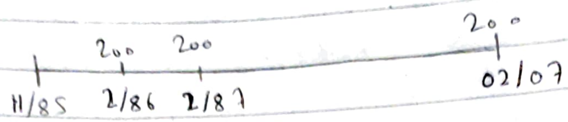
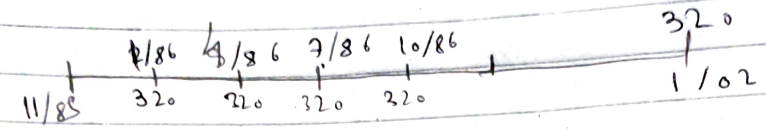
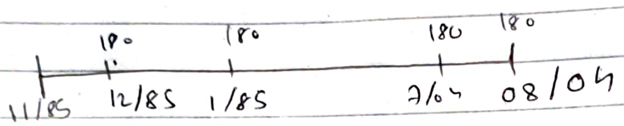
3)



Annuity 1 $= 200(v)^{1/4}(\ddot{a}_{22} @ 8\%) = 2161.363$



Annuity 2 $= 320(1+i)^{1/12}(a^{(4)}_{\overline{16.25}|} @ 8\%) = 2957.872$



Annuity 3 $= 180(a^{(12)}_{\overline{18.75}|} @ 8\%) = 1780.665$

Total $= 6899.90$

$\therefore 6899.90 = A(1+i)^{1/4}(a^{(2)}_{\overline{21.5}|})$ or $\boxed{A = 656.56}$

5) i) TWRR $= \frac{16.4}{12.4} - 1 = 0.3226 = 32.26\%$

TWRR of equity fund $= \frac{15.5}{12.1} - 1 = \boxed{28.10\%}$

ii) a) $1240(1+i) + 1310(1+i)^{3/4} + 1480(1+i)^{1/2} + 1580(1+i)^{1/4} = 4 \times 1640$

$i = 29.32\%$

b) $400 \times \ddot{s}^{(4)}_{\overline{1}|} = 100(16.4)\left(\frac{1}{12.4} + \frac{1}{13.1} + \frac{1}{14.8} + \frac{1}{15.8}\right)$ $\ddot{s}^{(4)}_{\overline{1}|} = 1.1801$

$i = 29.8\%$

iii) a) $1210(1+i) + 920(1+i)^{3/4} + 1030(1+i)^{1/2} + 1310(1+i)^{1/4} = 4 \times 1550$

$i = 67.5\%$

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

$\ddot{s}^{(4)}_{\overline{1}|} = 1.4135$ $i = 70.88\%$

6) i) $160000 = X a_{\overline{10}|} @ 8\%$ $\quad \boxed{X = 23844.65}$

ii) Loan o/s after 4th Pay =

$23844.65 (a_{\overline{6}|} @ 8\%) = 110231.44$

$\therefore Y a_{\overline{7}|} = 110231.44 \quad Y = 25309.72$

iii) Loan o/s after 7th Pay =

$25309.72 (a_{\overline{3}|} @ 10\%) = 62942.74$

$\therefore Z a_{\overline{3}|} @ 9\% = 62942.74 \quad Z = 24865.77$

$\therefore$ yield $\Rightarrow$

$160000 + 1465 (a_4) - 443.95 (a_7) - 24865.72 (a_{10}) = 0$

$\therefore \; i = 8.4\%$

8) i) $PV = 2.7 + 0.2 a_{\overline{3}|} @ i\%$ ——— (i)

$0.1 v^3 + \bar{a}_{\overline{10}|} (0.25v + 0.2v^2 + 0.1v^3) @ i\%$ ——— (ii)

$\therefore$ (i = ii) $\quad i = 9.28\%$

ii) $0.1 v^3 + 0.85 \bar{a}_{\overline{10}|} v^3$

$= (0.1 v^3 + 0.85 \bar{a}_{\overline{10}|} v^3 - 2.7 - 0.2 a_{\overline{3}|}) @ \cancel{10\%}$ (i = 10%) $= \cancel{+}0$

$\therefore = 4.19 - 3.19 = \boxed{1.0089}$

as NPV is +ve, its good to invest (Ans)

11) i) TWRR $\Rightarrow (1+i)^2 = \frac{500}{460}\left(\frac{\cancel{565}\ 550+50}{500+40}\right)\left(\frac{x}{550}\right) = 1.44$

$x = 655.78$

ii) MWRR $\Rightarrow 460(1+i)^2 + 40(1+i)^{7/4} - 50(1+i)^{1/3} = 655.78$

MWRR $= 19.85\%$

iii) $460(1+i) + 40(1+i)^{3/4} = 600$ $i = 20.445\%$

$(1+i) = \frac{655.78}{550} = 1.1923$

$\therefore$ LIRR $= (1+i)^2 = 1.1923(1.2044) = 19.83\%$

12) i) a) DPP $\Rightarrow -800(1+i)^t - 50(1+i)^{t-1} + 10(\bar{s}_{t-2} @ 7\%) = 0$

~~$t = 17.8\%$~~ $t = 17.8$ yr

b) AV $\Rightarrow 100(\bar{s}_{4.23} @ 6\%) = 480$ $\therefore$ AV $= 480000$

iii) $i = 6\%$ $100\,\bar{s}_{1} = 102.971$

$\therefore$ DPP $\Rightarrow -800(1+i)^t - 50(1+i)^{t-1} + 102.97\, s_{\overline{t-2}|} @ 7\% = 0$

$t = 18$ yr

$\therefore -800(1+i)^{18} - 50(1+i)^{17} + 102.97\, s_{\overline{16}|} @ 7\% = 9.2714$

$\therefore$ AV $= 9.2714(1+i)^4 + 100\,\bar{s}_{\overline{4}|} @ 6\% = 462.79$

~~AV = 7~~ AV $= 462790$ (Ans)

13) i) $X a^{(12)}_{\overline{25}|} @ 7\% = 9880$

$X = 821 \cdot 26$

$\frac{X}{12} = 68 \cdot 48$
$= 6848$

ii) Loan o/s after 10/03/29

$X a^{(12)}_{\overline{34/3}|} @ 7\% = 64860$

iii) Loan o/s after 10/9/26 $\Rightarrow X a^{(12)}_{\overline{83/6}|} @ 7\%$.

" " " 10/10/26 $\Rightarrow X a^{12}_{\overline{13.75}|} @ 7\%$.

$\therefore$ Capital repaid $= X \left(\frac{v^{13.75} - v^{83/6}}{i^{2}} \right) @ 7\%. = 26.86$

iv) Capital repay continue in 12 installment is

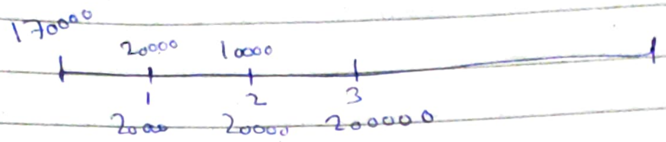
$X \left(a^{12}_{\overline{22/3}|} - a^{12}_{\overline{19/3}|} \right) @ 7\%. = 316.2$

Total interest $= X - 316.20 = 305.56$

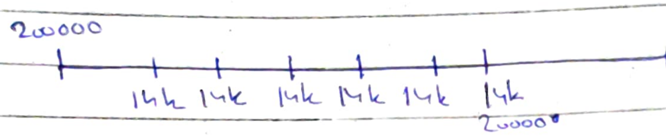
iii) ~~$427.90\, S_{\overline{12}|} @ 0.8583$~~

$427.90 \times 12 + 274.49 \times 48 = 18310.32$

2) iii) a)



b)



~~Value (6) = 170000~~

a) $170000 = 20000\cancel{(1+i)^{-1}} + 2000(1+i)^{-2} + 200000(1+i)^{-3} - 20000\cancel{(1+i)^{-1}}$
$- 10000(1+i)^{-2}$

$170000 = 10000(1+i)^{-2} + 200000(1+i)^{-3}$

$i = \cancel{0.04}\ 0.07424 = 7.424\% = i$

b) $200000 = 14000\, a_{\overline{6}|} @ i\% = 14000\left(\frac{1-(1+i)^{-6}}{i}\right)$

$\frac{100}{7} = \frac{1-(1+i)^{-6}}{i} = 14.285714$

$\cancel{100i}\ 7 - 7(1+i)^{-6} - 100i = 0$

$200000 = 14000\, a_{\overline{6}|} @ i\% + 200000(1+i)^{-6}$

$200 = 14\left(\frac{1-(1+i)^{-6}}{i}\right) + 200(1+i)^{-6}$

$200i = 14 - 14(1+i)^{-6} + 200i(1+i)^{-6}$

$i = 7\%$

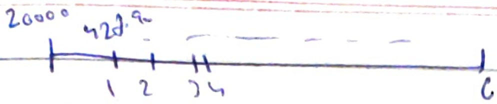
2b) Project A $\quad -170000 - 2000\cancel{(1.06)^{-1}} - 10000(1.06)^{-2} + 20000\cancel{(1.06)^{-1}} + 20000(1.06)^{-2}$
$+ 200000(1.06)^{-3}$

$= -170000 + 10000(1.06)^{-2} + 200000(1.06)^{-3} \quad 6823.82$

Project B $\quad -200000 + 14000\, a_{\overline{6}|} @ 6\% + 200000(1.06)^{-6}$

$= 14\left(\frac{1-1.06^{-6}}{0.06}\right) \quad = 9834.65$

1)



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

$= '' \left(\frac{1-(1+i)^{-60}}{i} \right)$

$46.73989 = \frac{1-(1+i)^{-60}}{i}$

$i = \frac{i^{12}}{12} = 0.008583 = 0.8583\%$

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

$i^{12} = 10.2996\%$

$i = 10.79\%$

~~ii) $i = 10.79\% = 10.8\%$~~ ~~amount annuity amount = 274.49~~

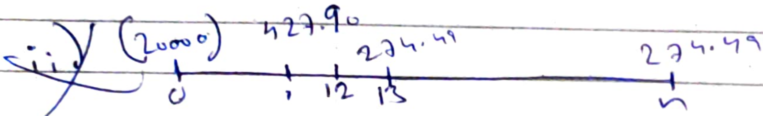
~~$20000 = 274.49\, a^{(12)}_{\overline{n}|} @ i\%$~~

~~$20000 = '' \left(\frac{1-(1+i)^{n}}{i^{12} = 10.2996\%} \right) = 274.49 \left(\frac{1-(1.1079)^{-4}}{\cancel{10}\ 0.102996} \right)$~~

~~$(1.01079)^{-n} = 6.50453568$~~

$-n \ln 1.01079 = \ln 6.50453584$

~~ii)~~



~~2000~~ Capital left after 1yr $= 427.90\, a_{\overline{12}|} @ 0.008583$

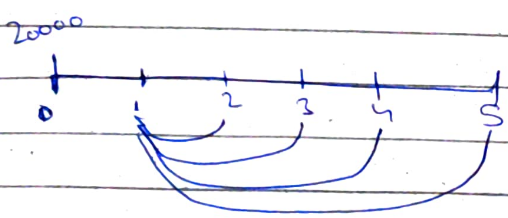
$= 427.90 \left(\frac{1 - 1.008583^{-12}}{0.008582} \right)$

~~ii)~~ $20000 = 5134.8\, a^{12}_{\overline{1}|} @ i$

$= '' \left(\frac{1 - 1.1079^{-1}}{0.102996} \right)$

$427\, a_{\overline{12}|} @ 0.008583$

ii)



$20000 (1.1079) - \cancel{12(4}$

$5134.8\, s^{12}_{\overline{1}|} @ 10.8\%$

$5134.8 \left(\frac{1.108^{+1} - 1}{0.102996} \right)$

$\therefore$ capital left after 1yr $= 5134.8\, a^{12}_{\overline{4}|} @ 10.8\%$

$= 16775.98$

$16775.98 = 274.49\, a^{12}_{\overline{t}|} @ 10.8\% \times 12$

$'' = 12 \times '' \left(\frac{1 - \cancel{(1+i)}\,(1.108)^{-t}}{0.102996} \right)$

~~5.294797028~~ $0.4754 = (1.108)^{-t}$

$t = 7.25\text{yr}$