

Bachelor of Engineering(Civil Engineering)
Fifth Year Second Semester Exam -2025
Subject: Construction Management

Time: Three hours

Full Marks: 100

Answer any five questions

No. of Qs	1) All notations represent their standard relevant meaning. 2) Assume suitable data, if necessary.	Marks																																																
1.a)	What do you mean by ‘Delegation of Authority’? Briefly mention the factors for determining the amount of centralization /decentralization appropriate for an enterprise. Explain the role of ‘Directing’ and ‘Controlling’ as processes of Construction Management	2 6 4																																																
b)	A record of maintenance cost is kept on 6 identical machines of different ages. Management wants to determine whether there is functional relationship between machine age (X) and maintenance cost (Y). The following data are obtained: <table><tr><td>Machine</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>X (Years)</td><td>2</td><td>1</td><td>3</td><td>2</td><td>2</td><td>3</td></tr><tr><td>Y (Rupees)</td><td>3500</td><td>2000</td><td>2500</td><td>4000</td><td>3000</td><td>10000</td></tr></table> Find the regression equation of Y on X. What would be the maintenance cost for a five year old machine?	Machine	1	2	3	4	5	6	X (Years)	2	1	3	2	2	3	Y (Rupees)	3500	2000	2500	4000	3000	10000	8																											
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2a)	State the advantages and limitation of Bar Chart in construction industry.	6																																																
b)	The following table shows the jobs of a project with their duration in days. Draw the network and determine the critical path. Also calculate the floats. <table><tr><td>jobs</td><td>1-2</td><td>1-3</td><td>1-4</td><td>2-5</td><td>3-7</td><td>4-6</td><td>5-7</td><td>5-8</td><td>6-7</td><td>6-9</td><td>7-10</td></tr><tr><td>Duration</td><td>10</td><td>8</td><td>9</td><td>8</td><td>16</td><td>7</td><td>7</td><td>7</td><td>8</td><td>5</td><td>12</td></tr><tr><td>jobs</td><td>8-10</td><td>9-10</td><td>10-11</td><td>11-12</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Duration</td><td>10</td><td>15</td><td>8</td><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	jobs	1-2	1-3	1-4	2-5	3-7	4-6	5-7	5-8	6-7	6-9	7-10	Duration	10	8	9	8	16	7	7	7	8	5	12	jobs	8-10	9-10	10-11	11-12								Duration	10	15	8	5								10
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c)	Draw a network in the following case. <table><thead><tr><th><u>Activity</u></th><th><u>Immediate predecessor</u></th></tr></thead><tbody><tr><td>A</td><td>-----</td></tr><tr><td>B</td><td>-----</td></tr><tr><td>C</td><td>A,</td></tr><tr><td>D</td><td>A,B,E</td></tr><tr><td>E</td><td>-----</td></tr></tbody></table>	<u>Activity</u>	<u>Immediate predecessor</u>	A	-----	B	-----	C	A,	D	A,B,E	E	-----	4																																				
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3a)	What do you mean by Inventory ? What is EOQ? Explain ABC analysis in Inventory Management.	2+2+6																																																
b)	ABC Ltd. uses EOQ logic to determine the order quantity for its various components and is planning its orders. The Annual consumption is 80,000 units, Cost to place one order is Rs. 1,200, Cost per unit is Rs. 50 and carrying cost is 6% of Unit cost. Find EOQ, No. of order per year, Ordering Cost and Carrying Cost and Total Cost of Inventory.	10																																																
4a)	A company will bid for a project consisting of several activities. Due to the uncertainties and risks, the engineer estimated the most optimistic, most likely and most pessimistic time for each activity as shown below (duration in days): <table><thead><tr><th>Activity</th><th>most optimistic time</th><th>most likely time</th><th>most pessimistic time</th></tr></thead><tbody><tr><td>(1,2)</td><td>4</td><td>8</td><td>12</td></tr><tr><td>(2,3)</td><td>1</td><td>4</td><td>7</td></tr><tr><td>(2,4)</td><td>8</td><td>12</td><td>16</td></tr><tr><td>(4,5)</td><td>0</td><td>0</td><td>0</td></tr><tr><td>(4,6)</td><td>3</td><td>6</td><td>9</td></tr><tr><td>(5,7)</td><td>3</td><td>6</td><td>9</td></tr><tr><td>(5,8)</td><td>4</td><td>6</td><td>18</td></tr><tr><td>(7,9)</td><td>4</td><td>8</td><td>12</td></tr><tr><td>(8,9)</td><td>2</td><td>5</td><td>8</td></tr><tr><td>(9,10)</td><td>4</td><td>10</td><td>16</td></tr><tr><td>(6,10)</td><td>4</td><td>6</td><td>8</td></tr></tbody></table> The manager now advised you to do the following i) Draw the PERT network of the project ii) Determine the expected time and variance for each activity	Activity	most optimistic time	most likely time	most pessimistic time	(1,2)	4	8	12	(2,3)	1	4	7	(2,4)	8	12	16	(4,5)	0	0	0	(4,6)	3	6	9	(5,7)	3	6	9	(5,8)	4	6	18	(7,9)	4	8	12	(8,9)	2	5	8	(9,10)	4	10	16	(6,10)	4	6	8	10
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b)	A construction Manager has two independent investments ‘A’ and ‘B’ available to him, but he lacks the capital to undertake both of them. Simultaneously, he can choose to take ‘A’ first and then stop, or if ‘A’ is successful then take ‘B’ or vice versa. The probability of success on ‘A’ is 0.7 while for ‘B’ it is 0.4, Both investments require an initial capital outlay of Rs 20,00,000/- and both return nothing, if the venture is unsuccessful. Successful completion of ‘A’ will return Rs 30,00,000/- and successful completion of ‘B’ will return Rs 50,00,000/-(over cost). Draw the decision tree and determine the best strategy.	10																																
5a)	Prepare Trading Account and Profit & Loss Account for the year ended Dec 31, 2024 taking the following information into account. Stock at Jan 01, 2024: Rs 12,00,000; Wages: Rs 3,20,000; Purchases: Rs 12,00,000; Freight: Rs 50,000; Sales: Rs 35,00,000; Sales Return: Rs 10,000; Rent on premises paid: Rs 20,000; Repairs: Rs 16,000; Discount allowed: Rs 50,000; Discount Received: Rs 40,000; General expenses: Rs 50,000; Bad debt: Rs 50,000; Sundry Debtors: Rs 3,50,000. Closing stock : Rs 3,50,000	10																																
b)	Prepare a balance sheet for X Co. with the following balances as on 31.3. 2025 <table><tr><td>Capital</td><td>1,86,00,000</td></tr><tr><td>Land property</td><td>36,00,000</td></tr><tr><td>Stock</td><td>28,00,000</td></tr><tr><td>Furniture</td><td>4,00,000</td></tr><tr><td>Buildings</td><td>40,00,000</td></tr><tr><td>Debtors</td><td>10,00,000</td></tr><tr><td>Creditors</td><td>10,00,000</td></tr><tr><td>Bills receivables</td><td>2,00,000</td></tr><tr><td>Plant & Machinery</td><td>38,00,000</td></tr><tr><td>Investment</td><td>32,00,000</td></tr><tr><td>Purchases</td><td>10,00,000</td></tr><tr><td>Goodwill</td><td>24,00,000</td></tr><tr><td>Cash in hand</td><td>1,60,000</td></tr><tr><td>Bank Overdraft</td><td>4,00,000</td></tr><tr><td>Loans</td><td>14,00,000</td></tr><tr><td>Bills payables</td><td>11,60,000</td></tr></table>	Capital	1,86,00,000	Land property	36,00,000	Stock	28,00,000	Furniture	4,00,000	Buildings	40,00,000	Debtors	10,00,000	Creditors	10,00,000	Bills receivables	2,00,000	Plant & Machinery	38,00,000	Investment	32,00,000	Purchases	10,00,000	Goodwill	24,00,000	Cash in hand	1,60,000	Bank Overdraft	4,00,000	Loans	14,00,000	Bills payables	11,60,000	8
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c)	Differentiate between Trading Account and P&L Account .	2
6a)	What are assets and liabilities on a balance sheet? Mention the types of Fixed Assets. What do you mean by Industrial Disputes. What are the conditions precedent to retrenchment of workmen.	6+3+3 +3
b)	Indian Oil Company took a decision for exploration of a certain land for availability of oil. The company offer the land owner an amount of Rs 12,00,000/- for obtaining permission for exploration and if oil is available, the land owner will be paid a further sum of Rs 120,00,000/- The company also made an alternative suggestion that If the land owner himself can incur the cost of Rs 20,00,000/- for exploration, he can expect the return of Rs 2,00,00,000/-. From the past exploration record, 65% chance of availability of oil can be predicted. Determine the choice of the land owner using Decision Tree Technique.	5
7)	Write short notes on any four:	4x5
a)	Conditions and compensations for layoff.	
b)	Event and Activity in Network Analysis	
c)	Role of organizing as a process of Management	
d)	Special features of PERT and CPM in Construction Management	
e)	Expected Monetary Value in connection with Decision Theory	
f)	Independent float of an activity.	