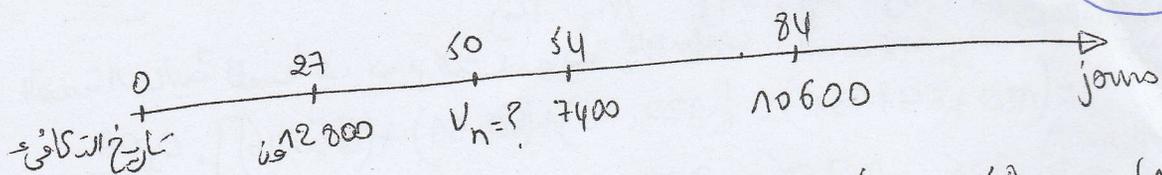


حل 16

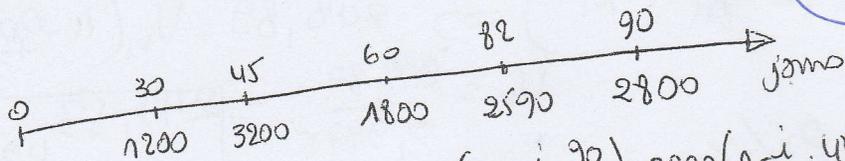
7



$$V_n \left(1 - \frac{0.09 \cdot 50}{360}\right) = 12800 \left(1 - \frac{0.09 \cdot 27}{360}\right) + 7400 \left(1 - \frac{0.09 \cdot 54}{360}\right) + 10600 \left(1 - \frac{0.09 \cdot 84}{360}\right)$$

$$\Rightarrow V_n = 30775.80 \text{ UM}$$

حل 17



$$1200 \left(1 - \frac{i \cdot 30}{360}\right) + 1800 \left(1 - \frac{i \cdot 62}{360}\right) + 2800 \left(1 - \frac{i \cdot 90}{360}\right) = 3200 \left(1 - \frac{i \cdot 45}{360}\right) + 2590 \left(1 - \frac{i \cdot 82}{360}\right)$$

$$i = 0.0908 \quad i = 9.08\%$$

حل 18

$$V_{n1} = V_{n2} = V_{n3} = V_n$$

$$1488 = 300 + V_n \left(1 - \frac{0.06 \cdot 1}{12}\right) + V_n \left(1 - \frac{0.06 \cdot 2}{12}\right) + V_n \left(1 - \frac{0.06 \cdot 3}{12}\right)$$

$$1488 - 300 = V_n \left[\left(1 - \frac{0.06 \cdot 1}{12}\right) + \left(1 - \frac{0.06 \cdot 2}{12}\right) + \left(1 - \frac{0.06 \cdot 3}{12}\right)\right]$$

$$1188 = V_n [0.995 + 0.99 + 0.985] \quad V_n = \frac{1188}{2.97} \quad V_n = 400 \text{ UM}$$

حل 19

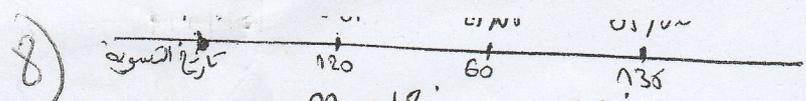
- $n = 45 = 05/26 \leftarrow 04/11$ من V_{n3}
- $n_1 = 60 = 06/10 \leftarrow 04/11$ من V_{n1}
- $n_2 = 80 = 06/30 \leftarrow 04/11$ من V_{n2}
- $n_3 = 95 = 07/18 \leftarrow 04/11$ من V_{n3}

$$V_n \left(1 - \frac{i \cdot n}{360}\right) = 2000 + 4600 \left(1 - \frac{i \cdot n_1}{360}\right) + 6400 \left(1 - \frac{i \cdot n_2}{360}\right) + V_{n3} \left(1 - \frac{i \cdot n_3}{360}\right)$$

$$18840 \left(1 - \frac{0.05 \cdot 45}{360}\right) = 2000 + 4600 \left(1 - \frac{0.05 \cdot 60}{360}\right) + 6400 \left(1 - \frac{0.05 \cdot 80}{360}\right) + V_{n3} \left(1 - \frac{0.05 \cdot 95}{360}\right)$$

$$16722.25 = 10890.56 + V_{n3} \left(1 - \frac{0.05 \cdot 95}{360}\right)$$

$$V_{n3} = 5909.66 \text{ UM}$$



$m_1 = 18$ $m_2 = 31$ $m_3 = 46$
 $18 = 8 + 2030$ $27 + (2030)$ $5 + 34(2030)$

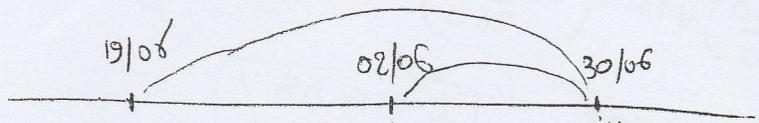
القيمة الحالية للسندات يوم التسوية
 $= (120 + 60 + 135) - [(120 \cdot 18) + (60 \cdot 31) + (135 \cdot 46)] \cdot \frac{0,06}{360}$
 $= 315 - 1,705 = 313,29$

قيمة ما يدفع نقدًا = $\frac{313,29}{3} = 104,43$

القيمة الحالية للسند الجديد = $104,43 - 313,29 = 208,89$

$V_0 = V_n(1 - i)^n \Rightarrow 208,89 = V_n(1 - \frac{0,06 \cdot 75}{360})$
 $V_n = \frac{208,89}{0,9875} = 211,53$

$20/04 \rightarrow 05/06$
 $(30 \cdot 20) + 31 + 25$
 $70 + 31$



حل 15

- $n_1 = 30 + 12 = 42$
- V_{a1}
- EC_1
- $i = 9,2\%$

- $n_2 = 30 - 2 = 28$
- V_{a2}
- EC_2
- $i = 9,6\%$

$V_{n1} + V_{n2} = 85000$

$V_{a1} + V_{a2} = V_{a1} + V_{a2}$
 $\Rightarrow V_{n1} \left(1 - \frac{0,092 \cdot 42}{360}\right) + (85000 - V_{n1}) \left(1 - \frac{0,096 \cdot 28}{360}\right) = V_{n1} \left(1 - \frac{0,095 \cdot 42}{360}\right) + (85000 - V_{n1}) \left(1 - \frac{0,092 \cdot 28}{360}\right)$

$V_{n1} = 34000,0195$

$V_{n1} \left(1 + \frac{0,092 \cdot 42}{360}\right) + 85000 - V_{n1} - (85000 - V_{n1}) \cdot \frac{0,096 \cdot 28}{360}$
 $= V_{n1} \left(1 - \frac{0,095 \cdot 42}{360}\right) + 85000 - V_{n1} - (85000 - V_{n1}) \cdot \frac{0,092 \cdot 28}{360}$

$V_{n1} - \frac{0,092 \cdot 42}{360} V_{n1} + (85000 - V_{n1}) - (85000 - V_{n1}) \left(\frac{0,096 \cdot 28}{360}\right) = V_{n1} - V_{n1} \frac{0,095 \cdot 42}{360}$
 $+ (85000 - V_{n1}) - (85000 - V_{n1}) \left(\frac{0,092 \cdot 28}{360}\right)$
 $V_{n1} - \frac{0,092 \cdot 42}{360} + 85000 - V_{n1} - \frac{0,096 \cdot 28}{360} = V_{n1} - \frac{0,095 \cdot 42}{360} + 85000 - V_{n1} - \frac{0,092 \cdot 28}{360}$

09

$E \wedge 21$

$$V_{n1} = V_{n2} - 1944 \quad (1)$$

$$V_{m2} = V_{n1} + 1944$$

$$V_{n1} = V_{m2} - 1944$$

$$V_{m3} = V_{n2} + 9720 \quad (2)$$

$$E_{c1} = \frac{V_{n1} i_1 h}{360} = \frac{(V_{n2} - 1944) \cdot 0,05 h}{360} \quad (3)$$

$$E_{c3} = \frac{V_{m3} i_3 h}{360} = \frac{(V_{n2} + 9720) \cdot 0,03 h}{360} \quad (4)$$

$$(3) = (4) \Rightarrow \frac{(V_{n2} - 1944) \cdot 0,05 h}{360} = \frac{(V_{n2} + 9720) \cdot 0,03 h}{360}$$

$$(V_{n2} - 1944) \cdot 0,05 h = (V_{n2} + 9720) \cdot 0,03 h$$

$$0,05 h V_{n2} - 97,20 h = 0,03 h V_{n2} + 291,60 h$$

$$h(0,05 V_{n2} - 97,20) = h(0,03 V_{n2} + 291,60)$$

$$0,05 V_{n2} - 97,20 = 0,03 V_{n2} + 291,60$$

$$0,02 V_{n2} = 388,80 \quad (5) \quad \boxed{V_{n2} = 19440 \text{ DA}}$$

$$V_{m1} = 19440 - 1944 = \boxed{17496 \text{ DA}}$$

$$V_{m3} = 19440 + 9720 = \boxed{29160 \text{ DA}}$$

الحل الثاني

$$E_1 = E_2 \Rightarrow \frac{V_{n1} i_1 h}{360} = \frac{V_{n2} i_2 h}{360}$$

$$17496 \cdot 0,05 = 19440 \cdot i_2 \Rightarrow i_2 = \frac{17496 \cdot 0,05}{19440} = 0,045 = \boxed{4,5\%}$$

$$\Sigma E_c = E_{c1} + E_{c2} + E_{c3} = \frac{1}{100} V_{n2} = \frac{19440}{100} = 194,40 \text{ DA}$$

الفائدة الكلية
للرصيد الأول

$$V_{01} = 17496 + 19440 + 29160 - 194,40 = 65901,60$$

$$V_{01} = V_n \left(1 - \frac{i m_1}{360}\right) + V_n' \left(1 - \frac{i m_2}{360}\right) = 65901,60$$

$$65901,60 = V_n \left[1 - \frac{0,04 \cdot 60}{360}\right] + \left[1 - \frac{0,04 \cdot 120}{360}\right]$$

$$\boxed{V_n = 33283,64}$$

10

$i = 7\%$ $n = 4$ سنوات : حل 29

سنة	التمويل	قيمة التكلفة	القيمة في نهاية السنة	مصلحة الصلح	الفوائد السنوية	رأس المال بداية السنة	النوات
1	a	a	a(1+i)	12840	840	12000	1
2	a(1+i)	a(1+i) i	a(1+i) + a(1+i) i	13738,8	898,8	12840	2
3	a(1+i) ²	a(1+i) ² i	a(1+i) ² + a(1+i) ² i	14709,516	961,716	13738,8	3
n	a(1+i) ⁿ⁻¹	a(1+i) ⁿ⁻¹ i	a(1+i) ⁿ⁻¹ + a(1+i) ⁿ⁻¹ i	15729,552	1029,036	14709,516	4

$I = 5400 = 20000$: حل 23

$A = 28466,25 = 20000(1+0,04)^n \Rightarrow (1+0,04)^n = \frac{28466,25}{20000} = 1,4233125$

$I = 5400 = 20000 \cdot i \cdot n \Rightarrow i_{simple} = \frac{5400}{20000 \cdot 9} = 3\%$

$A_4 = 134793,6 = a(1+i)^4$: حل 24

$A_6 = 156496,2 = a(1+i)^6 = a(1+i)^4(1+i)^2$

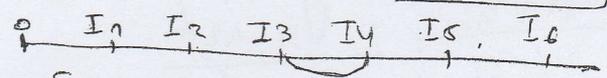
$\Rightarrow A_6 = A_4(1+i)^2 \Rightarrow 156496,2 = 134793,6(1+i)^2$

$\Rightarrow (1+i)^2 = \frac{156496,2}{134793,6} = 1,1610 \Rightarrow 1+i = \sqrt{1,1610} = 1,0775$

$\Rightarrow i = 0,0775 \quad i = 7,75\%$

$A_6 = a(1+i)^6 \Rightarrow 156496,2 = a(1,0775)^6 \Rightarrow a = \frac{156496,2}{(1,0775)^6}$

$a = \frac{156496,2}{1,5649} \Rightarrow a = 100000$



حل 25

1) $I_1 = a[(1+i)^n - 1] = a[1+i - 1] = ai = 72800 \cdot 0,095$
 $I_1 = 6916$

2) $I_4 = A_3 \cdot i = [a(1+i)^3] i = [72800(1,095)^3] \cdot 0,095$
 $I_4 = 9080,24$

or $I_4 = A_4 - A_3 = 104661,7772 - 95581,4769$

3) $A_6 = a(1+i)^6 = 72800(1,095)^6 \Rightarrow A_6 = 125492,0158$

حل 26

- * $A_a = 500000(1+0,12)^4 = 786789,68$
- * $A_s = 500000(1+0,06)^{4 \times 2} = 796924,0373$
- * $A_T = 500000(1+0,03)^{4 \times 4} = 802353,2196$

كلما كانت مدة التوظيف أقل كلما كانت القيمة أكبر

العقائبة:

11)

$$A_{m=m+p} = a(1+i)^m \left[1 + i \frac{P}{12} \right]$$

$$= 54200 (1+0,095)^4 \left(1 + 0,095 \cdot \frac{7}{12} \right)$$

$$= 54200 (1,437661) (1,05437) = \underline{82239,35799}$$

الدين العلقوف

$$A_{n=m+p} = a(1+i)^m (1+i)^{p/12}$$

$$= a(1+0,095)^4 (1+0,095)^{7/12} = 54200 (1,437661) (1,05437) = \underline{82239,35799}$$

النسب

$$A_{n=m+p} = a(1+i)^m + \frac{P}{12} \left[a(1+i)^{m+1} - a(1+i)^m \right]$$

$$= 54200 (1+0,095)^4 + \frac{7}{12} \left[54200 (1+0,095)^5 - 54200 (1+0,095)^4 \right]$$

$$= 54200 (1,437661) + \frac{7}{12} [1,574239 - 1,437661] = \underline{82239,36}$$

حل 28

$$A_1 = a_1 (1+i_1)^n \Rightarrow (1+i_1)^n = \frac{A_1}{a_1} = \frac{5200}{3803796} = 1,367058$$

$$1,310796 < 1,367058 < 1,402552$$

$$4 < n < 5$$

$$\begin{cases} (1+7\%)^5 \rightarrow 1,4022552 \\ (1+7\%)^4 \rightarrow 1,367058 \\ (1+7\%)^4 \rightarrow 1,310796 \end{cases} \begin{cases} (5-4)=1 \rightarrow 0,091756 = (1,4022552 - 1,367058) \\ (5-m) \rightarrow 0,038797 = (1,4022552 - 1,367058) \end{cases}$$

$$\Rightarrow 5-m = \frac{0,038797}{0,091756} \Rightarrow m = 5 - 0,38688828 = \underline{4,61311172}$$

حل 30

$$a_1 + a_2 = 80000 + 4600,32 = 126007,32$$

4 سنوات في أسس و 10 أيام

$$(1+i_2)^4 = \frac{A_2}{a_2} = \frac{199231,1 - 1,5938488}{125000}$$

$$1,587616 < 1,5938488 < 1,601807$$

$$12,25 < i < 12,5$$

$$\begin{cases} (1+12,5\%)^4 \rightarrow 1,601807 \\ (1+i)^4 \rightarrow 1,5938488 \\ (1+12,25\%)^4 \rightarrow 1,587616 \end{cases} \begin{cases} 0,25\% \rightarrow 0,014191 \\ 12,5 - i \rightarrow 0,0079582 \end{cases}$$

$$\Rightarrow i = 12,5 - 0,01401981 = \underline{12,36\%}$$

$$a_1 + a_2 = 80000 + 4600,32 = 126007,32$$

$$1,26007,32 = 1,586874 a_1 + 1,555454 a_2$$

avec $a_2 = 80000 - a_1$

$$\Leftrightarrow 1,586874 a_1 + 1,555454 (80000 - a_1) = 126007,32$$

$$\Rightarrow 0,03142 a_1 = 126007,32 - 124436,32$$

$$a_1 = 50000$$

$$a_2 = 30000$$

29

$$\frac{5}{3} = \frac{a_1 (1,04)^7}{(300000 - a_1) (1,04)^{10}} = \frac{a_1}{(300000 - a_1) (1,04)^3} = \frac{a_1}{337489,2 - 1,124864 a_1}$$

$$\Leftrightarrow 3 a_1 = 1687296 - 6,62432 a_1 \Rightarrow a_1 = 195644 \quad a_2 = 104356$$

حل 34

$$A_2 = 3000 (1+0,12)^2 = 3000 (1,254400) = 3763,2$$

$$A_3 = 4999,5 (1+0,065)^{3 \times 2} = 4999,5 (1,459142) = 729498$$

$$A_7 = 3844,23 (1+0,065)^{7 \times 2} = 3844,23 (2,41484) = 9283,3321$$

$$a_2 = 3763,2 + 1236,3 = 4999,5$$

$$a_3 = 7294,98 - 3450,75 = 3844,23$$

13

$$m = 17625,7 \rightarrow V_0 = 17625,7 (1,03)^{-9} =$$

$$\frac{35}{38} \text{ حل}$$

$$\boxed{13508,63}$$

$$1) V_6 = V_n - E = 20000 - 17742,10 = 1857,90 = 20000 (1+i)^{-4}$$

$$(1+i)^{-4} = 0,762895 \Rightarrow i = 7\%$$

حل

$$2) 12000 (1+0,08)^n = 5000 (1,08)^{2n} + 4000 (1,08)^{2n-1} + 3000 (1,08)^{2n-2}$$

$$(1+0,08)^{-2n} = \frac{5000 (0,857339) + 4000 (0,793832) + 3000 (0,735030)}{12000}$$

$$(1,08)^{-2n} = 0,805892$$

$$0,793832 < 0,805892 < 0,867339$$

$$-3 < -n < -2$$

$$2 < n < 3$$

$$\begin{cases} (1,08)^{-2} \rightarrow 0,817339 \\ (1,08)^{-4} \rightarrow 0,680583 \\ (1,08)^{-6} \rightarrow 0,573450 \end{cases}$$

$$\Leftrightarrow \begin{cases} 1 \text{ ans} \rightarrow 0,06307 \\ -2 + n \rightarrow 0,081747 \end{cases} \Leftrightarrow -2 + n = 0,081747$$

$\Rightarrow n = 2,81 \dots \Rightarrow 2 \text{ ans } 9 \text{ mois et } 23 \text{ jours}$

1) القيمة المكتسبة بدفعات اقسام المدة

$$V_n = a \left[\frac{(1+i)^n - 1}{i} \right] \Leftrightarrow \frac{(1+i)^n - 1}{i} = \frac{V_n}{a} = \frac{268633,806}{14000} = 19,188129$$

$i = 6,25\%$ نجد $19,188129$ وعند القيمة

2) $\frac{(1+i)^{10} - 1}{i} = \frac{125276}{8000} = 15,652$

عند $n=10$ ، القيمة $15,652$ نجد $9,75 < i < 9,6$

$\frac{(1,0975)^{10} - 1}{0,0975} \rightarrow 15,747622$	$\rightarrow 0,25\% \rightarrow 0,18733$
$\frac{(1+i)^{10} - 1}{i} \rightarrow 15,652$	$\leftarrow (9,75\% - i) \rightarrow 0,09562$
$\frac{(1,095)^{10} - 1}{0,095} \rightarrow 15,560290$	$i = \frac{(9,75 \cdot 0,18733) - (0,09562 \cdot 0,25)}{0,18733} = 9,62\%$

3) $i_s = 8,5\%$

$m = 6 \text{ ann}$ $m \cdot k = 12$

$$V_n = a \left[\frac{(1+i_s)^{n \cdot k} - 1}{i_s} \right] = 58000 \left[\frac{(1,085)^{12} - 1}{0,085} \right] = 58000 (19,549250)$$

$V_n = 1133855$

القيمة المكتسبة بدفعات اول المدة

$$V_n^* = a(1+i) \left[\frac{(1+i)^n - 1}{i} \right] = 12500 (1,12) \left[\frac{(1,12)^9 - 1}{0,12} \right]$$

$$= 12500 (1,12) (14775656)$$

$V_n^* = 206859,1884$

1) القيمة الحالية لدفعات اول المدة

$$V_0^* = V_0 (1+i) \Leftrightarrow (1+i) = \frac{V_0^*}{V_0} \Leftrightarrow i = \frac{V_0^*}{V_0} - 1 = \frac{11036,4462}{10125,18} - 1$$

$i = 0,09$ $i = 9\%$

2) $V_0 = a \left[\frac{1 - (1+i)^{-n}}{i} \right] \Leftrightarrow 1 - \frac{1 - (1,09)^{-n}}{0,09} = \frac{V_0}{a} = \frac{1025,18}{4000} = 2,53795$

3) دفعات $m=3$ من الجدول المالي رقم 4 $i = 9,62\%$

البند 2

1) $V_n = a_2 \frac{(1+i_2)^n - 1}{i_2} + a_1 \frac{(1+i_1)^n - 1}{i_1} = 510930$

البند 1

الوفية الموظفة في البنك بواسطة الفوائد السنوية للبنك

$$510930 = a_2 (1,06)^{10} + a_1 (0,05) \frac{(1,06)^{10} - 1}{0,06} + a_1$$

$$510930 = \frac{a_2}{2} (1,791) + a_1 (13,183) + a_1 = 2,55465 a_1$$

$a_1 = 200000$ $a_2 = 100000$

2) $a = a_1 (0,05) = 200000 \cdot 0,05$ $a^n = 100000$

حل 43

$$1) V_n^* = a \frac{(1+i)^n - 1}{i} = 1321480,3$$

$$V_n = a \left[\frac{(1+i)^n - 1}{i} \right]$$

15

$$V_n^* - V_n = 182273,1 \Leftrightarrow V_n = V_n^* - 182273,1$$

$$V_n = 1321480,3 - 182273,1$$

$$V_n = 1139207,2$$

$$V_n^* = V_n(1+i) \Leftrightarrow i = \frac{V_n^*}{V_n} - 1 = \frac{1321480,3}{1139207,2} - 1 \Rightarrow i = 16\%$$

$$2) V_n = a \left[\frac{(1+i)^n - 1}{i} \right] \quad a = \frac{V_n}{\frac{(1+i)^n - 1}{i}} = \frac{1139207,2}{\frac{(1,16)^8 - 1}{0,16}}$$

$$a = 80000$$

حل 44

قيمة العمل = القيمة الحالية للدفعات

$$V_0 = a_1 \frac{1 - (1+i)^{-n}}{i} = 25000 \cdot \frac{1 - (1,06)^{-15}}{0,06} = 25000 (9,712249) = \underline{242806}$$

حساب قيمة الدفعة الجديد

$$200000 = \left(\frac{1}{5} \times 250000 \right) - 250000 = \text{القيمة الحالية للدفعات}$$

$$a = V_0 \frac{i}{1 - (1+i)^{-n}} = 200000 \frac{0,06}{1 - (1,06)^{-5}} = \underline{47479,28}$$

$$250000 = \frac{1}{5} (250000) + a \frac{1 - (1,06)^{-5}}{0,06}$$

حل 45

$$1) V_{0,1} = 47500$$

$$2) V_{0,2} = 62500(1,04)^{-5} = 51370$$

$$3) V_{0,3} = 4500 \frac{1 - (1,04)^{-15}}{0,04} = 50032,74$$

$$1) V_n = a \frac{(1+i)^n - 1}{i} = 20000 \frac{(1,05)^{20} - 1}{0,05} = 20000(33,065954)$$

$$2) V_n' = 20000 \frac{(1,05)^{10} - 1}{0,05} (1,05)^{10} + 30000 \frac{(1,05)^{10} - 1}{0,05} = 20000(12,577893)(1,628895) + 30000(12,577893)$$

$$V_n' = 787098,131$$

$V_{01} = V_{02}$ (تساوي القيمة الحالية)

$$\Leftrightarrow 80000 \frac{1 - (1,05)^{-6}}{0,055} = a \frac{1 - (1,05)^{-9}}{0,055}$$

$$\Leftrightarrow 80000(4,995530) = a(6,952195)$$

$$\Leftrightarrow 39964,24 = a(6,952195)$$

$$a = \frac{39964,24}{6,952195} = 5748,44$$

حل 18

حل 17