

Activity	Resource		Duration	Activity	Resource		Duration
	A	B			A	B	
1-2	0	2	5	3-6	2	2	5
1-3	2	1	1	4-7	0	3	1
1-4	3	0	2	6-8	3	3	3
2-5	1	1	4	7-8	0	0	4

Activity 5-8 is dummy activity

- (b) For the same project (part a) the shortest time and longest (crash and de-crash duration) in which the activity can be completed and the increase/ decrease in cost per day for reducing the time of each activity is given. The contract includes the penalty clause of Rs 1000 per day over 7 days and bonus of Rs. 500 per day for less than 7 days. The overhead (Indirect) cost per day is Rs 1600. The cost of completing the eight activities in normal time is Rs. 65000. Calculate the lowest cost and the associated project duration.

Activity	Crash duration	De-crash duration	slope
1-2	4	6	500
1-3	1	1	-
1-4	2	3	300
2-5	2	6	800 for first day, and 1200 for subsequent day
3-6	3	7	800
4-7	1	1	-
6-8	1	3	500
7-8	2	6	200

- (c) What will be your suggestion (in term of duration of project) keeping part a and part b in consideration

(20+20+5)

Q.5 For the following data of a project, (a) prepare the month-wise running account bill, (b) prepare the cash inflow S-curve for the contractor, (c) prepare the cash outflow S-curve for the contractor.

- The quoted cost of the contract is Rs. 76,50,000
- Duration of contract: Four months
- The contractor submit the bill at the end of every month and payment is made immediately.
- The owner makes an advance payment of Rs. 10 Lakhs, which is to be recovered in four equal installments (each month).
- The construction schedule has been prepared by the contractor and has been approved by the owner (Table below).

S. No:	Item description	Unit	Total quantity	Rate (Rs.)	Amount (Rs.)	Quantities to be executed in			
						Month 1	Month 2	Month 3	Month 4
1	Earthwork in excavation	m ³	500	50	25,000	500			
2	R.C.C.	m ³	1,000	4,000	40,00,000	250	500	250	
3	Brickwork	m ³	2,000	1,000	20,00,000	500	600	900	
4	Sanitary works	L.S	----	----	2,00,000			50%	50%
5	Electrical works	L.S	----	----				50%	50%
6	Woodwork	L.S.	----	----	2,50,000			50%	50%
7	Finishing work	m ²	4,750	200	9,50,000				4750

L.S.: Lump sum

Additional constraints and assumptions:

- The cost for the contractor to execute a particular item is 90 per cent of their quoted rates (cost of the project).
- Assume that there is delay of one month occurs in paying to the subcontractors, material suppliers, and plant and machinery supplier.
- Retention is 10 per cent of billed amount in every bill. Fifty per cent retention amount is payable after one month of practical completion, while remaining 50 percent is payable four months later.

(10+5+10)