 months: • PV = ₹60 crore • EV = ₹50 crore • AC = ₹70 crore Calculate CPI, SPI, ETC, EAC. Suggest corrective actions for cost and schedule control.	10	CO3	BL3	4
3 a	A rigid pavement road construction is going on, List the records to be maintained on the site for project monitoring and control.	5	CO2	BL1	2,3 &4
3 b	Discuss the quality control and safety plan for A rigid pavement road construction project in a metro city Mumbai.	5	CO2	BL2	6
3 c	Discuss the hazard involved in the construction of A rigid pavement road construction project in a metro city Mumbai and mitigation measures.	5	CO2	BL2	6
3 d	Comment about how integrated approach helps in the A rigid pavement road construction project in a metro city Mumbai for achieving deliverables.	5	CO1	BL3	7
4 a	Highlight the importance of Inspection and checklist in construction project? Prepare checklist for a) Brick work b) Concreting work for Isolated footing	10	CO2	BL2	6,7

4b	On a highway project, a worker slips but is unhurt, another suffers minor injury, and a third case involves a fatal accident. Classify each as incident, near-miss, or accident, and propose preventive measures.	10	CO3	BL2	6																																
5a	It is proposed to update the network at 10 week	10	CO3	BL3	2																																
	• A completed • B (5 weeks) → 4 done, 1 remaining • C (4 weeks) → 2 done, 2 remaining • D not started • E, F not started <table><tr><th>Activity</th><th>Description</th><th>Predecessor</th><th>Duration (Weeks)</th></tr><tr><td>A</td><td>Trenching</td><td>—</td><td>3</td></tr><tr><td>B</td><td>Pipe laying</td><td>A</td><td>5</td></tr><tr><td>C</td><td>Manhole construction</td><td>B</td><td>4</td></tr><tr><td>D</td><td>Backfilling</td><td>B</td><td>3</td></tr><tr><td>E</td><td>Road reinstatement</td><td>C, D</td><td>4</td></tr><tr><td>F</td><td>Testing</td><td>E</td><td>2</td></tr></table> • Update CPM network • Revised duration • Critical path recalculation.					Activity	Description	Predecessor	Duration (Weeks)	A	Trenching	—	3	B	Pipe laying	A	5	C	Manhole construction	B	4	D	Backfilling	B	3	E	Road reinstatement	C, D	4	F	Testing	E	2				
Activity	Description	Predecessor	Duration (Weeks)																																		
A	Trenching	—	3																																		
B	Pipe laying	A	5																																		
C	Manhole construction	B	4																																		
D	Backfilling	B	3																																		
E	Road reinstatement	C, D	4																																		
F	Testing	E	2																																		
5 b	Define quality from different perspectives. Highlight the contribution of different quality Gurus towards quality development.	10	CO2	BL2	6																																
6 a	Draw the network diagram metro station construction work.	10	CO3	BL3	4																																
	<table><tr><th>Sr. No</th><th>Activity</th><th>Duration (weeks)</th><th>Fund Requirement (₹)</th></tr><tr><td>1</td><td>1–2 (Excavation)</td><td>4</td><td>1,20,000</td></tr><tr><td>2</td><td>1–3 (Foundation)</td><td>6</td><td>3,10,000</td></tr><tr><td>3</td><td>2–4 (Column Work)</td><td>5</td><td>2,25,000</td></tr><tr><td>4</td><td>3–4 (Slab Casting)</td><td>7</td><td>3,80,000</td></tr><tr><td>5</td><td>3–5 (Electrical Shaft)</td><td>6</td><td>2,95,000</td></tr><tr><td>6</td><td>4–6 (Finishing)</td><td>5</td><td>2,60,000</td></tr><tr><td>7</td><td>5–6 (Escalator Installation)</td><td>4</td><td>2,05,000</td></tr></table> i. Compute EET and LET. ii. Identify critical path. iii. Prepare EFT vs LFT fund schedules. iv. Compare cumulative requirements. v. Plot S-curve.	Sr. No	Activity	Duration (weeks)	Fund Requirement (₹)	1	1–2 (Excavation)	4	1,20,000	2	1–3 (Foundation)	6	3,10,000	3	2–4 (Column Work)	5	2,25,000	4	3–4 (Slab Casting)	7	3,80,000	5	3–5 (Electrical Shaft)	6	2,95,000	6	4–6 (Finishing)	5	2,60,000	7	5–6 (Escalator Installation)	4	2,05,000				
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6 b	It is proposed to execute a drainage line laying project in Andheri (West).	10	CO2	BL3	2 & 5																																
	Highlight the monitoring and control issues likely to occur, and suggest remedial measures to ensure timely execution, minimize public inconvenience, traffic diversion, to maintain quality standards and other work related issues.																																				

7(a)	A flyover project faces delays because site engineers and design consultants are not aligned. Apply communication management techniques to resolve coordination issues.	10	CO2	BL3	6
7(b)	In a flyover project at Bandra, concreting productivity drops by 20% due to labor absenteeism. Apply monitoring tools to measure productivity and suggest corrective measures	10	CO3	BL3	3



Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W) Mumbai - 400058



RE Exam July 2026

~~END SEMESTER EXAM MAY/JUNE 2026~~

Program: Civil Engineering with specialization of Construction Management

Duration: 3 hrs.

Course Code: PE-MTCM 211

Sem - II

Maximum Points: 100

Course Name: Risk & Value Management

Semester: II

Notes:

15/7/26

1. Q.1 is a compulsory and solve any four out of remaining six
2. Illustrate answer with neat sketches wherever required.
3. Make suitable assumptions where necessary and state them clearly.

Q.No.	Questions	Points	BL	CO	Module
1	Solve any four: A. Causes of risk in construction projects. B. Objectives of Risk Identification. C. Importance of risk analysis. D. Risk Evaluation and its advantages. E. Benefits of value analysis.	20	1,2	1-4	1-7
2	A. Define risk and risk management. Discuss the various types of construction risks in detail with suitable examples. B. Risk Vs Uncertainty. C. Write a short note on: Risk Utility.	10+05 +05	1,2	1-3	2,3
3	A. Define risk identification. Discuss the various tools and techniques used for risk identification in construction projects. B. Define: Risk Register. Make a list of components of risk register.	10+05 +05	1,2	1-3	1-3
	C. Compare qualitative risk analysis and quantitative risk analysis in construction projects.				
4	A. What do you mean by risk monitoring? Discuss the key activities involved in risk monitoring. B. Define: Risk adjusted discount rate (RADR). A Contractor plans to construct a mid-rise apartment building project with the following details: (Initial investment = ₹90 lakh, Expected annual net cash inflow = ₹32 lakh, Project life = 6 years, Risk-free interest rate = 7%, Risk premium for real estate projects = 5%, Using the Risk-Adjusted Discount Rate (RADR) method, calculate:	10+05 +05	1,2	1-3	2,3



	1. Risk-adjusted discount rate 2. Present value of cash inflows 3. Net Present Value (NPV) 4. Whether the project should be accepted or rejected C. A residential building project is experiencing delays due to the following reasons: • Poor planning • Labor shortage • Unexpected rainfall • Increase in material cost Based on the above case, answer the following questions: • Identify any four risks involved in the project. • Suggest suitable risk response strategies for each identified risk. • Recommend preventive measures to reduce the impact of these risks.				
5	A. Describe the important areas of risk control in construction projects with relevant examples. B. Define: Risk residual. Discuss the importance of assessment of residual risk in construction projects. C. General Liability Insurance Vs Wrap up liability insurance.	10+05 +05	1	1-3	3,4
6	A. Define: Value Engineering. Discuss the types of values in value engineering with examples. B. Value Analysis vs Value Engineering. A. Write a short note on : Advantages of Value Management in construction projects.	10+05 +05	2	4	5,6
7	A. What do you mean by Value Management? Explain the techniques and tools used in value management. B. Make a list of criteria's used to determine value of product. C. Explain the importance stakeholders in value management studies.	10+05 +05	1,2	4	7