

CVL775		CONSTRUCTION ECONOMICS AND FINANCE	MID TERM EXAMINATION	
Time allowed 2 hour	10:30 - 12:30		Maximum Marks	40
Venue	LH-408		Date	19.02.2024

Course coordinator:

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WISH YOU THE VERY BEST

ANSWER ALL QUESTIONS. EVALUATION WOULD BE DONE ON THE BASIS OF STEPS USED IN THE SOLUTION. ASSUME MISSING DATA SUITABLY IF REQUIRED. USE OF SCIENTIFIC CALCULATOR, INTEREST TABLE, AND FORMULA SHEETS ARE ALLOWED.

Q1 In the following project bar chart, activity name and the 10 corresponding duration of completion in months are shown.

Activity	Duration (Month)											
	1	2	3	4	5	6	7	8	9	10	11	12
A	■	■										
B			■	■	■	■						
C			■	■	■							
D							■	■	■	■		
E						■	■	■				
F											■	■

Using the following data, prepare the project cash flow diagram for the contractor.

The amount quoted by the contractor for activities A, B, C, D, E, and F are 1.4 million, 4.0 million, 0.6 million, 8.0 million, 3.2 million, and 2.8 million dollars respectively. Assume uniform progress of works during the stipulated duration of the activity. Contractor submits monthly bill. There is a delay of one month by owner in paying the bill. The contractor also delays payment to subcontractor, material supplier, labour supplier, and plant & equipment supplier by one month. The total cost incurred by the contractor for an activity is 90% of the bill value. There is no retention and no mobilization advance.

A 1-4
B 4
C 0-6
D 8
E 3-2
F 2-8

- Q 2 A pumping scheme being developed has three different possible systems. If the life of the scheme is 20 years, which scheme should be recommended as the most economic? 10

Scheme	Installation cost	Annual running cost
A	\$18250	\$7250
B	\$20200	\$4600
C	\$24000	\$4000

Use 15% to represent the cost of capital. Use straight line method of depreciation and tax rate 40%. $(P/A, 15\%, 20) = 6.2593$

- Q 3 An asset has been purchased for \$ 100,000. The salvage value at the end of its expected life of 5 years is estimated to be \$ 10,000. Calculate the depreciation for each year using Double Declining Balance Method. Also calculate the Book Value of the asset at the end of each year. In which year you will switch over to straight line method of depreciation if it is allowed. 10

- Q 4 A contractor has a contract to construct a 3,600 metre long tunnel in 30 months. The contractor is trying to decide between the following two options: 10

Alternative A: Buy a tunneling machine and work with own labour force.

- Cost of tunneling machine = \$ 20 million
- Salvage value of machine at end of month 30 = \$ 4 million
- Cost of labour and material = \$ 10,000/m for the first 10 months, and increasing by 0.5 % per month at EOM each month thereafter (i.e. \$ 10050/m at EOM11, \$ 10100.25 at EOM 12, etc.)

Alternative B: Subcontract the work. Cost is \$ 27,000 per metre of tunnel.

You are to calculate the equivalent monthly cost under each alternative. $i = 1.50\%$ percent per month. Production under both alternatives will be 120 m per month.