FM Assignment 2

$$20000 = 427.90 \quad a_{\overline{60}|} @ \frac{i^{(12)}}{12}$$

$$\Rightarrow \frac{20000}{427.90} = \frac{1 - v^{60}}{i^{(P)}}$$

$$\Rightarrow 46.7399 = \frac{1 - (1+i)^{-60}}{i}$$

$$i = 10.79\%$$

$$1+i = \left[1 + \frac{i^{(12)}}{12}\right]^{12}$$

$$\frac{i^{(12)}}{12} = 0.008583$$

$$i^{(12)} = 10.2996\%$$

2) a. Usually the net cash flow changes from negetive to positive only once. In this, the balance in the investors account will change from negetive to positive at a unique time 't', or it will always be negetive in which case the project is not viable. If time 't' exists it is called the discounted payback period.

b. Usually the net cash flow changes from negetive to positive only once. In this the balance in the investor account will change at unique time 't'. It is the smallest value of 't' such that $A(t) \geq 0$ where $A(t) = \sum_t C_s (1+j)^{(t-s)} + \int_0^t p(s)(1+j1)^{(t-s)} ds$ where j = rate of interest applicable to investors borrowings. The payback period of a project is found by counting the number of years it takes before the cumulative forecasted cash flow equals the initial investment.

ii) Net Present value is calculated is terms of currency while discounted payback period or payback period refer to the period of time required for the return on an investment to repay the total initial investment.

Net Present value provides better decisions than payback methods as it is more accurate and efficient because it uses cash flow not earnings. It also considers time value and gives a direct mesure of the currency benefit on the present value basis of the project.

iii) Project A

$170000 = 20000(1+i)^{-1} + 20000(1+i)^{-2} + 20000(1+i)^{-3} - 20000(1+i)^{-1} - 10000(1+i)^{-2}$.

$170000 = 10000(1+i)^{-2} + 20000(1+i)^{-3}$

$i = 0.07424$

$i = 7.424\%$

Project B

$20000 = 14000\, a_{\overline{6}|}^{@i}$

$20000 = 14000 \left[\frac{1-(1+i)^{-6}}{i}\right]$

$\frac{100}{7} = \left(\frac{1-(1+i)^{-6}}{i}\right)$

$i = 7\%$.

b) Project A $= -170000 - 20000(1.06)^{-1} - 10000(1.06)^{-2}$.
$+ 20000(1.06)^{-1} + 20000(1.06)^{-2} + 20000(1.06)^{-3}$

$= -170000 + 10000(1.06)^{-2} + 20000(1.06)^{-3}$

$= 6823.82$

Project B $= -20000 + 14000\, a_{\overline{6}|}^{@6\%} + 20000(1.06)^{-6}$

$= 9834.65$.

classmate

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3) Annuity 1 $= 200(v)^{1/4} \; a_{\overline{22}|}^{(4)}$ @8% $= 2161.363$

Annuity 2 $= 320(1+i)^{1/12} \; a_{\overline{16}|}^{(4)}$ @8% $= 2997.872$

Annuity 3 $= 180 \; a_{\overline{18}|}^{(12)}$ @8% $= 1780.665$

Total $= 6899.90$

$6899.90 = A(1+i)^{1/4}\left(a_{\overline{21.5}|}^{(2)}\right)$

$A = 656.56$

5) Time weighted rate of return $= \dfrac{16.6}{12.6} - 1 = 0.3226 = 32.26\%$

Time weighted rate of return $= \dfrac{15.5}{12.1} - 1 = 28.10\%$

a) $1240(1+i) + 1310(1+i)^{3/4} + 1680(1+i)^{1/2} + 1550(1+i)^{1/4}$

$i = 29.32\%$

b) $400\left[\ddot{s}_{\overline{1}|}^{(4)}\right] = 100(16.6)\left[\dfrac{1}{12.4} + \dfrac{1}{13.1} + \dfrac{1}{14.8} + \dfrac{1}{15.8}\right]$

$\Rightarrow$ ~~$i = 7.088\%$~~. $i = 29.8\%$.

a) $121(1+i) + 920(1+i)^{3/4} + 9030(1+i)^{1/2} + 1310(1+i)^{1/4} = 4(1550)$

$i = 67.5\%$

b) $400\left[\ddot{s}_{\overline{1}|}^{(4)}\right] = 100(15.5)\left[\dfrac{1}{12.1} + \dfrac{1}{9.2} + \dfrac{1}{10.3} + \dfrac{1}{13.1}\right]$

$400(1.4135)$ ~~$= 1501$~~ $\Rightarrow i = 7.088\%$.

6) $160000 = x \; a_{\overline{10}|}$ @8%

$x = 23844.65$

Loan outstanding after 4th payment

$23844.65\left[a_{\overline{6}|}\right.$ @8%$\left.\right] = 110231.64$

~~$x\,a_{\overline{6}|} = 110231.64$~~

Loan ~~outstanding~~ after 7^{th} payment

$25307.72 \left[a_{\overline{37}|}^{@10\%}\right] = 62942.79$

$x\, a_{\overline{37}|}^{@9\%} = 62942.79$

$x = 24869.77$

yield $= 16000 + 1465\, a_{\overline{20}|} - 443.95\, (a_{\overline{7}|}] - 24865.72\, (a_{\overline{10}|}] = 0.$

$i = 8.4\%.$

8), -

12) Explained in question 2

ii) $DPP = -800(1+i)^{t} - 50(1+i)^{t-1} + 100\,(s_{\overline{12}|} @ i\%) = 0$

$t = \cancel{175}\ 17.8$ years

$AV = 100\, s_{\overline{10}|}^{@6\%} = 480$

$AV = 480000$

13 i) $x\, a_{\overline{25}|}^{(12)} @ 7\% = 9880$

$x = 821.76.$

ii) Loan outstanding after 10/03/29.

$x\, a_{\overline{n}|}^{(16)} @ 7\% = 648600$

iii) Loan outstanding after 10/9/26 $= x\, a_{\overline{83/6}|}^{(12)} @ 7\%$

Capital repaid $= x \left[\dfrac{v^{13.75} - v^{83/6}}{i^{(12)}}\right] @ 7\% = 26.86$

iv) Capital repayment continued in 12 installments is

$x\, a_{\overline{22/3}|}^{(12)} - a^{(12)}_{\overline{19/3}|} @ 7\% = 516.2.$

Total interest $= X - 516.20 = 305.56.$