



United International University (UIU)

Mid Term Examination

IPE 401/IPE3401: Industrial Management/Industrial & Operational Management

Spring Trimester: 2025

Total time: 1h 30 mins

Date: 21/4/2025

Total marks: 30

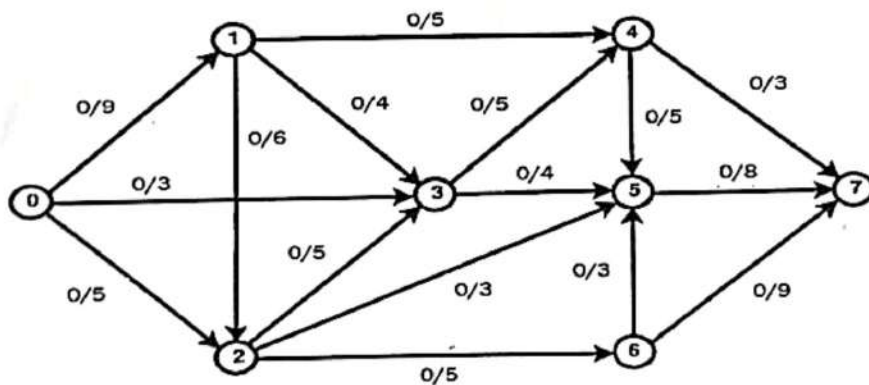
There are 4 questions. You must answer any 3 questions.

You must write serial no. on the top page of your answer script

- 1 (a) Mr. Suman invested some money at 15.5% interest rate compounded weekly for 40 years, and Mr. Sunny invested some money at 26% interest rate compounded quarterly for 30 years to reach 8 million. Whose investment was higher? And how many years it took for Sunny to reach 5 million? Show with necessary calculations. [4] [CO2]
- (b) A steel factory is open for 250 days a year. The demand for refractory material in the factory is 80 bags per day. Whenever an order is placed, it costs \$60, and the holding cost per unit per year is 30% of discount price. The quantity schedule chart is given below. Determine **Optimal order quantity** and **Total cost** associated with it. [6] [CO1]

Discount Number	Discount quantity	Discount %	Discount price\$
1	0 to 400	No discount	17
2	401 to 650	10%	?
3	651 and over	14%	?

2 (a)



[4] [CO2]

Find the maximum flow?

- (b) Two projects are given
Project "A"

[6] [CO1]

Year	0	1	2	3	4	5
Cash Flow	-30200	5520	8500	12300	16300	20000

Project "B"

Year	0	1	2	3	4	5
Cash Flow	-25,200	8,900	10,000	6,200	6,600	17,500

Now select the project using the **Discounted payback period method** and consider the rate = **23% compounded weekly**. Which project should you select?

- 3 (a) What do you mean by Economic order quantity? Explain with the necessary diagrams. [4] [CO2]

(b)

Year	0	1	2	3	4	5
Project A	-10,0000	30,000	40000	50000	20000	15000
Project B	-200,000	65,000	58,000	55,000	37,000	40,000

[6] [CO1]

Calculate the **IRR**, starting from 10%, using the trial-and-error method. If the required rate of return is **12%**, should the company accept the projects? (You must show the necessary calculations).

- 4 (a) A cheese factory produces specialty cheese wheels and operates 300 days a year. The weekly demand for the cheese wheels is 1,200 units, and the factory produces them at a rate of 600 units per day. Every time a production run is set up, it incurs a cost of \$400. The annual holding cost per unit is 15% of product cost, each wheel costs \$17. Calculate the **optimal production batch size**, the **total annual setup cost**, the **total annual holding cost** and **total cost**. [4] [CO2]

- (b) [6] [CO2]

Task	Predecessors	Duration
A	--	3
B	--	4
C	A	5
D	B	3
E	A, B	6
F	C, D	4
G	E	5
H	F, G	3

Find the critical path?