Bachelor of Engineering (Civil Engineering)
Fifth Year Second Semester Supplementary Exam.2023
Sub: Construction Management

Time: 3 Hr.   **Full Marks 100**

Answer any *five*.

No. of Q	Assume any reasonable values to data not given.	
1.a)	Differentiate between centralization and decentralization of Organization Authority.	6
b)	Explain the role of 'Organizing' as a process of Construction Management.	2

c)	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:
	• Purchasing water from neighbour at Rs 1,50,000 over the next 9 years(in PV terms).
	or
	• Drilling a new tube well.
	
	However, the project manager got the information that in the past only 60% of wells drilled were successful at 300 ft depth. Moreover, on finding no water at 300 ft. some persons drilled it further up to 350 ft. The prevailing cost of drilling is Rs 900 per ft.
	The following decisions can be optimal.
	   i) Do not drill any well,
	   ii) Drill up to 300 ft and
	   iii) If no water is found at 300ft. depth, drill further upto 350 ft.
	
	Draw the decision tree and determine the best strategy.
		12

The most optimistic, most likely and most pessimistic time for each activity is shown below:

Activity	most optimistic time	most likely time	most pessimistic time
(1,2)	9	12	15
(2,3)	1	4	7
(2,4)	12	15	48
(3,5)	14	20	26
(3,6)	4	7	16
(3,7)	4	7	16
(6,7)	5	8	11
(4,7)	2	8	14
(7,8)	9	12	15
(8,9)	1	4	7
(5,6)	0	0	0

2 a)		10
i	Draw the PERT network of the project.	
ii	Find out the completion period.	
iii	Determine the expected time and variance for each activity	

No. of Q		
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:	

Machine	A	B	C	D	E	F
X (Years)	2	1	3	2	2	3
Y (Rupees)	7000	4000	1000	8000	5000	10000

Find the regression equation of Y on X. What would be the maintenance cost for a four year old machine?

10

3a) 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:

Sl No	Activity	Immediate Preceding	Activity time (week)
1	A	----------	5
2	B	-----------	6
3	C	A	3
4	D	A	6
5	E	C	7
6	F	D	8
7	G	B	9
8	H	E,F,G	3

i   Find out the completion period.

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ii   Find out the total float, free float and independent float for each activity

b) The data on the operating costs per year and re-sale prices of an equipment whose purchase price is Rs 2,10,000 are given below

Year:	1	2	3	4	5	6	7
Operating costs (Rs)	16000	19000	22000	28000	37000	45000	55000
Resale Value (Rs):	60000	25000	13000	6000	5000	5000	5000

Calculate the optimum period of replacement.

8

c) Define 'Free Float ' of an activity.

2

4a)   At the end of the accounting year, the accountant of X Co. extracts the following balances from his accounts books as on 31.12 2022.

	(RS)
Stock at Jan 01,2022	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	72,000
Discount allowed	1,00,000
Discount Received	80,000
General expenses	1,00,000
Bad debt	1,00,000

10

Prepare Trading Account and Profit & Loss Account for the year ended Dec 31,2022 , taking the following information into account .

Stock at December 31,2022 was Rs 7,00,000

b)   Prepare a balance sheet for X Co. with the following balances as on 31.3.2022:

	Rs
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

10

5a)	Discuss the application of PERT and CPM techniques in Construction Industries.	7
b)	What are the situations in which an equipment requires replacement ?	4
c)	Differentiate between Activity and Event in connection with Network Analysis.	6
d)	What is the importance of Planning in Construction Management.	3
6a)	Jobs A ,B, C........H ,I constitute a project. The notations X<Y means that the task X must be finished before Y can begin. With this notation A<D,A<E, B<F,D<F,C<G,C<H,F<I,G<I. Draw a net work to represent the sequence of Jobs and find the critical path as well as the project completion time, when the time (in days) of completion of each job is as follows:	10

Job: A   B   C   D   E   F   G   H   I

Time: 16   20   16   20   32   34   36   28   18

b)	Define Payoff and Expected Monetary Value.	6
c)	Importance of identifying the Critical Path in Network Analysis.	4
7)	Write short notes on any four :	5x4
a)	Trading Account and Profit & Loss Account.	
b)	Liability in connection with Balance Sheet	
c)	Delegation of Authority .	
d)	Advantages and limitations of Bar Chart	
e)	Fixed Assets and Current Assets	