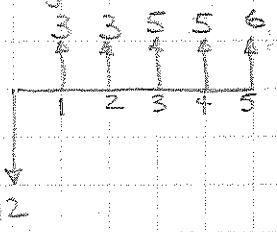
MAY 2003

QUESTION 1

(a) the Present Value of the cash flow if $x = 6$ & $y = 12\%$ quarterly compounding

0	1	2	3	4	5
-12	3	3	5	5	6



(1) Effective Annual Interest Rate = $I_a = \left(1 + \frac{r}{m}\right)^m - 1$ where R = APR, M = compounding period

$= \left(1 + \frac{.12}{4}\right)^4 - 1$

$= 0.1255$ OR 12.55%

(2) Calculate PE @ 12.55%

$PE(12.55) = -12 + A(P/A,i,N) + A(P/A,i,N)(P/F,i,N) + F(P/F,i,N)$

$= -12 + 3\left[\frac{(1.1255)^2 - 1}{(0.1255)(1.1255)^2}\right] + 5\left[\frac{(1.1255)^2 - 1}{(0.1255)(1.1255)^2}\right](1.1255)^{-2} + 6(1.1255)^{-5}$

$= -12 + 5.03374 + 6.62291 + 3.322218 = \boxed{\$2,978,834}$

(b) The value of X if the future value of the cash flow is 3,900,000 y = 12% annual

(1) CALCULATE FE OF KNOWN CASH FLOWS.

$FE = -12(F/P,i,N) + 3(F/A,i,N)(F/P,i,N) + 5(F/A,i,N) + X$

$3.9 = -12(1.17623) + 3(2.12)(1.2544) + 5(2.12) + X$

$3.9 = -2.569616 + X$

$X = 6.469616$ OR $\$6,469,616$

May 2003

Question 1

(c) The payback period if X = 9

(1) Calculate cumulatives

	A	Cum A
0	-12	-12
1	3	-9
2	3	-6
3	5	(-1)
4	(5)	+4
5	9	+13

$PBPA = 3^{PD}_{Yrs} + \frac{1}{5}$

$\boxed{PBPA = 3.2 \text{ yrs}}$

(d) Internal Rate of Return if X = 5

(1) Guess an interest rate say 14%

(2) Calculate PW (14%)

$PW(14\%) = -12 + A(P/A,i,N) + A(P/A,i,N)(P/F,i,N)$

$= -12 + 3(1.6467) + 5(2.3216)(0.77695)$

$= 1.872456$

TRY $PW(20\%) = -12 + 3(1.5278) + 5(2.1065)(0.6944)$

$= \$-102,832$

TRY $PW(18\%) = -12 + 3(1.5656) + 5(2.1743)(0.7182)$

$= \$+504,711$

Linear Interpolation: $i = 18\% + 2\%\left[\frac{504,711}{504,711 + 102,832}\right] = 19.66\%$

TRY $PW(19.66\%) = -12 + 3\left[\frac{(1.1966)^2 - 1}{(0.1966)(1.1966)^2}\right] + 5\left[\frac{(1.1966)^3 - 1}{(0.1966)(1.1966)^3}\right](1.1966)^{-2} =$

7.395139

$= \$-2568.29$

$\boxed{\text{IRR} = 19.66\%}$

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QUESTION 1

(e) The external rate of return if x = 5 and y = 10% yearly compounded

$$-12(F/P, ERR, 5) = 3(F/A, 10\%, 2)(F/P, 10\%, 2) + 5(F/A, 10\%, 3).$$

$$-12(1 + ERR)^5 = 3(2.10)(1.21) + 5(3.31)$$

$$(1 + ERR)^5 = 2.0144$$

$$1 + ERR = \log \frac{2.0144}{5} = 0.060829$$

$$ERR = 10^{0.060829} - 1$$

$$= 0.1503 \text{ or } 15.03\%$$

May 2003

QUESTION 3

(a) the book value of the equipment at the end of third year of the project.

n	B_{n-1}	D_n	B_n
1	18000	5400	12,600
2	12,600	3780	8820
3	8820	2646	6,174

Where: B_n = Book value

D_n = Depreciation

DO NOT INCLUDE WORKING CAPITAL IN DEPRECIATION

∴ Book value at the end of the 3RD YR = $6,174,000.00

(b) The before tax cash flow in the current fiscal YEAR L=300,000

Revenues	8,650
Expenses	
Labor	2,100
Material	1,600
OVERHEAD	1,260
CCA	
Taxable Income	
Income Tax (45%)	
Net Income	

Operating Activities
Net Income:
CCA

Investing Activities
Investment:
Working Cap: