United International University (UIU)

Mid Term Examination

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

Fall Trimester: 2024

Total time: 1 hour 30 mins Date: 14/12/2024 Total marks: 30

Section: A/B/C/D/E/F/G

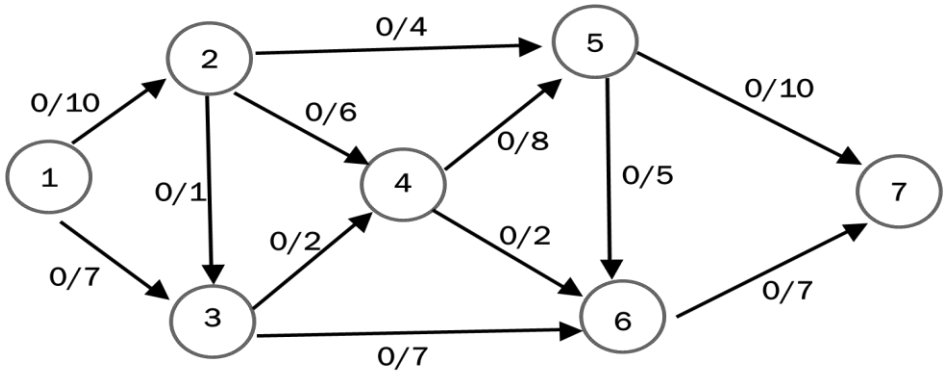
There are 5 questions. You must answer any **4** questions

1 (a) Mr. Suman invested $17239 at a certain effective rate, and after 29 years, he earned 1.5 million. Now find the following: i) find out the effective rate, and ii) find out what the future value will be if the rate is compounded weekly. **[3] [CO2]**

(b) Given the cash flows below and an annual interest rate of **10%** compounded annually, find the **Future Value (FV)** of all cash flows at the end of **Year 5**. **[4.5] [CO1]**

Year	0	1	2	3	4	5
Cash Inflow ($)	0	3000	4500	5000	6000	7500
Cash outflow ($)	10000	2000	1500	3500	4000	0

2 (a) Find Maximum Flow. **[3.5] [CO2]**



(b) Two projects are given **[4] [CO1]**

Project "A"

Year	0	1	2	3	4	5
Cash Flow	-26200	6520	18500	9700	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 = **22**% compounded **quarterly**. Which project should you select?

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

(b) **[4.5] [CO1]**

Year	0	1	2	3	4	5
Cash Flow	-65000	19,000	13,300	17,000	26,500	11,200

Calculate the **IRR,** starting from 8%, and show necessary calculations.

4 (a) A certain chip factory has a monthly demand of 660 units. The production rate of Fried chips is 200 per day. The demand for these produced chips is 1050 per week, the set-up cost is $40, the holding cost is $3.5, the number of working days is 320 in a year, and the lead time is 7 days. Determine the **optimal production order quantity** and **reorder point**. **[3] [CO2]**

(b) A steel factory is open for 230 days a year. The demand for refractory material in the factory is 100 bags per day. Whenever an order is placed, it costs $48, and the holding cost per unit per year is 40%. The quantity schedule chart is given below. Determine **Optimal order quantity** and **Total cost** associated with it. **[4.5] [CO2]**

Discount Number	Discount quantity	Discount %	Discount price$
1	0 to 500	No discount	17
2	501 to 700	10%	?
3	701 and over	14%	?

5 (a)

Task	Predecessors	Duration
A	--	3
B	A	5
C	A	2
D	B	4
E	B, C	6
F	C	3
G	D, E	5
H	E, F	4

[5] [CO2]

Find the Critical Path.

(b) Find the benefit-cost ratio of the following project. Here the MARR is 14% **[2.5] [CO1]**

Year	0	1	2	3	4
Benefit	0	11500	11000	18500	8200
Cost	16000	6000	2500	7900	15000

CO1-Apply Engineering economics and simple mathematics for Solving project selection problems for choosing the best possible project.

CO2- Analyze various industrial problems by using operation management, technique, operation research technique and cost accounting techniques and solve it.