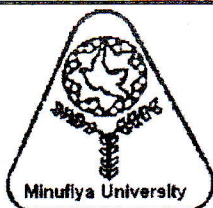


Menoufiya University
 Faculty of Engineering
 Shebin El- Kom
 Second Semester(June) Examination
 Academic Year: 2013-2014
 Date: 14/6/2014



Dept.: Production Engineering
 Year : Post-Graduate Diploma
 Subject: Engineering Economy
 Code : PRE 520
 Time Allowed: 3 hours
 Total Marks : 100 Marks

Allowed Tables and Charts: Tables -Interest Factors for Discrete Compounding
Examiner: Dr/ Mohamed Hesham Belal.

Answer All The Following Questions:

Question No.(1):

[25 Mark]

- (a)- Write a notes on the Economic Concepts: Cash flow diagram – Sensitivity Analysis – Engineering Economy. [5]
- (b)- A man has borrowed 30,000 L.E. to be paid after six years from now at a nominal annual interest rate of 8% compounded quarterly. Determine:
 1- the effective annual rate, 2- the accumulated amount should he paid,
 3- the nominal rate should be if compounding is to be monthly. [10]
- (c)- The construction of a road is cost 12,000,000 L.E. while its maintenance costs are:
 - *Annually* started in end of the first year with amount 25,000 L.E. while it increases by 2,000 L.E. in the next ten years and 50,000 L.E. after that, and
 - *Periodically* by 100,000 L.E. every five years. Note that the rate of compound interest of 7% annually and the road project's has been taken as long live project. What is the capital cost and the annual equivalent cost? [10]

Question No.(2):

[25 Mark]

- (a)- Define the different methods for economical assessment of projects, Stating for these methods the decision rule for a single project. [5]
- (b)- An inventor is considering a business opportunity which requires the receipts and disbursements shown below. [10]

End of Year	0	1	2	3	4	5
Disbursements(L.E.)	100,000	90,000	50,000	100,000	0	0
Receipts(L.E.)	0	10,000	100,000	150,000	50,000	120,000

- (1)- Draw the net cash flow for this investment opportunity, (2)- Would you recommend investing in this project , if the MARR = 9% , using Discounted payback period method.
- (c)- A company needs to buy a new production line for brick. There are two proposals available to do the same job: A- Automatic production line, B- Half automatic production line. The next table has the cash flow money for the two proposals. [10]

Proposal	First Cost (L.E.)	Annual operation cost (L.E.)	Annual labor cost (L.E.)	Salvage value (L.E.)	Estimated life (years)
A	260,000	25,000	30,000	40,000	14
B	100,000	15,000	60,000	10,000	7

Which one can be chosen to have economical feasibility if the annual rate of return is 9% by using: 1- The Present Worth Value method, 2- The Annual Equivalent Value method.

Question No.(3):

[25 Mark]

- (a)- Determine diagrammatically the elements of costs to state the selling price. [5]
- (b)- A project needs to buy a new equipment with first cost 255,000 L.E. The annual return for this equipment in the first year is 60,000 L.E., while it decreases by amount 5,000 L.E annually. The estimated salvage value is 30,000 L.E at the end of 9 years. Use the present worth value method to:
- i- indicate the sensitivity of the MARR value which fluctuates between 9% and 12%,
 - ii- calculate the internal rate of return for this project and the conditions to have economical feasibility. [10]
- (c)- A truck which cost 46,000 L.E. has an estimated useful life of 10 years and estimated salvage value of 9,600 L.E. What is the annual depreciation charge and book value at the end of the sixth year using:
- 1- Straight Line method,
 - 2- Declining balance method,
 - 3- Sum-of-years digit method. [10]

Question No.(4):

[25 Mark]

- (a)- Explain the following the Economic Concepts :inventory and its importance – Feasibility Studies - break-even point. [5]
- (b)- An industrial distributor purchases 5,000 boxes monthly to transport goods. Assume 320 working days/year. The information available for some of costs elements are given as:
- Unit (box) price = 0.7 L.E./unit, - Ordering/setup cost = 81 L.E./order
 - Annual inventory holding cost = 0.2 L.E./unit/year
 - Interest rate including taxes and insurance 10 % compounded annually.
- Calculate: 1- The optimum order quantity,
 2- The optimum number of orders per year and the cycle time,
 3- The minimum total annual inventory cost,
 4- The reorder point if the lead time is 12 days.
 5- Draw the inventory model showing all the information on it. [10]
- (c)- A company can produce 12,000 units per year at 100% of capacity. The depreciation of equipments is 15,000 L.E/year and the preparation cost is 5,000 L.E/year. The variable cost per unit is 6 L.E. and the net selling price per unit is 10 L.E. Use the mathematical and graphical methods to:
- i- Find the break-even point and the profit or loss/year at 50% and 100% production capacity,
 - ii- If the selling price is decreased by 15%, what is the break-even point and the profit or loss/year at 100% of capacity. [10]

With my best wishes

This exam measure the following ILOs												
Question No.	Q1-a	Q2-a	Q3-a	Q4-a	Q1-b	Q2-b	Q3-b	Q4-b	Q1-c	Q2-c	Q3-c	Q4-c
	a-1	a-3	a-4	a-3	b-1	b-5	b-1	b-5	c-1	c-2	c-1	c-2
Skills	Knowledge & Understand				Intellectual				Professional			