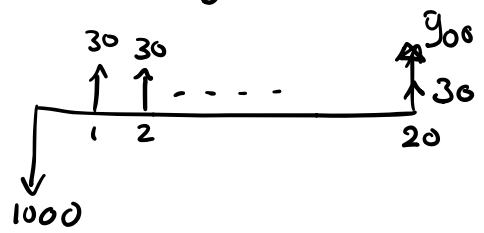
Ahmed Assem Hassan 2101493

(1) Semi Annual payment = 0.03 x 1000 = 30 $



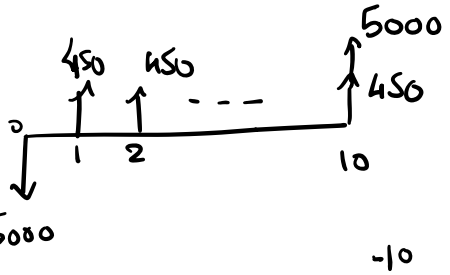
$(1 + i_{6m})^2 = (1+0.1) \rightarrow i_{6m} = 0.0488$

$P = 30\left[\frac{1-(1.0488)^{-20}}{0.0488}\right] + \frac{900}{(1.0488)^{20}} = 724.75\ \$$

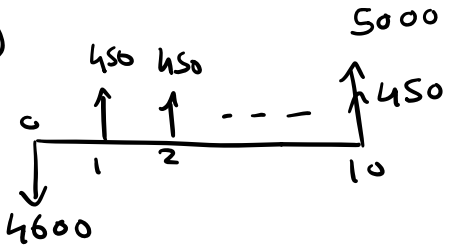
(2)

Annual payment = 0.09 x 5000 = 450 $

(a)



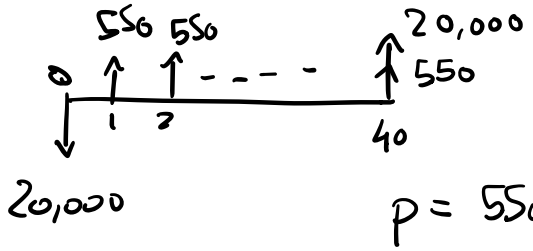
(b)



(a) $P = 450\left[\frac{1-(1.1)^{-10}}{0.1}\right] + \frac{5000}{(1.1)^{10}} = 4692.7\ \$$

(b) $4600 = 450\left[\frac{1-(1+i)^{-10}}{i}\right] + \frac{5000}{(1+i)^{10}} \rightarrow \therefore i = 10.32\%$

(3) 3 months payment = 0.0275 x 20,000 = 550 $

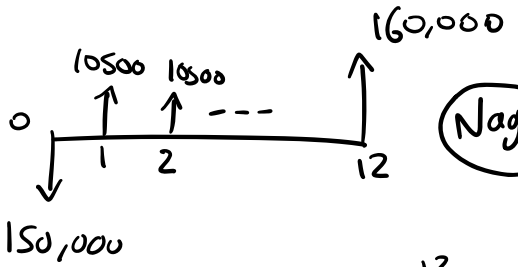


$(1+i_{3m})^4 = (1.1) \rightarrow i_{3m} = 2.4\%$

$P = 550\left[\frac{1-(1.024)^{-40}}{0.024}\right] + \frac{20,000}{(1.024)^{40}} = 21787.16\ \$$

He can buy this Bond for 21,787.16 $ at MARR 10%.

④ Semi annual payment = $0.07 \times 150{,}000 = 10{,}500$ EGP

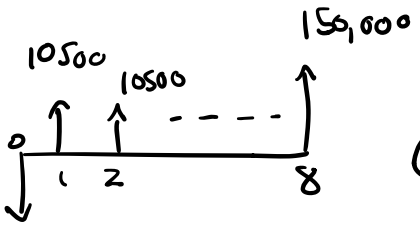


Nagy

$$150{,}000 = 10500\left[\frac{1-(1+i_6)^{-12}}{i_6}\right] + \frac{160000}{(1+i_6)^{12}}$$

$i_6 = 0.0736 \rightarrow (1+i_6)^2 = 1+i$

$\therefore i_{nagy} = 15.27\%$



Sameh

$$160{,}000 = 10{,}500\left(\frac{1-(1+i_6)^{-8}}{i_6}\right) + \frac{160000}{(1+i_6)^{8}}$$

$i_6 = 0.0593 \rightarrow (1+i_6)^2 = 1+i$

$\therefore i_{Sameh} = 12.21\%$

⑤ $F_C = 25{,}000$ EGP

$v = 50+50 = 100$ EGP

$r = 150$ EGP

$$Q_{BE} = \frac{F_C}{r-v} = \frac{25\,000}{50}$$

$\therefore Q_{BE} = 500$ units per month

⑥ $F_C = 2000$ EGP

$V = 0.05$ EGP

$r = 0.1$ EGP

$$Q_{BE} = \frac{F_C}{r-v} = \frac{2000}{0.1-0.05}$$

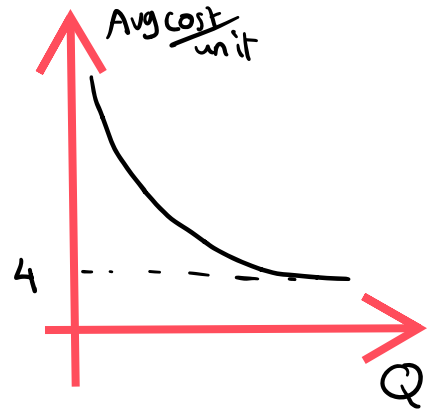
$\therefore Q_{BE} = 40{,}000$ units per month

⑦ avg cost/unit $= \frac{TC}{Q} = \frac{FC}{Q} + v$, To make unit cost = 5$

(a) $5 = \frac{160{,}000}{Q} + 4 \rightarrow Q = 160{,}000$ unit

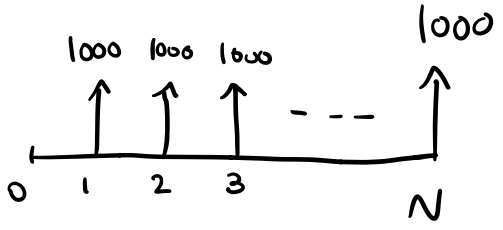
(b) $FC = 200{,}000\$$

$\therefore$ avg cost/unit $= \frac{200{,}000}{Q} + 4$

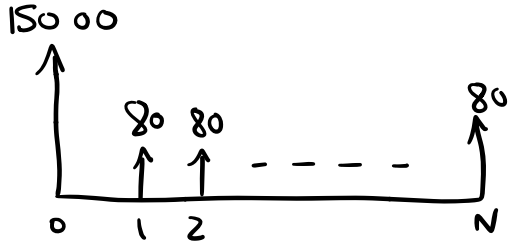


(8)

(A)



(B)



@ Break even

$$P_A = P_B \rightarrow 1000\left(\frac{1-(1.005)^{-N}}{0.005}\right) = 15{,}000 + 80\left(\frac{1-(1.005)^{-N}}{0.005}\right)$$

$\therefore N = 17.05 \simeq 17$ months to Break even

(9) a) $TC = R \rightsquigarrow Q_{BE}$

$$0.001Q_{BE}^2 + 3Q_{BE} + 2 = 25Q$$

$$0.001Q_{BE}^2 - 22Q_{BE} + 2 = 0$$

$Q_{BE} = 22000$ units or $Q_{BE} = 0.091$ unit refused

b) Profit $= R - TC$

@ $Q = 10{,}000$

$P = 25Q - (0.001Q^2 + 3Q + 2)$

$\therefore P = 119999$

(10)

a) $d = 1 - \left(\frac{S}{B}\right)^{1/n} = 1 - \left(\frac{1100}{5000}\right)^{1/8} = 17.24\%$

b) $BV_4 = B(1-d)^4 = 2345.6\ \$$

c) $D_6 = Bd(1-d)^{6-1} = 334.66\ \$$

(11) $BV_5 = B(1-d)^5$

$3,500 = 8000\,(1-d)^5 \longrightarrow d = 0.152$

a) $d = 1 - (S/B)^{\frac{1}{n}}$

$0.152 = 1-(S/8000)^{\frac{1}{8}} \longrightarrow S = 2,139\ \$$

b) $BV_7 = 8000(1-0.152)^7 = 2,522.7\ \$$

c) $D_3 = Bd(1-d)^{3-1} = 874.4\ \$$

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(12) $d = 1(S/B)^{\frac{1}{n}} = 1-(3000/13000)^{\frac{1}{8}}$

$d = 0.2$

a) $D_m = \frac{(B-S)}{n} = 1250\ \$ = D_4$

b) D_4 using DB $= Bd(1-d)^{4-1} = 1229\ \$$

c) $BV_4 = B-4 \times D_m = 7000\ \$ =$ BV at beggin. of 5^{th} year

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(13) a) $d = 1-(S/B)^{\frac{1}{n}} = 0.25$

b) BV at beggin. of 6^{th} year $= BV_5$

$BV_5 = B(1-d)^5 = 47,461\ LE$

c) $D_4 = Bd\,(1-d)^{4-1} = 21,094\ LE$

(14) a) $D_5 = \left[\frac{n-5+1}{SYD}\right] \times B$

$\because SYD = \frac{1}{2} \times n \times (n+1) = 120$

$\therefore \quad D_5 = 11{,}000 \text{ LE}$

b) $D_1 + D_2 + D_3 + D_4 + D_5 = \frac{B}{SYD}(15+14+13+12+11)$

$= 65{,}000$

$\therefore BV_5 = B - \sum_{m=1}^{5} D$ $= 55{,}000$

↳ BV at beggin. of 6th year

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(15) $\because g = \frac{1331-1210}{1210} = 0.1 = 10\% \longrightarrow i \neq g$

$P_1 = 1000\left(\frac{1-\left(\frac{1+0.1}{1+0.15}\right)^{10}}{0.05}\right) = 7177.33\$$

$\therefore P = \frac{7177.33}{(1.15)} = 6241.2\$$