Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W) Mumbai – 400058

END SEM/ RE EXAM EXAMINATION -MAY / JUNE 2025

Program: M Tech Civil Engg / Structural Engg **Duration: 3 hours**

Course Code: OE MTCM MTSE 202 **Maximum Points: 100**

Course Name: Legal Aspects in Construction **Semester: II**

Notes:

Q.No.	Questions	Points	CO	BL	Module No.
Q.1	1 As per Section 62 of the Indian Contract Act, additions or alterations to the contract can be made: a. Unilaterally by any party b. The contract cannot be changed c. Only by the consent of both parties to the contract 2. 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 3. An Arbitration clause in a Contract is a a. Terms of contract b. Conditions of contract c. Directions of the work d. Provision in the Contract 4. In the 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%	20	2,3,4,7	3	2,3,4,7

END SEM/ RE EXAM EXAMINATION -MAY / JUNE 2025

5. 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
6. Acceptance of an offer with additional terms in the work order is said to be:
   a. Counteroffer
   b. Absolute Acceptance
   c. Rejection of an offer.
7. Sections 73,74,75 of the Indian Contract Act 1872 deal with
   a. Provisions in the contract
   b. Additions and Alterations in the contract
   c. Consequences of Breach of Contract
8. Before any change is made in a Contract, notice is mandatory
   a) True b) False
9. An Award passed by an Arbitrator can be challenged in the Court
   a) True b) False
10. Agreement to execute an impossible work/ task is void
    a) True b) False
11. Only retired judges can act as arbitrators
    a) True b) False
12. **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

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	13. Variation in quantity can be to any extent, and the contractor cannot ask for revision in rates. a) True b) False 14. The contractor is not bound to carry out extra items if the rates are not finalised. a) True b) False 15. In absence of an arbitration clause in the contract, one party can still insist on arbitration. a) True b) False 16. The contract cannot be altered unilaterally. a) True b) False 17. It is not mandatory to issue a notice for changes in the contract. a) True b) False 18. The conciliation process is not final and binding on the parties. a) True b) False 19. Should the contract administrator have only technical knowledge? a) True b) False 20. There is no special act in India for engineering contracts. a) True b) False				
Q 2	a. Write a note on Void and Voidable Contract b Define Delays and Types of delays, along with examples	20	3	2	3
Q 3	a. Enlist Claims in the Construction contract and explain any two b. Enlist the Rules of Interpretation of Contract and explain any one	20	4	1	4

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END SEM/ RE EXAM EXAMINATION -MAY / JUNE 2025

Q 4	Write notes on Types of Alternative Dispute Resolution	20	4	1	4
Q 5	What is FIDIC with relevant coding, and explain the advantages and disadvantages	20	7	4	7
Q 6	Write Short notes on a. Privity of Contract b. Quantum Meruit c. Notice d. Extra Item, Additional Item, Variation	20	7	2	7
Q. 7	Write Short notes on a. Note on Industrial Dispute Act b. Note on Workmen's Compensation Act c. Note on Minimum Wages Act d. Note on Employers' Liability	20	5,6	1	5,6

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Program: M Tech Civil Engg / Structural Engg Sem II **Duration: 3 hours**

Course Code: OE MTCM MTSE 202 **Maximum Points: 100**

Course Name: Legal Aspects in Construction **Semester: II**

Notes:

23/6/25

Q.No.	Questions	Points	CO	BL	Module No.
Q.1 A	1. On termination of a contract, the contractor can claim for _____ a. Opportunity lost b. Damages for reputation c. Loss of profit on balance work 2. When both 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 3. Variations, Extras and Change Order are all the same in Engineering Contracts. a) True b) False 4. For interpretation of a clause in the contract, the Trade practice needs to be considered as the rule under_____ a. Contra proferentem b. Contract Administration c. Implied terms of contract d. None of the above	10	2,3,4,7	3	2,3,4,7

END SEM/ RE-EXAM EXAMINATION -MAY / JUNE 2025

	5. An arbitration award can be challenged under Section _____ of the Arbitration and Conciliation Act 1996 a Section 22 b. Section 34 c. Section 45 6. Conciliation process for dispute resolution mechanisms is mandatory as per Law a) True b) False 7. If there is no limit on variation in quantity in a Contract, the contractor is bound to carry out any amount of quantity under the Law. a) True b) False 8. If a party to a contract has the right to demand or select a particular situation but it does not exercise the right, it is termed as: a. Selection b. Estoppel c. Waiver d. Force majeure 9. The Claims in litigation need to be proved based on the facts, contract, law, and trade practice altogether. a) True b) False 10. Arbitral Tribunal can appoint experts to assist them. a) True b) False				
Q 1 B	Write a Note on the process and procedures in Arbitration	10	4	3	4

~~END SEM~~/ RE-EXAM EXAMINATION -~~MAY~~ / JUNE 2025

Q 2	a. Explain: All Contracts are agreements, but not all agreements are contracts. b. Define Delays and Types of delays, along with examples	20	3	2	3
Q 3	a. Explain the bid cycle. b. Enlist the Rules of Interpretation of Contract and explain any one	20	4	1	4
Q 4	Explain in brief the various types of contract	20	4	1	4
Q 5	a. What is FIDIC and explain the advantages and disadvantages b. Explain the grounds for setting aside the Arbitration Award (Sec 34)	20	7	4	7
Q 6	Write Short notes on a. Waiver b. Estoppel c. Notice d. Extra Item, Additional Item, Variation	20	7	2	7
Q. 7	Write Short notes on a. Requirement of Valid Contract b. Note on Workmen's Compensation Act c. Contract Administrator Role d. Note on Employers' Liability	20	5,6	1	5,6

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END SEM/[redacted]M. EXAMINATION MAY/[redacted] 2024-25

Program: M.Tech. Civil Engineering (PG) with Emb AI **Duration: 03 Hrs.**

Course Code: OE-MTCM206/MTSE203 **Maximum Points: 100**

Course Name: Artificial Intelligence in Engineering **Semester: II**

14/3/25

Notes:

- 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**.

Q. No.	Questions	Points	CO	BL	Module
1	(a)Explain soft computing and hard computing. State capabilities of each technique in computing.	10	1	2	1
	(b)What are the examples of artificial intelligence (AI)? Discuss various applications of artificial intelligence (AI).	10	2	3	1
2	(a)What is fuzzy logic in natural language processing (NLP)? How fuzzy logic is used in real life?	10	2	3	2
	(b) What is the difference between fuzzy logic and probability? Explain the concepts of fuzzy sets.	10	2	3	2
3	(a)What is neural network and its function? Explain types of ANN.	10	2	2	3
	(b) Write short notes on: (i) Activation Function in ANN; (ii)Supervised vs. Unsupervised learning	05 05	2	4	3
4	(a)Explain the concept of evolutionary algorithms and discuss Genetic algorithm (GA) and GA operators.	10	2	4	4
	(b) Explain the role of Fitness function and Crossover techniques in GA.	10	2	3	4
5	(a) Write short notes on: (i)Genetic Programming (GP) and its applications (ii) Model Tree (MT)	05 05	2	4	4

	(b) What is Data mining? Does learning imply intention? Discuss and Explain Classification vs. association rules.	10	2	4	4
6	(a)What do mean by Sparse data, missing values, unbalanced data and output as a Knowledge representation? Explain with an example.	10	2	4	5
	(b) Explain the concept of hybrid system, concept of hybrid system and its significance in general to engineering applications.	10	2	4	5
7	Write short notes on the following:				
	(i) Neural network Architecture	05	2	3	3
	(ii) Linguistic variables in Fuzzy Logic	05	2	3	2
	(iii) Perceptron learning rule	05	2	3	3
	(iv) The function set and terminal set in GP	05	2	4	4

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End Semester 2025 Examinations

SET A

Program: M Tech Civil with Construction Mgt / Str. Engg.
Course Code: AE MTSE 201-202
Course Name: **English For Research Paper Writing**

Duration: **03 hours**
Maximum Points: **100**
Semester: **II**

Note:

- **Total Seven Questions**
- **Question 01 is Compulsory**
- **Out of remaining 06 questions attempt any four**

Sr.No	Questions	Points	CO	BL	Module
Q.1.	**Briefly Explain ant two from the following:** 1. Evaluation Criteria for Group Discussion 2. Explain why an abstract should be Concise, Clear and Self-Contained. What common mistakes should be avoided while writing an abstract? 3. Difference between editing and Proof reading 4. Define technical report. How is technical report writing different from Academic writing	20	01, 2,3, 4,5	02	01,
Q.2. A	Explain the MAP (Message-Audience-Purpose) framework in academic writing. Provide a paragraph of your own and identify the MAP elements within it.	10	01	L2	01
Q.2. B	Rewrite the following sentences to reflect academic tone with clarity, objectivity, and precision. Explain your changes. Given Sentences a) I think the results are quite good. b) We did this study to check what happens. c) A lot of scientists believe this is important. d) This paper talks about solar panels. e) Our results were very surprising!	10	02	L3	04
Q.3.A	Explain the purpose of the following types of reports based on audience.	10	3	L1	03

	Then explain their structure. a) Memo Report b) Letter Report c) Project Report d) Survey-Based Report				
Q.3.B.	Explain how academic proposals differ from technical proposals. Write a short academic proposal outline on the topic: "Reducing Plastic Waste in Academic Campuses."	10	4	L3	03
Q.3.B.	Prepare the SWOT analysis of the branch and institute that you are currently studying	10	4	L4	06
Q.4. A.	Write a detailed report for any one of the following situations: 1. You are the chairperson of the maintenance department of Sardar Patel College of Engineering You are instructed to prepare a report on feasibility of making a boys and girls hostel for SPCE undergraduate and post graduate students with a capacity of 1800 students on the campus along with your recommendations. Write the report in Memo format Note: Mention all the contents in sequence and an outline of points and sub-points of your report as taught in class.	20	1	L6	03
Q.5.A	Describe the process of reading and analyzing a primary research article. Include how to skim, scan, and critically evaluate the content.	10	2	L4	02
Q.5. B	Explain the Interview process in detail. Describe the different types of interviews a candidate has to face.	10	4	L1	06
Q.6.A	Here is a first- hand account of a very good public speaker who trains professionals in public speaking. I train business professionals in public speaking and also in preparing their project proposals and presentations. One day, my friend Mohan called and asked if I could help his boss, Mr. Andrew's who had to speak at the convocation ceremony of an engineering institute in Mumbai. I asked if his boss knew what he wanted to say, and Mohan said yes, but the talk was not developed yet and his boss wouldn't have time to devote to it until the weekend. I learnt from Mohan that Mr. Andrews was really smart but not experienced in speaking to large groups. We set up two meetings with Mr. Andrews- the first to discuss what the	15	5	L3	05

message would be; the second to practice it. I asked for a general summary of what would be said. Mohan replied, 'He is going to say something about today's job market for Engineering graduates due to the impact of pandemic and about its future as well. I was expecting to be briefed by Mohan on the content of his talk.

When I walked for the meeting, the receptionist escorted me into a meeting room off the lobby. Mohan too arrived, handed me his business card, and briefed me on the status of the scripts and slides (a work in progress). Shortly, Mr. Andrews arrived with a handful of wrinkled papers in his hand. They were his notes. He did not know how to connect his computer to the projector, or how to use power point well enough to re-sequencing the slides and add appropriate designs, insert tables and animate the slides where needed. However, his knowledge of contemporary job market was encyclopedic and the rate at which he spoke was supersonic. When I asked questions about his topic so that he could clarify what he wanted to say, and in what order, he was wonderfully patient with my modest understanding of his discipline, and used analogies and metaphors to explain his point-a sign, I think, of a good communicator.

In addition to speaking very fast he did not look me in the eye, and also did not relate what he said to the bar charts on the screen. But he spoke with visceral passion and emphatic verve about the way multinational companies are working these days – and that made up for his other flaws as a speaker. He could lift up his whole body and jump into a keyword with both feet-giving it real meaning and significance.

The challenge, however, was to develop his topic so that the audience would think they were hearing a standard talk about globalization and job markets for fresher's in particular and further developing to talk to strategies to get placed in good companies.

After two meetings, we cut the slides down to 40 and the timing down to One hour. He had no time to rehearse. He promised he would work on it in his hotel room when he arrived in Mumbai. I continued to email him suggestions over the weekend.

I learned from Andrews that he did not rehearse until he was on the plane, and then he stayed up most of the night in a panic working on it. Two days after the event, he called to say it went well, and that me emails helped. I called Mohan to get his assessment, who said it was a little short- much shorter than the presentations made by other speakers. I pointed out that short presentations are not a bad thing-'For a speech to be immortal, it not be interminable'.

The points Andrews needed to remember were as follows:

1. Get attention of his audience
2. Sustain the attention
3. Make a clear point in a memorable way
4. Be unique in his own way

	5. Persuade people to come to talk to him His job was to generate trust and curiosity among his audience and sustain their interest in his convocation address. **Questions:** 1. 'Mr. Andrews had not adequately planned and prepared his presentation'. Do you agree or disagree with this statement? Explain in detail the steps that Mr. Andrews needs to work on for planning the presentation. **10** 2. What are the factors that Mr. Andrews need to keep in mind regarding the designing of his power point slides his body language, time and word budgeting during presentation. **05**				
Q.6.B	Prepare an Introduction to Mr. Andrews's presentation keeping the Delivering effective presentations syllabus topic in mind.	05	5	L2	05
Q.7.A	**In response to the advertisement below prepare a 1. Cover Letter and Curriculum Vitae. Exciting Career Opportunity for Core Branch Engineers** **Company:** Larsen & Toubro (L&T) **Position:** Senior Engineer Core Engineering Roles **Eligible Branches:** Civil, Mechanical, Electrical **Eligible Students:** M tech (Batch of 2026) **Location:** Pan-India Project Sites & Offices **What We Offer:** Hands-on training on real-world mega projects Opportunity to work with industry experts Career growth in core engineering fields Competitive compensation and benefits **Eligibility Criteria:** • Currently pursuing MTech in Civil, Mechanical, or Electrical Engineering • Minimum 60% aggregate across academics (B.Tech semesters till date) • Strong technical fundamentals and aptitude for fieldwork Excellent communication and teamwork skills	20	4	L6	07

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END SEM/~~RE-EXAM~~ EXAMINATION -MAY / JUNE 2025

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	4	3	2
	5.2 List out ten steps, in sequence, for the preparation of Civil Structural, Architectural Tender specification.	10	4	2	2
6	6.1 How is stability and horizontal load transfer achieved in a steel frame structure? Is there an advantage in using higher strength steels to control deflection or vibration? Explain.	10	3	4	3
	6.2 Explain the different stages at which BIM is used in Construction projects. What are the advantages of BIM in construction?	10	3	3	4
7	7.1 Explain with seven factors why a plot layout/plan is important.	10	4	2	5
	7.2 Explain any five top emerging trends which are impacting the Construction industry today.	10	4	3	5
	End of Question Paper				

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END SEM/~~RE-EXAM~~ EXAMINATION -MAY / JUNE 2025

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.
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 What is value to different stakeholders? Give examples of how projects create value. Explain Value delivery system.	10	1	3	3
	2.2 Explain the three Project delivery approaches and the change in approach towards Project Management in the current PMI Standard. Briefly define project management principles, listing any six PM principles.	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

I

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END SEM/RE-EXAM EXAMINATION -MAY / ~~JUNE~~ 2025

Program: M. Tech. Construction Management Sem II Duration: 3 hr

Course code: PC-MTCM-201 Maximum Points: 100

Name of the Course: Project Monitoring and Control Semester: II

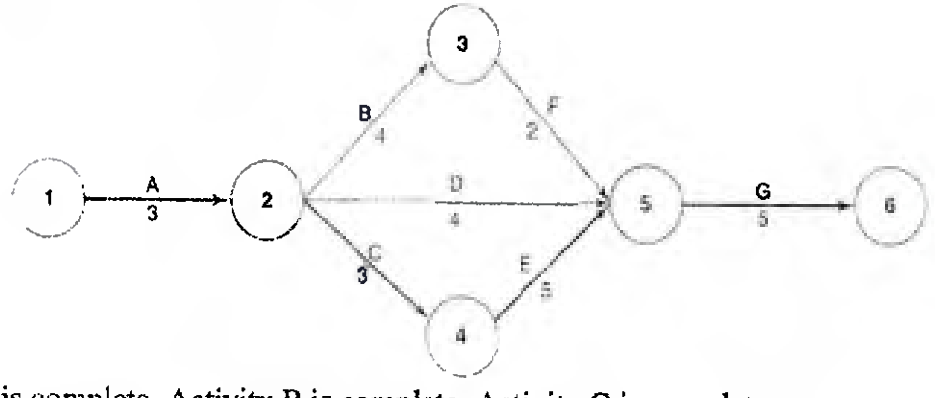
20/5/25

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

Q. No.	Questions	Points	CO	BL	Module
1 a	Your project is currently at the halfway point. According to the original schedule, 60% of the work should have been completed, but only 45% is actually finished.	8		BL3	4
	The budgeted cost for the work completed is ₹50 lakh, but the actual cost incurred is ₹60 lakh. Calculate the Schedule Variance (SV) and Cost Variance (CV). What do these variances indicate about the project's status?				
1b	During a site inspection, you notice that the concrete work is not being done according to the specified quality standards.	8		BL3	6
	What steps would you take to address this issue as part of project control?				
1c	Differentiate between Quality Control and Quality assurance with the example of RMC to be used for high-rise building construction project.	4		BL3	6
2	A contract is awarded to you for the construction of high-rise building project in a metro city Mumbai.				
2 a	List the records to be maintained on the site for project monitoring and control	5	CO3	BL2	2
2 b	Discuss the quality control and safety plan for the high-rise building project in a metro city Mumbai.	5	CO2	BL3	6
2 c	Discuss the hazard involved in the construction of high-rise building project in a metro city Mumbai and mitigation measures.	5	CO2	BL3	6
2 d	Comment about how integrated approach helps in the construction of high-rise building project in a metro city Mumbai.	5	CO1	BL3	7
3 a	A.s per the report of March 2024 published by Govt. of India, MOSPI in the context of construction of various projects.	9	CO3	BL2	3
	a) Discuss the reason for time overrun. b) Causes of cost escalation. c) Action taken by the government to minimise time and cost overruns in the project.				

3 b	Prepare a checklist for the construction project for the excavation activity.	4	CO3	BL2	6
3 c	You are managing a project with a tight deadline. You observe that one of the critical path activities is facing a potential delay due to a shortage of skilled labor. What proactive measures could you have taken to mitigate this risk? What reactive measures could you consider now?	7	CO1	BL2	2
4 a	Discuss about construction project process group their integration points and corresponding documents required at that process stage.	8	CO3	BL3	1,7
4 b	Discuss the utility of lean construction in highway construction project.	6	CO2	BL3	4
4 c	Discuss the safety precautions to be taken during the use of overhead crane in case of high-rise building construction project.	6	CO2	BL2	6
5 a	You are appointed as a project management consultant for the National Highway construction project, discuss project from planning context so that successful delivery of project is possible.	10	CO1	BL2	2,3,4
5 b	During the National Highway construction project monitoring following observations are recorded: The labours and equipments are not delivering upto the expectations. Discuss precautionary measures to be taken to handle this issue.	10	CO1	BL3	2
6 a	Discuss the need of scope management in the construction of for flyover construction project with emphasis on scope planning, detailing, scope monitoring & control along with scope verification.	10	CO1	BL2	1
6 b	It is proposed to update the project after 15 days	10	CO1	BL4	2



Activity A is complete. Activity B is complete. Activity C is complete.
Activity D will take 3 more days to finish. Activity E still needs 4 days to complete.
Activity F is underway and will take another day to complete.
Duration of activity G has been revised to 8 days.
Find critical path and project duration. Draw updated network.

7 a	Discuss various phases of Quality throughout the project life cycle.	7	CO2	BL3	6
7 b	What are the quality characteristics of QC inspector?	5	CO2	BL2	6
7 c	Define method statement and various types of method statements. Discuss its utility for project execution	8	CO3	BL2	1,7

II

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[redacted]/RE-EXAM EXAMINATION -[redacted] / JUNE 2025

Program: M. Tech. Construction Management Duration: 3 hr

Course code: PC-MTCM-201 Maximum Points: 100

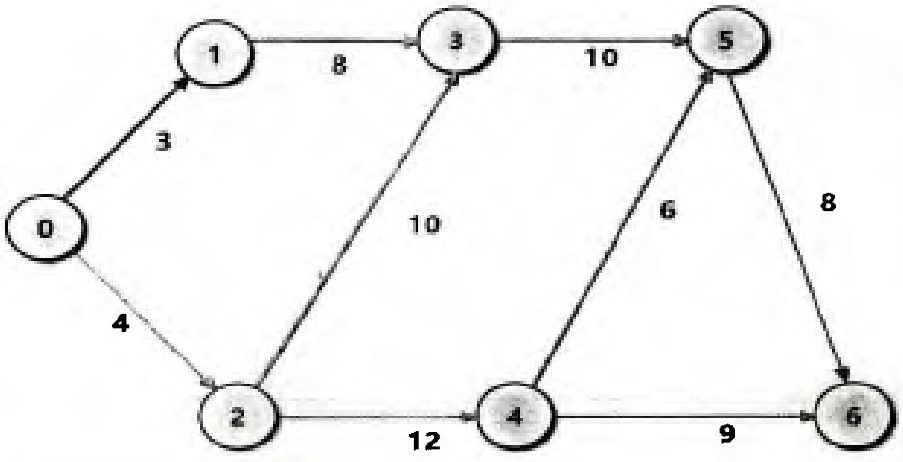
Name of the Course: Project Monitoring and Control Semester: II

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

25/6/25

Q. No.	Questions	Points	CO	BL	Module
1 a	During a site inspection, you noticed that the safety is not being followed as per specified safety protocols.	8	CO3	**BL2**	**6**
	What steps would you take to address this issue as part of project control?				
1 b	You are preparing a monthly progress report for stakeholders.	8	CO1	**BL2**	**5**
	What key information should you include in this report to effectively communicate the project's status?				
1 c	Discuss the consequences of time and cost overrun in case of highway construction project.	4	CO1	BL2	3,4
2	A contract is awarded to you for the construction of fly over construction project in a metro city Mumbai.				
2 a	List the records to be maintained on the site for project monitoring and control.	**5**	CO3	BL2	**2**
2 b	Discuss the quality control and safety plan for fly over construction project in a metro city Mumbai.	**5**	CO2	BL3	**6**
2 c	Discuss the hazard involved in the construction of fly over construction project in a metro city Mumbai and mitigation measures.	**5**	CO2	BL3	**6**
2 d	Comment about how integrated approach helps in the fly over construction project in a metro city Mumbai.	**5**	CO1	BL3	**7**
3 a	Highlight the importance of Work instructions and checklist in construction project? Prepare checklist for a) Brick work b) Form work for concreting	10	CO1	BL2	6,7
3 b	NHAI faces challenges in the context of construction of highway projects.	10	CO1 CO2	BL2	2,3
	Discuss the reason for time overrun. Causes of cost escalation. Action taken by NHAI minimize time and cost overruns in the project.				
4 a	It is proposed to prepare a method statement for pile foundation and discuss the typical contents of method	10	CO3	BL3	1

	statements for pile foundation work. Also highlight its utility for construction monitoring and execution.				
4 b	Update the network and find the critical path.	10	CO2	BL3	2
	 A review of the project after 20 days reveals that a) Activities 0-1, 0-2 and 1-3 are completed. b) Activity 2-3 is in progress and will take 7 days more. c) Activity 2-4 is in progress and will take9 days more. d) Also it is estimated that due to the arrival of a new machine, activity 3-5 will take only 7days				
5(a)	Discuss the process of project risk monitoring and control.	10	CO1	BL3	7
5(b)	Define lean construction and discuss how it is useful during construction project execution? Brief about different types of waste in Highway construction project.	10	CO1	BL2	4
6 (a)	Discuss the impact of poor quality on project cost and schedule.	8	CO2	BL2	6
6 b	Compare Quality Assurance and Quality Control?	6	CO2	BL2	6
6c	Discuss the roles and responsibilities of various stakeholders during the change control process.	6	CO1	BL2	1
7 (a)	Explain the term updating along with need of updating. Brief about the data required for updating process along with flowchart for updating.	10	CO1	BL2	2
7(b)	Discuss the frequency of test for quality control during highway construction. a) Earthwork b) Gravel sub-base c) Lime soil d) WBM e) Bituminous macadam f) Surface dressing & premix carpet g) Asphaltic concrete h) Cement concrete pavement Brief about how to address poor quality issues.	10	CO1	BL3	2,6

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END SEM/~~RE-EXAM~~ EXAMINATION -MAY / ~~JUNE~~ 2025

M.Tech Constn. Engg. Mgt. Sem II

Total points: 100

Duration: *Total Time allotted will be 3Hr.*

Class: M.TECH(CM). Semester: II Program: Civil

Name of the Course: **Project Appraisal, Planning and Scheduling** Course Code : **PC- MTCM202**

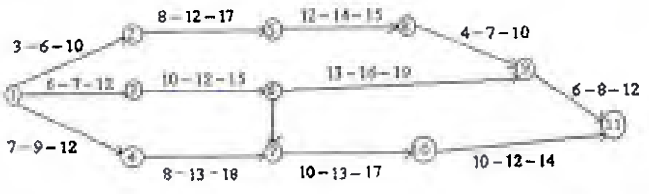
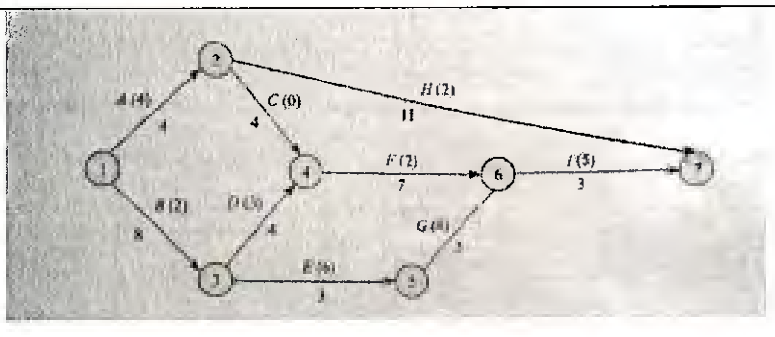
Instructions:

1. Assume suitable data if necessary and state the clearly.

21/5/25

Que. No		Points	CO	BL	Module No
1	A. Determines all types of floats and critical Path using information given in above table.	10	1	3	4
	B. Give significance of following- a. Direct Cost b. Indirect cost c. Total cost d. Normal duration e. Crash Duration f. Crash Slope	10	2	2	5
2	A. Given that the process of project selection involves stages such as idea generation, scouting for project ideas, preliminary screening, project rating index, and entrepreneur qualities, what would happen if	10	1,2	2	6

Activity	Duration
1-2	8
1-3	10
1-4	5
2-7	6
3-4	3
4-5	7
4-7	0
5-6	4
5-7	3
5-8	6
6-8	5
7-8	5

	the project rating index was skipped? How might this affect the quality of the final project selection? B. Discuss the importance of each type of analysis (economic, financial, market, technical, managerial competence, and ecological) in the appraisal of a proposed project. How do these analyses contribute to making informed decisions, and why is it crucial to consider all of them before proceeding with a project.	10	1,2	2	1
3	 A. Calculate the variance and the expected time for each activity using above network. B. Prepare A Phase-Based Work Breakdown Structure for construction project of G+16 floors.	10 10	2 2	3 2	4 2
4	A. Short notes on followings- 1. Sequence of Activities. 2. Methods to determine activity durations. 3. Types of budgets. 4. Time cost trade-off in construction projects	20	2,3	2	2,6
5	 A. Level the resources so that project don't consume more than 7 at a time.	10	1,2	2	5

<table>
<tr><td></td><td>B. What is resource smoothing in project management, and how does it differ from resource leveling? Provide an example to illustrate your answer.</td><td>10</td><td>1</td><td>2</td><td>5</td></tr>
<tr><td>6</td><td>A. Why provisions of inflation and contigiencies are important in constrcution project.Illustatae with example.
B. How can AR and VR contribute to sustainable construction practices?</td><td>10
10</td><td>1,2
1,2</td><td>2
2</td><td>7
7</td></tr>
<tr><td>7</td><td>Determine the minimum cost and optimum duration for the project network .Indirect cost= Rs. 80/day. Use graph paper.
<table>
<tr><th>Activity</th><th>Normal duration</th><th>Crash duration</th><th>Normal cost</th><th>Crash cost</th></tr>
<tr><td>1-2</td><td>2</td><td>2</td><td>1000</td><td>1000</td></tr>
<tr><td>1-3</td><td>7</td><td>3</td><td>500</td><td>900</td></tr>
<tr><td>2-3</td><td>6</td><td>3</td><td>300</td><td>420</td></tr>
<tr><td>2-4</td><td>5</td><td>4</td><td>200</td><td>250</td></tr>
<tr><td>3-4</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>3-5</td><td>9</td><td>4</td><td>600</td><td>900</td></tr>
<tr><td>4-6</td><td>11</td><td>6</td><td>600</td><td>1000</td></tr>
<tr><td>5-6</td><td>6</td><td>3</td><td>700</td><td>910</td></tr>
</table></td><td>20</td><td>2</td><td>3</td><td>5</td></tr>
</table>

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Sardar Patel College of Engineering

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~~END SEM~~/RE-EXAM EXAMINATION ~~MAY~~ / JUNE 2025

M.Tech Const. mgt Sem II

Total points: 100

Duration: *Total Time allotted will be 3Hr.*

Class: M.TECH(CM). Semester: II Program: Civil

Name of the Course: **Project Appraisal, Planning and Scheduling** Course Code : **PC- MTCM202**

Instructions:

26/6/25

1. **Solve any five questions out of seven**
2. Assume suitable data if necessary and state the clearly.

Que. No		Points	CO	BL	Module no
1	A. You are managing the construction of a building that requires a series of repetitive tasks. The activities involved include foundation work, structural work, and finishing work. These tasks need to be performed in a specific sequence, with each phase repeating across different sections of the building. Your goal is to determine the Line of Balance (LOB) for a set of activities and balance them to ensure the project remains on schedule. You are given the following information: 1. Foundation Work: Takes 10 days for each section. 2. Structural Work: Takes 15 days for each section. 3. Finishing Work: Takes 8 days for each section. Each section of the building requires these three tasks in sequence, and there are a total of 5 sections to complete. Using this information: • How would you use the LOB method to ensure each activity is completed on time, without delays stacking up across sections? • What would the graphical representation of the LOB look like for these activities (time vs. section completion)? • If the structural work in Section 3 is delayed by 5	10	1	2	2

days, how would this impact the completion of the project and what adjustments can be made to keep the schedule balanced?

B. Draw network, Estimate all types of floats.

		10	3	3	3

Activity	Description	Duration	Predecessors
A	Site clearing	3	---
B	Excavation	4	A
C	Foundation	5	B
D	Columns	4	C
E	Slab	6	C
F	Walls	5	D,E
G	Roof	3	F
H	Plumbing	4	E
I	Electrical	4	E
J	Finishing	5	G,H,I

2	A. Discuss the key characteristics of a project. How do these characteristics differentiate a project from routine operations? Explain how understanding these characteristics can contribute to successful project management.	10	1	1	6
	B. Given that the process of project selection involves stages such as idea generation, scouting for project ideas, preliminary screening, project rating index, and entrepreneur qualities, what would happen if the preliminary screening stage were skipped? How might this affect the quality of the final project selection?"	10	2	1	1

3

Activity	Most optimistic time	Most pessimistic time	Most likely time
1-2	1	5	1.5
2-3	1	3	2
2-4	1	5	3
3-5	3	5	4
4-5	2	4	3
4-6	3	7	5
5-7	4	6	5
6-7	6	8	7
7-8	2	6	4

	7-9	5	8	6			
	8-10	1	3	2			
	9-10	3	7	5			
	A. Construct a PERT network. Find the critical path and variance for each event.				15	2	2	3
	B. Enlist differences between resource smoothening and resource levelling.				05	2	2	4
4	A. Explain the key steps involved in the planning process in management. Why is each step important for effective planning?				10	2	1	5
	B. Different agencies are involved at various stages of planning in a country. Identify and explain the major stages of planning and discuss the role played by different agencies at each stage.				10	2	2	6
5					10	3	2	3

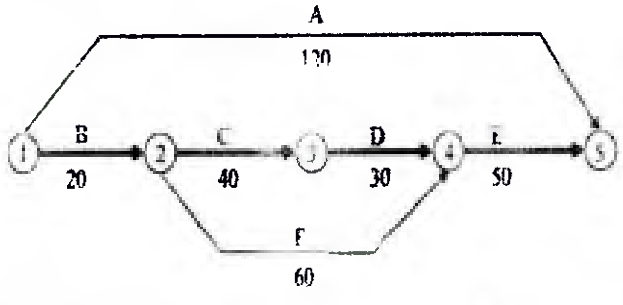
Activity	Duration	Predecessor Activity	Labors/week
A	3	--	9
B	5	--	6
C	1	--	4
D	1	A	10
E	7	B	16
F	6	B	9
G	4	C	5
H	3	C	8
I	6	D, E	2
J	4	F, G	3
K	3	H	7

A. The activities involved in the construction of a small project are given in above Table. The resource usage for each activity is shown in above Table. Smooth the resource so that a preferred resource usage is obtained.

B. Level the resources so that project doesn't consume more than 6 labors at any time. 10 1,3 3 4

Activity	Duration	Predecessor Activity	Labors/week
A	5	--	2
B	7	--	4
C	3	A	3

	D	5	A, B	3		
	E	2	C, D	2		
6.	A. How can AR improve the accuracy and efficiency of on-site inspections? Explain in detail. B. List and explain three key applications of VR in the planning and design phase of construction and safety trainings.	10 10	2,3 1,2	2 2	7 7
7	The network and durations given below shows the normal schedule for a project. You can decrease (crash) the durations at an additional expense. The Table given below summarizes the time-cost information for the activities. The owner wants you to you to finish the project in 110 days. Find the minimum possible cost for the project if you want to finish it on 110 days. (Assume that for each activity there is a single linear, continuous function between the crash duration and normal duration points). Use graph paper.	20	2,3	3	5



Activity	Normal duration (days)	Crash Duration (days)	Normal Cost	Crash Cost
A	120	100	12000	14000
B	20	15	1800	2800
C	40	30	16000	22000
D	30	20	1400	2000
E	50	40	3600	4800
F	60	45	13500	18000

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END SEM/~~RE-EXA~~M EXAMINATION -MAY / ~~JUNE~~ 2025

M. Tech Civil with Const. Mgt. Sem II

Total points: 100

Duration: *Total Time allotted will be 3Hr.*

Class: M.TECH(CM). Semester: II Program: Civil

Name of the Course: **Risk and Value Management** Course Code : **PE-MTCM201**

Instructions:

1. Assume suitable data if necessary and state the clearly.

26/3/25

Que. No		Points	CO	BL	Module no
1	A. A project requires an initial investment of $25,000. It is expected to generate the following cash inflows: Year 1: 8000; Year 2: 10000; Year 3: 12000; Year 4: 14000; Year 5: 10000 Calculate the Payback Period. B. A company is considering a project that requires an initial investment of $60,000. The project will generate the following cash inflows over the next 4 years: Year 1: 18000; Year 2: 20000; Year 3: 25000; Year 4: 22000 The discount rate is 12%. Calculate the Net Present Value (NPV) of the project and decide whether it should be accepted. C. A project requires an initial investment of $80,000 and is expected to generate the following	20	2,3	2	1

cash inflows over 4 years:

Year	Cash flows
1	20000
2	25000
3	30000
4	35000

The discount rate is 10%. Calculate the Net Benefit-Cost Ratio (BCR) and determine if the project should be accepted.

D. A project requires an initial investment of $50,000 and generates the following cash inflows over 4 years:

Year	Cash flows
1	15000
2	15000
3	20000
4	10000

Calculate the Internal Rate of Return (IRR) for the project.

2		N1	N2	N3	N4	10	1	2,3	2
	A1	50	25	-25	-45				
	A2	70	30	-40	-80				
	A3	30	15	-1	-10				
	A. Above is payoff matrix, Decide the suitable strategies using following criteria's- 1. Laplace criterion 2. Criterion of optimism 3. Criterion for pessimism 4. Minimax regret criterion 5. Hurwicz criterion								
	B. Describe the major reasons for consumption of energy in buildings					10	2	2	7
3	What are the main mitigation strategies for negative risks (threats) in project management, and how does each approach help reduce the impact of such risks?					20	2	3	3
4	A. Write note on Contractors Plant and Machinery Insurance Policy with its advantages.					10	1	2	4
	B. Discuss conditions under which policy for Machinery breakdown insurance/ Loss of					10	2	3	4

	Performance of construction equipment is applicable.				
5	A.Define and differentiate between Use Value, Esteem Value, Exchange Value, and Cost Value in project or product evaluation. How do these values influence decision-making during value analysis or value engineering processes?	10	3	2	5
	B.Explain the key factors that contribute to the overall value of a product or project—Aesthetic, Ergonomic, Technical, and Economic—and discuss how each factor influences user satisfaction and decision-making in value analysis.	10	3	1,2	5
6	A. Why is it important that members of a Value Analysis Team (VAT) should not have participated in the original design of a project, and what role should the original designer play during a value engineering study?	10	1	1,2	6
	B. Discuss the key considerations in staffing and structuring a Value Analysis (VA) team. Why is it important to have a multidisciplinary team, and how does team composition impact the effectiveness of a VA study?	10	2	3	6
7	A client ask estate agent to sell 3 properties A, Band C for him and agrees to pay him 5% Commission on each sale. he specifies certain conditions. The estate agent must sell property A first and this he must do within 60 days. If and when A is sold the agent receives his 5% Commission on that sale. He can then either back out at this stage or nominate and try to sell one other remaining 2 properties within 60 days. if he does not succeed in selling the nominated property in that period he is not given the opportunity to sell the other. If he does send it in the period he is given the opportunity to sell the 3rd property on the same conditions. the following table summarises the prices , selling cost (incurred by the estate agent whenever a sale is made) and the estate agents estimated probability of making a sale.	20	4	1,2,3	2

Property	Price of property	Selling costs	Probability of sale
A	12000	400	0.7
B	25000	225	0.6
C	5000	450	0.5

	A. draw up an appropriate decision tree for the estate agent B. what is the estate agents best strategy under EMV(expected monetary value) approach?				

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~~END-SEM~~/RE-EXAM EXAMINATION -~~MAY~~/ JUNE 2025

M.Tech Civil with Const Mgt. Sem II 27/6/25

Total points: 100

Duration: *Total Time allotted will be 3Hr.*

Class: M. TECH(CM). Semester: II Program: Civil

Name of the Course: **Risk and Value Management** Course Code: **PE-MTCM201**

Instructions:

1. Assume suitable data if necessary and state the clearly.

Que. No		Points	CO	BL	Module no
1	A. Calculate Net benefit-cost ratio of a project with following details Initial Investment= Rs 1000000, cost of capital=12%	20	2,3	3	1

Benefits	Investment
Year 1	25000
Year 2	40000
Year 3	40000
Year 4	50000

B. Calculate Internal Rate of Return (IRR) with discount rate = 15%

Year	Cash Flow
0	1000000
1	30000
2	30000
3	40000
4	45000

C. A company is considering an investment project that requires an initial outlay of $50,000. The project is expected to generate the following cash flows over 5 years:

Year	Cash flows
1	10000
2	12000
3	15000
4	13000

	5 | 10000 The discount rate is 10%. Calculate the Net Present Value (NPV) of the project. D. A company invests $40,000 in a project. The project is expected to generate the following annual cash inflows: Year | Cash flows 1 | 8000 2 | 10000 3 | 12000 4 | 14000 5 | 10000 Calculate the Payback Period.				
2	A. Enumerate factors impacting energy consumption in buildings. B. A newspaper boy has following probabilities of selling the magazine No of copies sold | Probabilities 10 | 0.10 11 | 0.15 12 | 0.20 13 | 0.25 14 | 0.30 Cost copy is 30 paise and selling price is 50 paise. He cannot return unsold copies. How many copies he should order	10 10	1 2	2 3	7 2
3	During a large infrastructure project, you identify several potential threats: • A key supplier might go bankrupt. • There's a chance of severe weather delaying construction. • A certain task involves high financial risk but is critical. • A non-critical component might face minor delays. Match each threat with the most appropriate mitigation strategy (avoid, transfer, share, accept), and justify your reasoning.	20	2	2,3	3
4	A. Discuss Claim Process for Machinery breakdown insurance/ Loss of Performance of construction equipment policy. B. Write a note on exclusions of Machinery breakdown insurance/ Loss of Performance of construction	10 10	3	1,2	4

	equipment policy.				
5	A. Identify and explain common reasons for poor value in projects or product development, including factors such as lack of time, lack of information, lack of ideas, misconceptions, temporary solutions that become permanent, habits, attitudes, and politics. How can awareness of these issues improve value engineering outcomes? B. In project selection under risk, decision-makers often use various techniques to account for uncertainty and variability. Describe the following methods used to incorporate risk into the decision-making process: Judgmental Evaluation, Payback Period Requirement, Certainty Equivalent Method, Risk-Adjusted Discount Rate Method, and Three-Point Estimate. What are the strengths and limitations of each?	10 10	3 3	2 1	5 5
6	Describe the phases of a Value Analysis Job Plan, including Orientation, Information, Speculation, Analysis, Development, Presentation, Implementation, and Follow-up. How does each phase contribute to achieving cost-effective and high-value solutions in a project?	20	3	2,3	6
7	Mr Sinha had to decide whether or not to drill a well on his farm. In his village only 40% of the wells drilled were successful at 200 feet of depth. some of the farmers who did not get water at 200 feet drilled further up to 250 feet but only 20% struck water at 250 feet. Cost of drilling is ₹50 per foot. Mr Sinha estimated that he would pay ₹18,000 during 5 year. period In the present value terms if he continues to buy water from the neighbour rather than go for the well which would have a life of 5 years. Mr Sinha has 3 decision to make a should he drink up to 200 feet b if no water is found at 2:00 100 feet should he drill up to 250 feet feet C should he continue to buy water from his neighbour. A. draw up an appropriate decision tree. B. What will be Mr. Sinha strategy under EMV (expected monetary value) approach?	20	4	1,2,3	2

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END SEM/RE-EXAM EXAMINATION -MAY / JUNE 2025

Program: M.Tech Construction Management Sem II
Course Code: PE-MTCM211
Course Name: Management of Construction Resources

Duration: 3 Hrs.
Maximum Points: 100
Semester: II

Notes:
1. Attempt any 5 question out of 7 questions.
2. Answers to all sub questions should be grouped together.
3. Assume Suitable data if necessary and state it clearly.

Q.No.	Questions	Points	CO	BL	Module No.
1	a. Explain the concept of collective bargaining in detail.	10	1	2	1
	b. Evaluate the consequences of prolonged strikes and lockouts on safety, quality, and workforce stability in construction projects.	10	1	5	1
2	a. Discuss the methods used to forecast human resource demand in large-scale projects.	10	1	2	2
	b. 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	2,5	2
3	a. Discuss how mechanization can be applied to reduce labor dependency in large-scale construction projects.	10	2	3	3
	b. Write a note on i. Vendor analysis ii. Material codification	05 05	3	2	5
4	a. Design a strategy to manage equipment obsolescence in a large-scale construction company.	10	2	6	4

END SEM/RE-EXAM EXAMINATION -MAY / JUNE 2025

	b. Determine owning and operating cost from following Machine two Meter Cube engine crawler mounted power shovel Engine = 160 HP Crank case capacity = 30 Liters Useful life = 5 years Time between oil changes = 100 hours Shipping weight =104 tonnes Factory Price of equipment = 700000 Salvage value =10% Operating Factor = 0.6 Freight charges =Rs. 39 per tone Unloading and Assemble charges = Rs. 1000 Hours used per year = 5000 hours Maintenance and repairs = 90% of depreciation Investment cost = 15 % of average annual investment Labour cost = Rs. 18000 per month Rate of fuel = Rs.60 per lit. Overhead cost = 3% owning cost	10	2	4	4
5	a. List the Key Components of a Construction Requisition Form. Prepare a draft of a material requisition form to be used for ordering cement and steel for a construction project.	10	3	1,3	5
	b. Explain the precautions to be taken during storage and transport of materials.	10	3	2	6
6	a. A construction company purchases 20,000 bags of cement annually. Each bag of cement costs 400 and the cost incurred in procuring each lot is 100. The cost of carrying is 20 per cent. What is the most economic order quantity? What is the average inventory level? Also if the lead time of procuring cement is two weeks, determine the reorder point.	10	3	4	6
	b. How would you assign resources to tasks in Primavera P6, and how would you handle resource leveling?	5	3	3,4	7

END SEM/RE-EXAM EXAMINATION -MAY / JUNE 2025

	c. How would you create a baseline in Microsoft Project, and why is it important for project tracking?	5	3	3,4	7
7	a. The cost of power shovel is Rs. 5 lakhs and its salvage value is 10 % of an original cost. The power shovel is used for 1400 hours per year and its life is 5 years. The hiring charges for power shovel including maintenance and repairs is 25000/- per month. Suggest whether power shovel should be purchased or hired.	10	2	4	4
	b. A Construction company stores various items in the central stores. Classify items using ABC analysis using following data.	10	3	4	6

Item	Units	Unit Price (Rs.)
1	700	50
2	2400	30
3	150	100
4	60	220
5	3800	15
6	4000	5
7	6000	2
8	300	35
9	30	80
10	2900	4