

Bachelor of Engineering (Civil Engineering)
5th Year 2nd Semester Examinations, 2024
Sub: Construction Management

TIME: 3 HRS

Answer any Five

Full Marks: 100

No. of Q	Assume any reasonable values to data not given. .	Marks																								
1.a)	Define Management. Draw the diagram showing interactive nature of Management Processes.	2+3																								
b)	State the importance of Planning & Organizing in the process of Construction Management	4+4																								
c)	<p>The data on the operating costs per year and re-sale prices of an equipment whose purchase price is Rs 1,00,000 are given below:</p> <table><tr><td>Year:</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>Operating costs (Rs):</td><td>15000</td><td>19000</td><td>23000</td><td>29000</td><td>36000</td><td>45000</td><td>55000</td></tr><tr><td>Resale Value (Rs):</td><td>50000</td><td>25000</td><td>12500</td><td>6000</td><td>4000</td><td>4000</td><td>4000</td></tr></table> <p>Calculate the optimum period of replacement.</p>	Year:	1	2	3	4	5	6	7	Operating costs (Rs):	15000	19000	23000	29000	36000	45000	55000	Resale Value (Rs):	50000	25000	12500	6000	4000	4000	4000	7
Year:	1	2	3	4	5	6	7																			
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2 a)	<p>A Co. has been awarded for construction of a new project. The project manager is seriously thinking for having the construction water required for the project. The following options are available:</p> <ul style="list-style-type: none">• Purchasing water from neighbor at Rs 1,50,000 over the next 9 years(in PV terms). <p style="text-align: center;">Or</p> <ul style="list-style-type: none">• Drilling a new tube well. <p>The project manager got the information that in the past only 65% of wells drilled were successful at 200 ft depth. Moreover, on finding no water at 200 ft. some persons drilled it further up to 250 ft. The prevailing cost of drilling is Rs 1200 per ft.</p> <p>The following decisions can be optimal.</p> <ul style="list-style-type: none">i) Do not drill any well,ii) Drill up to 200 ft andiii) If no water is found at 200ft. depth, drill further upto 250 ft. <p>Draw the decision tree and determine the best strategy.</p>	12																								

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b)	<p>For fixation of salary of Miller operator of a company, the Project Manager of the Company collected data from the locally available operators.</p> <p>Years of Service: 11 7 9 5 8 6 10</p> <p>Income (in thousands): 10 8 6 5 9 7 11</p> <p>What should be the salary of an operator with 14 years of experience applied for the post?</p>	8																																																						
3 a)	<p>The interdependencies of various activities and their normal and crash time and cost are depicted in the following table.</p> <table><tr><th>Activity</th><th>Predecessor activity</th><th>Normal Time (weeks)</th><th>Normal Cost (Rs)</th><th>Crash Time (weeks)</th><th>Crash Cost (Rs)</th></tr><tr><td>A</td><td>-----</td><td>9</td><td>1,20,000</td><td>6</td><td>1,80,000</td></tr><tr><td>B</td><td>A</td><td>14</td><td>1,40,000</td><td>4</td><td>2,40,000</td></tr><tr><td>C</td><td>A</td><td>4</td><td>20000</td><td>3</td><td>24000</td></tr><tr><td>D</td><td>C</td><td>6</td><td>4,40,000</td><td>4</td><td>5,60,000</td></tr><tr><td>E</td><td>-----</td><td>14</td><td>16000</td><td>13</td><td>18000</td></tr><tr><td>F</td><td>E</td><td>6</td><td>40000</td><td>6</td><td>40000</td></tr><tr><td>G</td><td>B,D</td><td>5</td><td>40000</td><td>3</td><td>48000</td></tr><tr><td>H</td><td>F,G</td><td>2</td><td>120000</td><td>1</td><td>1,40,000</td></tr></table> <p>Indirect costs are Rs 20000 per week.</p> <p>Crash systematically the activities and determine the optimum duration and cost.</p>	Activity	Predecessor activity	Normal Time (weeks)	Normal Cost (Rs)	Crash Time (weeks)	Crash Cost (Rs)	A	-----	9	1,20,000	6	1,80,000	B	A	14	1,40,000	4	2,40,000	C	A	4	20000	3	24000	D	C	6	4,40,000	4	5,60,000	E	-----	14	16000	13	18000	F	E	6	40000	6	40000	G	B,D	5	40000	3	48000	H	F,G	2	120000	1	1,40,000	14
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b)	Mention the importance of Bar chart in Time Management and Scheduling.	6																																																						

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4a)	<p>A real estate builder is in the process of quoting a tender called by Housing Board for construction of Residential Accommodations.</p> <p>The construction manager has listed down the activities in the project as under. (time estimates in months)</p> <table><tr><th>Activity</th><th>Preceding Activity</th><th>Most Optimistic</th><th>Most Likely</th><th>Most Pessimistic</th></tr><tr><td>A</td><td>None</td><td>2</td><td>4</td><td>12</td></tr><tr><td>B</td><td>None</td><td>10</td><td>12</td><td>26</td></tr><tr><td>C</td><td>A</td><td>8</td><td>9</td><td>10</td></tr><tr><td>D</td><td>A</td><td>10</td><td>15</td><td>20</td></tr><tr><td>E</td><td>A</td><td>7</td><td>7.5</td><td>11</td></tr><tr><td>F</td><td>B,C</td><td>9</td><td>9</td><td>9</td></tr><tr><td>G</td><td>D</td><td>3</td><td>3.5</td><td>7</td></tr><tr><td>H</td><td>E,F,G</td><td>5</td><td>5</td><td>5</td></tr></table>	Activity	Preceding Activity	Most Optimistic	Most Likely	Most Pessimistic	A	None	2	4	12	B	None	10	12	26	C	A	8	9	10	D	A	10	15	20	E	A	7	7.5	11	F	B,C	9	9	9	G	D	3	3.5	7	H	E,F,G	5	5	5	
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F	B,C	9	9	9																																											
G	D	3	3.5	7																																											
H	E,F,G	5	5	5																																											
i)	Draw the PERT network for the project.	3																																													
ii)	Determine the critical path	3																																													
iii)	Find the expected time and variance for each activity.	2+2																																													
b)	Compare PERT and CPM techniques in project management.	6																																													
c)	Explain the terms “Payoff Value” and “Expected Monetary Value” in connection with Decision Theory.	4																																													

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5a)	<p>At the end of the accounting year, the accountant of 'X' Co. extracts the following balances from his accounts books as on 31.12 2023.</p> <table><tr><td></td><td>(Rs)</td></tr><tr><td>Stock at Jan 01,2023</td><td>19,20,000</td></tr><tr><td>Wages</td><td>6,40,000</td></tr><tr><td>Purchases</td><td>24,00,000</td></tr><tr><td>Freight</td><td>1,00,000</td></tr><tr><td>Sales</td><td>50,00,000</td></tr><tr><td>Sales Return</td><td>20,000</td></tr><tr><td>Rent on premises paid</td><td>40,000</td></tr><tr><td>Repairs</td><td>32,000</td></tr><tr><td>Discount allowed</td><td>1,00,000</td></tr><tr><td>Discount Received</td><td>80,000</td></tr><tr><td>General expenses</td><td>1,00,000</td></tr><tr><td>Bad debt</td><td>1,00,000</td></tr></table> <p>You are required to prepare Trading Account and Profit & Loss Account for the year ended Dec 31,2023, taking the following information into account:</p> <ul style="list-style-type: none">. Stock at December 31,2023 was Rs 7,00,000		(Rs)	Stock at Jan 01,2023	19,20,000	Wages	6,40,000	Purchases	24,00,000	Freight	1,00,000	Sales	50,00,000	Sales Return	20,000	Rent on premises paid	40,000	Repairs	32,000	Discount allowed	1,00,000	Discount Received	80,000	General expenses	1,00,000	Bad debt	1,00,000	10
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Bad debt	1,00,000																											
b)	Also calculate for 'X' company:	2+2																										
i)	The turnover for the year ended 2023.																											
ii)	The percentage of gross profit over turnover.																											
c)	Mention the advantages and disadvantages of Decentralization over Centralization.	6																										

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6a)	<p>A construction company is in the process of quoting a tender called by a Public Sector Undertaking for construction of a portion of National Highway. The winning of tender also depends on how soon the company is able to complete the work. The Construction manager has listed down the activities in the project as under:</p> <table><tr><th>Sl No</th><th>Activity</th><th>Immediate Preceeding Activity</th><th>time (week)</th></tr><tr><td>1</td><td>A</td><td>-----</td><td>3</td></tr><tr><td>2</td><td>B</td><td>-----</td><td>4</td></tr><tr><td>3</td><td>C</td><td>A</td><td>5</td></tr><tr><td>4</td><td>D</td><td>A</td><td>6</td></tr><tr><td>5</td><td>E</td><td>C</td><td>7</td></tr><tr><td>6</td><td>F</td><td>D</td><td>8</td></tr><tr><td>7</td><td>G</td><td>B</td><td>9</td></tr><tr><td>8</td><td>H</td><td>E,F,G</td><td>3</td></tr></table>	Sl No	Activity	Immediate Preceeding Activity	time (week)	1	A	-----	3	2	B	-----	4	3	C	A	5	4	D	A	6	5	E	C	7	6	F	D	8	7	G	B	9	8	H	E,F,G	3	
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7	G	B	9																																			
8	H	E,F,G	3																																			
i)	Find out the completion period.	4																																				
ii)	Find out the total float, free float and independent float for each activity	6																																				
b)	Draw a network in the following case.	6																																				
	<table><tr><th><u>Activity</u></th><th><u>Immediate predecessor</u></th></tr><tr><td>A</td><td>-----</td></tr><tr><td>B</td><td>-----</td></tr><tr><td>C</td><td>A,E</td></tr><tr><td>D</td><td>A,B</td></tr><tr><td>E</td><td>-----</td></tr></table>	<u>Activity</u>	<u>Immediate predecessor</u>	A	-----	B	-----	C	A,E	D	A,B	E	-----																									
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c)	Define activity and event in connection with network analysis.	4																																				

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<p>7)</p> <p>a)</p> <p>b)</p> <p>c)</p> <p>d)</p> <p>e)</p>	<p>Write short notes on any four:</p> <p>Optimistic and pessimistic time in connection with PERT/CPM</p> <p>Trading Account and Profit & Loss Account.</p> <p>Factors considered in determining the amount of De-centralization?</p> <p>Role of Directing as a process of Management</p> <p>Regression and Correlation in connection with Forecasting Techniques.</p>	<p>5X4</p>