United International University (UIU)

Mid Term Examination

IPE 3401: Industrial and Operational Management

Spring Trimester: 2022

Total time: 1:45 hours | Date: 02/04/2022 | Total marks: 30

Section: A/B/C

There are 5 questions. You may answer question 3 & 4 and any Two of 1, 2 &5

1 (a) Draw the S curve of technological progress and explain where the technology is at risk of substitution by newer technologies? [2] [CO2]

(b) Mr. Pathy invested $25169 at a certain effective rate for about 39 years and earned 2 million. First, find out the effective rate and then find out the nominal interest rate which was compounded quarterly. [3.5] [CO1]

2 (a) You are the owner of a famous beverage company named "Cheps". It is a different carbonated drink. It has high dose of caffeine in it and because of that, it is not suitable for everyone and it costs $2 extra than normal beverages. But the people, who like caffeine, buy the drinks with that extra price. Find Which level of micromarketing is this with explanation. [3] [CO2]

(b) Two independent projects are given [5.5] [CO1]

Project "Basic"

Year	0	1	2	3	4	5
Cash Flow	-15102	5000	8800	9900	2000	1671

Project "Advanced"

Year	0	1	2	3	4	5
Cash Flow	-9780	6189	3816	3325	511	1331

Now select the project using **Discounted payback period** method and consider hurdle rate =19% compounded daily. Selection authority wants the payback within 3.5 years

3 (a) Two projects have cash flow shown below [5.5] [CO1]

Project "Q"

Year	0	1	2	3	4	5
Cash Flow	-8000	5601	3005	124	1600	2900

Project "P"

Year	0	1	2	3	4	5
Cash Flow	-7813	4002	2089	153	1500	1021

Which project will you select considering 5% cost of capital and applying **IRR** method when the projects are Mutually exclusive?(Use trial and error method)

(b) If you apply **NPV** method with the given interest rate and consider them independent, will the answer be same? Explain and show proper calculations. [2] [C

4 (a) The production rate of "Fun chips" is 150 packets per day. The weekly demand is 700 packets, set up cost is $30 and holding cost is $3 and number of working days are 240 in a year. [2] [C

i) Determine optimal order quantity

ii) Determine expected "time between orders"

(b) Determine expected "time" for Abul Khair Steel Mill is about 1000 bags per day. Number of working days per 260. The cost associated with each order is about $76. The holding cost is 15%. The quantity discount schedule sheet is given below. Determine **Optimal order quantity** and **Total cost** associated with it. [5.5] [CO2]

Discount Number	Discount quantity	Discount %	Discount Price$
1	0-500	no discount	16
2	501 to 5000	15%	9
3	5001 and over	20%	7

5 (a) Luffy, Zoro, Chopper, Nami, Robin, and Franky, these 6 friends planned for a tour to Cox's Bazar. Luffy was managing everything of the tour and he collected the money from everyone. He also convinced Zoro's mom to let him go with them. Luffy asked Chopper to buy bus tickets 2 weeks before the tour and asked Nami to book 2 rooms in a resort. Nami booked the resort properly, but Chopper forgot to buy the tickets. At the time of the tour everyone freaked out because there was no ticket available for that day and they had to postpone their tour. Luffy blamed Chopper for his irresponsibility and Chopper blame Luffy for not reminding him about the tickets. So among the 4 functions of management, which was absent in this case? Explain. [2] [CO2]

(b) Two Mutually exclusive public projects were being considered by govt. have the following estimated benefit and cost. By using NPV method, select the project and consider MARR 7% compounded semiannually. Show it with proper calculations. [5.5] [CO1]

Project "Q"

Year	0	1	2	3	4	5
Benefit	500	17000	12000	17525	9369	600
Cost	15010	5000	4500	8900	16000	1600

Project "P"

Year	0	1	2	3	4	5
Benefit	0	13313	16215	13259	3789	698
Cost	10000	4982	6789	9876	4323	452

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.