

11) The initial cost of an asset is \$10,000 with SL of 2000. Its depreciable life is 8 years.  
The second year depreciation using DOB is

$$R = \frac{2}{8} = 0.25 = 25\%$$

0	-	10,000	} 70,000	
1		$10,000 \times 25\%$ = 2,500		7,500
2		1875		

Answer = 1875

You have just bought a building for 400,000. You agreed to rent this building for 60,000 per year payable at the end of each year for 8 years. Fill the missing data in table below if tax rate is 20% (i.e. rent is taxable income), and before tax WACC = 7%. The depreciation is straight line for 20 years with no SV.

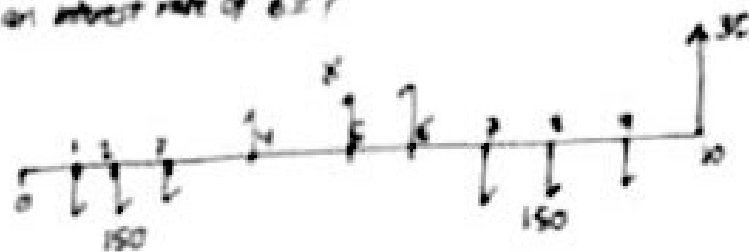
Year	BTCF	Depreciation	Taxable CF	Amount Taxes	ATCF
0	-400,000	—	—	—	-400,000
1	60,000	20,000	= 40,000	8,000	52,000
2	60,000	20,000	= 40,000	8,000	52,000

$$d_t = \frac{400,000}{20 \text{ year}} = 20,000$$

$$\text{before tax WACC} = 7.5\% = \frac{\text{After tax WACC}}{1 - 20\%} = 6\%$$

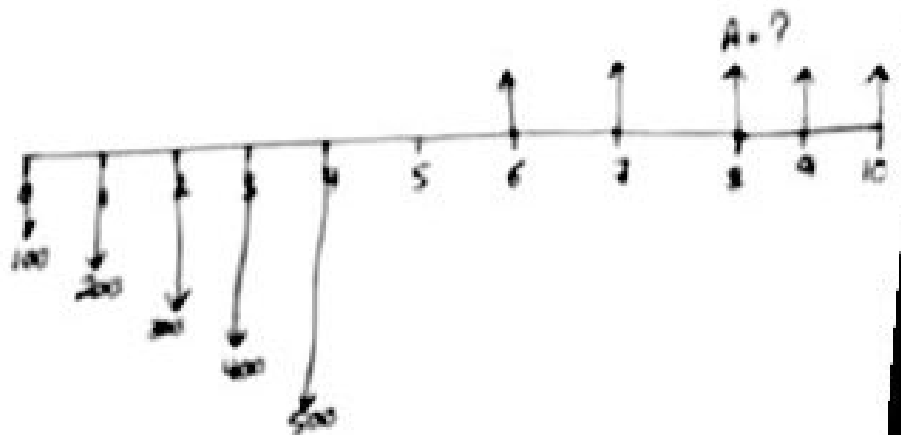
4] Consider the cashflow series shown below. What value of C makes the inflow series equivalent to the outflow series at an interest rate of 6%?

Return: 5771 and 3280



5] Find the equal payment amount A that makes the inflow equivalent to the outflow series at 11.72%.

A = 3547

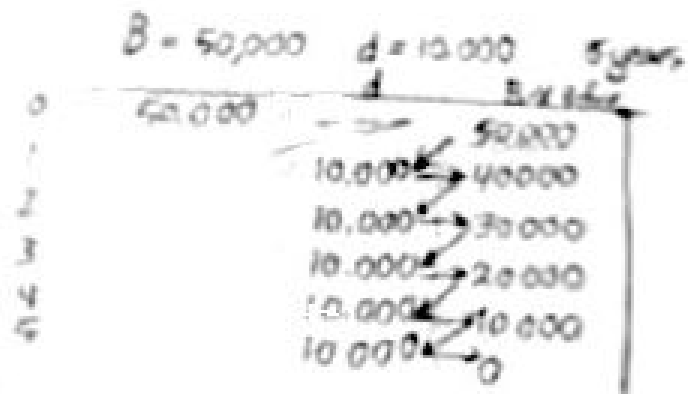


4- A and B and D are MEAs, independent on A

Alt	A	B	C	D
opt 1	Nothing			
opt 2	1	0	0	0
opt 3	1	0	1	0
opt 4	0	0	0	1
opt 5	0	1	0	1

5- 10,000 is the value of yearly depreciation of a piece of equipment when SL of depreciation was used. The basis cost (net cost) of the equipment is \$50,000 with a life of 5 years. The occurred S-V in this case is:

- A) 5000
- B) 20,000
- C) 10,000
- D) 0



6- if your MARR is 11% and you have found that  $IRR_A = 10\%$  and  $IRR_B = 9\%$  (both A and B are MEAs) The Alternative should be selected is:

- A) Alt A
- B) Alt B
- C) Alt A & B
- D) None

7- if your MARR is 10% per year the market value of bond that pays 8% per year, and has a face value of 20,000 JD with 5 years to mature is

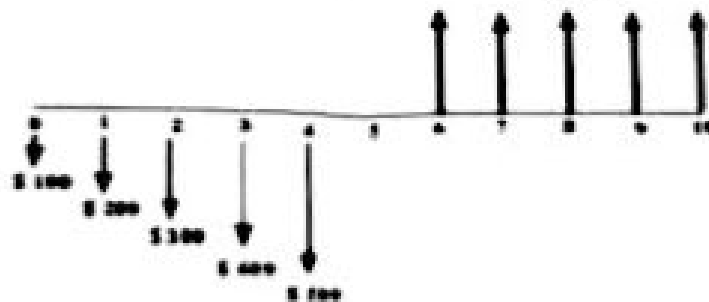
- A)  $16,000 (P/A, 8\%, 5) + 20,000 (P/F, 8\%, 5)$
- B)  $-20,000 + 16,000 (P/A, 10\%, 5) + 20,000 (P/F, 8\%, 5)$
- C)  $16,000 (P/A, 10\%, 5) + 20,000 (P/F, 10\%, 5)$
- D)  $2,000 (P/A, 8\%, 5) + 20,000 (P/F, 8\%, 5)$

$$V_n = C (P/A, i, N) + F (P/F, i, N)$$

(b) You have \$5,000 to invest in a financial security. From your point of view, which of the following is the worst deal?

- A. 11.2% compounded daily
- B. 11.8% compounded semi-annually
- C. 11.5% compounded quarterly
- D. 12% compounded annually

(c) Find the equal payment amount  $A$ , that makes the inflow series equivalent to the outflow series at  $i = 12\%$ , compounded annually.



- A.  $A = \$489$
- B.  $A = \$600$
- C.  $A = \$547$
- D.  $A = \$636$

(d) Consider the four mutually exclusive projects given below are with the same useful life. Also,  $IRR(B-A) = 17\%$ ,  $IRR(D-A) = 15\%$ ,  $IRR(C-D) = 10\%$ ,  $IRR(C-B) = 20\%$

Which project would you prefer based on the rate of return criterion at a MARR of 13%?

- A. A
- B. B
- C. D
- D. C
- E. Information insufficient to decide

Project	Investment at year 0	IRR
A	\$2,000	45%
B	\$2,500	40%
C	\$3,000	35%
D	\$3,500	30%

**Question 6** Circle "T" (for True) or "F" (for False) for each of the following statements.

- a) To invest any amount for one year at a (6%) compounded annually, is better than at a (6%) simple interest rate. T F
- b) The factor  $(F/A)(P/A, n)$  equals  $a - (P/A)(P/A, 1)$ . T F
- c) A nominal interest rate of 16% per year compounded quarterly is the same as a 4% per quarter. T F
- d) An interest rate of 12% per year compounded monthly is the same as an effective 12.683% per year. T F

I- Consider the four MEAs  $IRR(B-A) = 17\%$ ,  $IRR(D-A) = 15\%$ ,  $IRR(C-D) = 10\%$ ,  $IRR(C-A) = 20\%$  if  $MARR = 13\%$  which project is chosen?

Project	I	IRR
A	2000	45%
B	3500	30%
C	3000	35%
D	2500	40%

$(B-A) \rightarrow 17\%$   
 $(D-A) \rightarrow 15\%$   
 $(C-D) \rightarrow 10\%$   
 $(C-A) \rightarrow 20\%$

A - 2000  
 D - 2500  
 C - 3000  
 B - 3500

$D-A = 15\% > 13\% \rightarrow D$   
 $C-D = 10\% < 13\% \rightarrow D$   
 $B-D =$

- a. A
- b. B
- c. C
- d. D
- e. Information insufficient to decide

If your  $MARR = 15\%$  and you have found that  $IRR_A = 16\%$  and  $IRR_B = 17\%$  (both A and B are mutually independent opportunities) The alternatives that should be selected is :

- a) Alternative A
- b) Alternative B
- c) Both A & B
- d) More information need

$A - 25000 \quad 11\%$   
 $B - 35000 \quad 10\%$   
 $IRR(A-B) = 9\%$  choose  
 $IRR(B-A) = 9\%$  A

If your  $MARR$  is  $15\%$  and you have found that  $IRR_A = 16\%$  and  $IRR_B = 17\%$  (both A and B are MEAs), The alternatives that should be selected is :

- a) Alt A
- b) Alt B
- c) Both A & B
- d) More information needed

Final Exam

Engineering Economy

Summer 2013-2014

Name: \_\_\_\_\_

I.D.# \_\_\_\_\_

**Question 1** - If you purchase a house for \$100,000 by getting a 3 year loan with monthly payments using 10% per year compounded monthly, what is your monthly payment?

**Question 2** - The Capitalized Worth For a project with  $n = \infty$  annual equal incomes for 5 years starting from the 3<sup>rd</sup> year = \$4000 each,  $i = 9\%$  per year is?

**Question 3** - Based on the information, determine the value of each "?" in the following table:

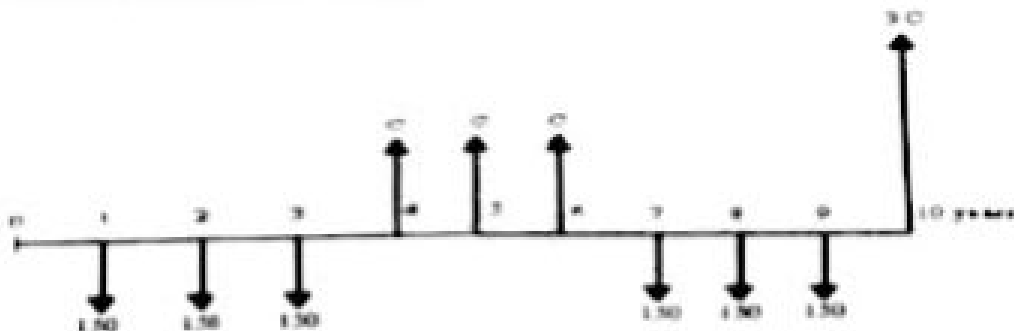
- Loan Principal - \$7500
- Interest Rate - 10%/yr
- Duration of Loan - 4 yr to be paid annual in 4 equal payments

EOY k	Interest Paid	Principal Repayment
1	\$750	?
2	?	?
3	?	?
4	?	?

**Question 4** - Use the Double (200%) Declining Balance (DDB) depreciation for an asset, with purchase cost = \$10,000; Useful life,  $N = 8$  years; Salvage value at end-of-year  $N = 0$ ; the Annual Income = \$18000, Annual Maintenance Cost = 7000, to calculate:

- a) The depreciation cost in the third year? 1,400
- b) The Book Value in the third year (BOY)? 4,200
- c) The BTCF in the third year? 11,300
- d) The ATCF in the third year? 9,900

**Question 5** - (a) Consider the cash flow series shown below. What value of (C) makes the inflow series equivalent to the outflow series at an interest rate of 6% compounded annually?



- A. less than \$160
- B. between \$161 and \$170
- C. more than \$191
- D. between \$181 and \$190
- E. between \$171 and \$180**