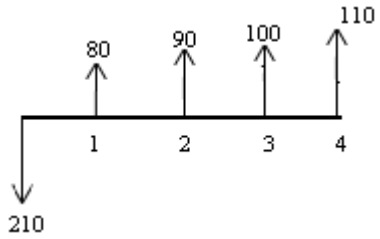
Ex.1 (28/336)

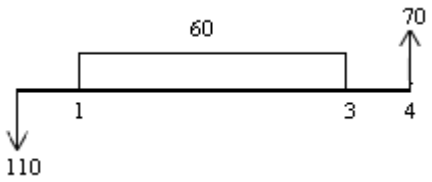
EOY	A001	B002	C003
0	**-$210**	**-$110**	**-$160**
1	**$ 80**	**$60**	**$80**
2	**$90**	**$60**	**$80**
3	**$100**	**$60**	**$80**
4	**$110**	**$70**	**$80**

1. **What is the annual worth and present worth of each alternative?**
2. **Which alternative should be recommended?**

A001



A002



A003

1. **Ranking approaches**

A001

P_W = -210 +80(P/F10,1) +90(P/F10,2)+110(P/F10,3)+100(P/F10,4)
=$ 87.37

A_W=87.37(A/P10,4)=$27.56

A002

P_W=-110 +60(P/A10,3)+70(P/F10,4)=$ 87.02

A_W= 87.02(A/P10,4)=$ 27.45

A003

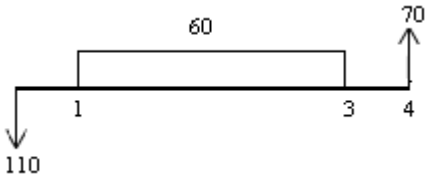
P_W=-160+(P/A10,4)=$93.59

A_W=93.59(A/P10,4)= $29.52

Select A003 since it has the highest P_W and A_W

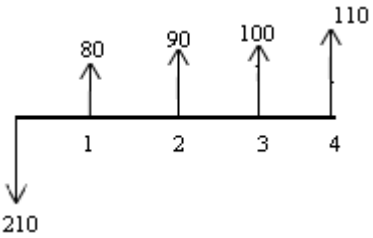
2. **Incremental approaches**

B



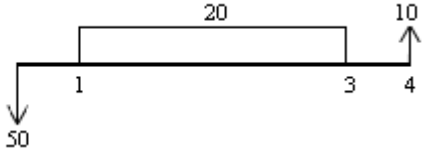
C

A



Incremental (C-B)

C-B



PW=-50 +20(P/A10,3)+10(P/F10,4)=$ 6.5671> 0

Select C

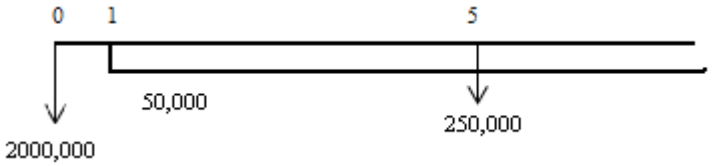
Incremental (A-C)

A-C

PW=-50+10(P/F10,2)+20(P/F10,3)+30(P/F10,4)=-6.21< 0

Select C

Ex.2 (74/275)



Solution

$P_w=C_w$

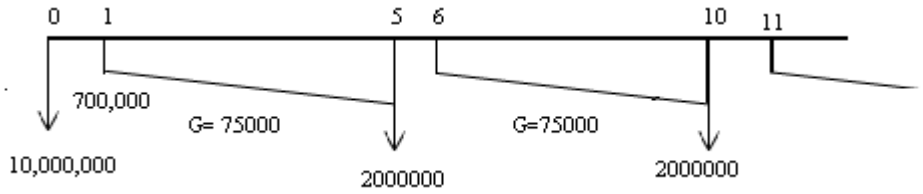
$C_w=A/i$

$C_w=50,000/0.10=$ \$ 500,000

$C_w=250,000(A/F10,5)/0.10=$ \$ 409,493.70

Total $C_w=2000,000 + 500,000+ 409,493.70=$ \$ 2909493.70

Ex.3 (72/275)



Determine the capitalized worth if i =4%.

Solution

C_W=[700,000 + 75000(A/G4,5)]/0.04 = $ 21,103018

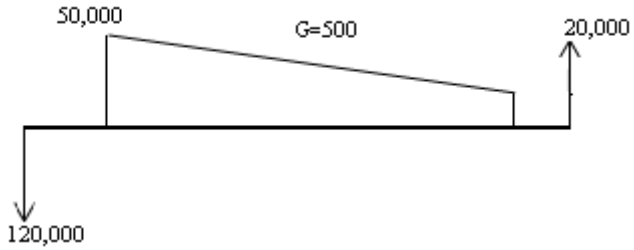
C_W= [2000,000(A/F4,5)/0.04=$ 9,231,500

Total C_w=10,000,000 +21,103018 + 9,231,500 = $ 40,334,376

Ex.4

An a investment of SR 120,000 for a new traffic count devices is being considering. Estimated salvage value of these is SR 20,000 at the end 8 year life. The initial income at the end first year is SR 50,000 and deceases by SR 500/ year over the first 7 year life of devices. If the money is worth 10% compounded annually, determine the external rate of return (EER)

Solution



(+) F_w(MARR) = (-)F_w(ERR)

(+) F_w(10%) = [50,000(P/A10,7)-500(P/G10,7)](F/P10,8) + 20,000 =$ 528115.37

(-)F_w(i)=120,000$(1+i)^8$

$$\frac{528115.37}{120{,}000} = (1 + i)^8$$

i= $0.203 \times 100 = 20.34\% >$ MARR

Attractive

Ex.5 (prob.54/390)

Consider the following cash flow profiles and assumed MARR a 10 present/year

EOY	0	1	2	3	4	5	6
NCF	-$100	$25	$200	-$100	$250	-$200	-$100

- Determine the ERR for this project.
- In this project economically attractive?

Solution

(+) Fw(MARR) = (-)Fw(ERR)

(+) Fw = 25(F/P 10,5) +200(F/P10,4) + 250(F/P 10,2) = $5.33

(-)Fw = $-100(1+i)^6 + 100(1+i)^3 +200 (1+i) + 100$

$5.33 = 100x^6 + 100x^3 + 200x + 100$

i=10.34> 10 %

Attractive

Ex.6

A crane is purchased for SR 510,100. The crane is expected to be of use the company for 6 year, after which it will be sold for SR 75000. Calculate the depreciation deduction and the resulting unrecovered investment during rach year of the assets life:

a. Use double declining balance depreciation.
b. Use sum of the year's digits depreciation.

Solution

P=510,000 n=6 years F=75,000

a. double declining balance

$\rho = \frac{2}{n} = 0.33$

$dt = \rho P(1- \rho)^{t-1}$

EOY	Dt	Bt
0	-	510,000
1	169983	340017
2	113327.7	226689.3
3	75555.56	151133.778
4	50372.89	100760.28
5	~~33583.6~~ 25760.89	~~67177.28~~ 75000
6	~~22390.19~~ 0	~~44787~~ 75000

b. sum of the year's digits

EOY	Dt	Bt
0	-	510,000
1	124285.7	385714.3
2	103571.4	282142.9
3	82857.14	199285.76
4	62142.85	137142.91
5	41428.57	95714.34
6	20714.285	75000

Homework

Chapter 5:12, 10

Chapter 6:7, 9, 31

Chapter 7: 4,5,28

Chapter 8: 51,52,69,71

Chapter 9: 9, 10