SOLUCIÓN TRABAJO PRACTICO Nº 13 - BAILY

Punto 1

Vo= $ 120,000.00
n= 10 cuotas mensuales
id= 0.02 mensual
m= 12

a) C = (Vo + Vo * id * n) / n

C = (120.000 + 120000 * 0,02 * 10) / 10 **C = $ 14,400.00**

b) Tasa sobre Saldo

$h = (c*n/Vo)^{2/n+1} - 1$ $h = (\$\ 14.400,00*10/\ \$\ 120.000,00)^{2/10+1} - 1 =$ 0.033704936

$i = \left(\frac{12 - (n-1) * h}{12 - 2*(n-1) * h} * h \right)$ $i = \frac{12 - (10-1)* 0,033704936}{12- 2*(10-1)* 0,033704936} * 0,033704936 =$ **0.034602323** Mensual

c) Tasa Efectiva anual

$i' = (1 + 0.03460232)^{12} - 1 =$ **0.50411620** Anual

d) Verificación de exactitud de la tasa hallada

Vo = $ 14.400,00 * (1- (1+**0,034602323**)$^{-10}$)/ **0,034602323**

Vo = $ 119,999.52

e) Cuadro de marcha de Amortización

		0.0346023			
n	***cuota***	***ik***	***ck***	***ek***	***rk***
0					120000.00
1	14,400.00	4152.28	10247.72	10247.72	109752.28
2	14,400.00	3797.68	10602.32	20850.04	99149.96
3	14,400.00	3430.82	10969.18	31819.22	88180.78
4	14,400.00	3051.26	11348.74	43167.96	76832.04
5	14,400.00	2658.57	11741.43	54909.39	65090.61
6	14,400.00	2252.29	12147.71	67057.11	52942.89
7	14,400.00	1831.95	12568.05	79625.16	40374.84
8	14,400.00	1397.06	13002.94	92628.09	27371.91
9	14,400.00	947.13	13452.87	106080.96	13919.04
10	14,400.00	481.63	13918.37	119999.33	0.67

Punto 2

Vo= $ 104,000.00
n= 4 cuotas mensuales
id= 0.04 mensual
m= 12

a) C = Vn / n C = (Vo + Vo * id * n) / n

C = $ 104.000,00 /4 = **C = $ 26,000.00**

Valor recibido: Vn – Vn * id * n

Vo = $ 104.000,00 - 104.000*0,04*4 **Vo = $ 87,360.00**

b) Tasa sobre Saldo

h = (c*n/Vo) $^{2/n+1}$ – 1 h = ($ 2.600,00*4/ $ 8.736,00)$^{2/4+1}$ – 1 = 0.072231

$$i = \left(\frac{12 - (n-1) * h}{12 - 2*(n-1) * h} * h \right)$$

i = $\frac{12 - (4-1)* 0,072231}{12 - 2*(4-1)* 0,072231} * 0,072231 =$ **0.073584012**

c) Tasa Efectiva anual

i´ = (1 + **0.07358401**) ^{12} - 1 = **1.34440383** Anual

d) Verificación de exactitud de la tasa hallada

Vo = $ 2.600,00 (1- (1+**0,073584012**)$^{-4}$) / **0,073584012**

Vo = $ 87,359.61

e) Cuadro de marcha de Amortización

		0.073584			
n	***cuota***	***ik***	***ck***	***ek***	***rk***
0					87360.00
1	26,000.00	6428.30	19571.70	19571.70	67788.30
2	26,000.00	4988.14	21011.86	40583.57	46776.43
3	26,000.00	3442.00	22558.00	63141.57	24218.43
4	26,000.00	1782.09	24217.91	87359.48	0.52

Punto 3

Vo= $ 8,000.00
n= 5 cuotas mensuales
id= 0.035 mensual
m= 12

a) C = (Vo + Vo * id * n) / n

C= (8.000 + 8.000 * 0,035 * 5) / 5 **C = $ 1,880.00**

N = 5 -1 =4
Vo = 8000 - 1880 = 6120

b) Tasa sobre Saldo

$h = (c*n/Vo)^{2/n+1} - 1$ $\quad h = (\$\ 1.880,00*4/\ \$\ 6.120,00)^{2/4+1} - 1 =$ 0.085891834

$$i = \left(\frac{12 - (n-1) * h}{12 - 2*(n-1) * h} * h \right)$$

$$i = \frac{12 - (4-1)* 0,087818948}{12 - 2*(4-1)* 0,085891834} * 0,085891834 =$$

0.087818948 Mensual

c) Tasa Efectiva anual

$i' = (1 +$ **0.08781894** $)^{12} - 1 =$ **1.74586657** Anual

d) Verificación de exactitud de la tasa hallada

Vo = $ 1880,00 (1- (1+**0,087818948**)$^{-4}$)/ **0,087818948**

Vo = $ 6,119.95

e) Cuadro de marcha de Amortización

		0.0878189			
n	***cuota***	***ik***	***ck***	***ek***	***rk***
0					6120.00
1	1,880.00	537.45	1342.55	1342.55	4777.45
2	1,880.00	419.55	1460.45	2803.00	3317.00
3	1,880.00	291.30	1588.70	4391.70	1728.30
4	1,880.00	151.78	1728.22	6119.92	0.08

Punto 4

Vo= $ 48,000.00
n= 4 cuotas trimestrales
C= 13379.7 bimestral
m= 4

Tasa sobre Saldo

$h = (c*n/Vo)^{2/n+1} - 1$ $\quad h = (\$\ 1.337,97 * 4 / \$\ 4.800,00)^{2/4+1} - 1 =$ 0.044494246

$$i = \left(\frac{12 - (n-1) * h}{12 - 2*(n-1) *} * h \right)$$

$$i = \frac{12 - (4-1)* 0,044494246}{12 - 2*(4-1)* 0,044494246} * 0,044494246 =$$

0.045000442 trimestral

COMPROBACION:

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

$13.379,70 * \frac{1 - (1 + 0,045000442)^{-4}}{0.045000442} =$ **$47,999.97**

Punto 5

Vo= ?
n= 48 cuotas mensuales
α= 15000 mensual
i= 0.03 mensual
cuota = 15 se transfiere el credito

$R_k = \alpha * a_{\overline{n-k}}$

$$Rk = \alpha \frac{1 - (1+i)^{-(n-k)}}{i}$$

$$Rk = V0 \frac{1 - (1+i)^{-(n-k)}}{1 - (1+i)^{-n}}$$

$$Rk = V0 \frac{1 - v^{n-k}}{1 - v^{n}}$$

$$R_{15} = 15.000 * \frac{1 - (1 + 0,03)^{-(48-15)}}{0.03} =$$

$ 311,486.88 Saldo de la deuda luego del pago de la decima cuota.

a)

Vo= $ 340,000.00
n= 33 cuotas mensuales
α= 15,000 mensual
i= ? mensual

Tasa sobre Saldo:

$h = (c*n/Vo)^{2/n+1} - 1$

$h = (\$\ 15.000*33/\ \$\ 340.000)^{2/33+1} - 1 =$ 0.022340731

$$i = \left[\frac{12 - (n-1) * h}{12 - 2*(n-1) * h} * h \right]$$

$$i = \frac{12 - (33-1)* 0,022340731}{12- 2*(33-1)* 0,0022340731} * 0,022340731 =$$ **0.023851721**

Mensual

COMPROBACION:

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

$15{,}000 * \frac{1-(1+0{,}023851721)^{-33}}{0.023851721} =$ **$ 339,984.86**

Punto 6

Precio contado: 650000
Entrega: 150000
Financiacion : 650000 - 150000 = 500000

a)

Vo= $ 500,000.00
n= 36
α= 17000
m= 12

a) Tasa sobre Saldo i= ?

$h = (c*n/Vo)^{2/n+1} - 1$ $h = (\$\ 1700*36/\ \$\ 50.000)^{2/36+1} - 1 =$ 0.010985534

$i = \left[\frac{12 - (n-1)*h}{12 - 2*(n-1)*h} * h \right]$ **i =** $\frac{12 - (36-1)*0{,}010985534}{12 - 2*(36-1)*0{,}010985534} * 0{,}010985534 =$ **0.014400879**

Tasa Efectiva anual

$i' = (1+\mathbf{0{,}014400879})^{12} - 1 =$ **0.14519025** Anual

COMPROBACION:

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

$1700 * \frac{1-(1+0{,}011361624)^{-36}}{0.011361624} =$ **$ 499,988.36**

b)

Vo= $ 500,000.00
n= 48
α= 14500
m= 12

b) Tasa sobre Saldo i= ?

$h = (c*n/Vo)^{2/n+1} - 1$ $h = (\$\ 1.450*48/\ \$\ 50.000)^{2/48+1} - 1 =$ 0.013591187

$i = \left[\frac{12 - (n-1)*h}{12 - 2*(n-1)*h} * h \right]$ **i =** $\frac{12 - (48-1)*0{,}013591187}{12 - 2*(48-1)*0{,}013591187} * 0{,}013591187 =$ **0.014400879**

Tasa Efectiva anual

$i' = (1+\mathbf{0{,}014400879})^{12} - 1 =$ **0.187176** Anual

COMPROBACION:

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

$1.450 * \frac{1-(1+0{,}014400879)^{-48}}{0.014400879} =$ **$ 499,988.70**

Rta: La opcion mas conveniente de financiacion es la a) - (la menor tasa efectiva).

Punto 7

a)

Vo= $ 47,500.00
n= 12
α= 4200
m= 12

a) Tasa sobre Saldo i= ?

$h = (c*n/Vo)^{2/n+1} - 1$ $h = (\$\ 4200*12/\ \$\ 47.500)^{2/12+1} - 1 =$ 0.009158836

$$i = \left(\frac{12 - (n-1) * h}{12 - 2*(n-1) * h} * h \right)$$

$$i = \frac{12 - (12-1)* 0{,}009158836}{12 - 2*(10-1)* 0{,}009158836} * 0{,}009158836 =$$ **0.009237043**

COMPROBACION:

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

$$\frac{4200 * 1 - (1 + 0{,}009237043)^{-12} =}{0.009237043}$$ **$47,500.00**

Tasa Efectiva anual

$i' = (1+$**0,009237043**$)^{12} - 1 =$ **0.11665288** Anual

b)

Vo= $ 47,500.00
n= 8
α= 6200
m= 12 i= ?

b) Tasa sobre Saldo

$h = (c*n/Vo)^{2/n+1} - 1$ $\quad h = (\$\ 6200 * 8/ \$\ 47.500)^{2/8+1} - 1 =$ 0.009659942

$$i = \left(\frac{12 - (n-1) * h}{12 - 2*(n-1) * h} * h \right)$$

$$i = \frac{12 - (8-1)* 0{,}009659942}{12 - 2*(8-1)* 0{,}009659942} * 0{,}009659942 =$$ **0.009714996**

COMPROBACION:

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

$$\frac{620 * 1 - (1 + 0{,}009714996)^{-8} =}{0.009714996}$$ **$ 47,500.00**

Tasa Efectiva anual

$i' = (1+$**0,009714996**$)^{12} - 1 =$ **0.12301530** Anual

c)

Vo=	$ 37.500.00
n=	11
α=	3600
m=	12

c) Tasa sobre Saldo $\quad i=$?

$h = (c*n/Vo)^{2/n+1} - 1$ $\quad h = (\$\ 3600*11/ \$\ 37500)^{2/11+1} - 1 =$ 0.009122725

$$i = \left(\frac{12 - (n-1) * h}{12 - 2*(n-1) * h} * h \right)$$

$$i = \frac{12 - (11-1)* 0{,}009122725}{12 - 2*(11-1)* 0{,}009122725} * 0{,}009122725 =$$ **0.009193149**

COMPROBACION:

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

$$\frac{3600 * 1 - (1 + 0{,}009193149)^{-11} =}{0.009193149}$$ **$ 37,500.00**

Tasa Efectiva anual

$i' = (1+$**0,009193149**$)^{12} - 1 =$ **0.1160702** Anual

d)

Vo=	$ 42,500.00
n=	14
α=	3280
m=	12

d) Tasa sobre Saldo $\quad i=$?

$h = (c*n/Vo)^{2/n+1} - 1$ $\quad h = (\$\ 3280*14/ \$\ 42.500)^{2/14+1} - 1 =$ 0.010372987

$$i = \left(\frac{12 - (n-1) * h}{12 - 2*(n-1) * h} * h \right)$$

$$i = \frac{12 - (14-1)* 0{,}010372987}{12 - 2*(14-1)* 0{,}010372987} * 0{,}010372987 =$$ **0.010492233**

COMPROBACION:

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

$$\frac{328 * 1 - (1 + 0{,}010492233)^{-14} =}{0.010492233}$$ **$ 42,500.00**

Tasa Efectiva anual

$i' = (1+\mathbf{0,010492233})^{12} - 1 =$ **0.13343274** Anual

Punto 8

Vo= $ 90,000.00
n= 9 aj — 10 cuotas bimentrales
id= 0.048 bimestral — 0.024 mensual
m= 6

a) $C = (Vo + Vo * id * n) / n$

$C = (90.000 + 90.000 * 0,048 * 10) / 10$

C = $ 13,320.00

$Vo = 90.000 - 13.320$

Vo = $ 76,680.00

b) Tasa sobre Saldo

$h = (c*n/Vo)^{2/n+1} - 1$ $\quad h = (\$\ 13.320,00*9/\ \$\ 90.000,00)^{2/19+1} - 1 =$ 0.093485242

$$i = \left[\frac{12 - (n-1) * h}{12 - 2*(n-1) * h} * h\right] \qquad i = \frac{12 - (9-1)* 0,093485242}{12 - 2*(9-1)* 0,093485242} * 0,093485242 =$$

0.100141216 Mensual

c) Tasa Efectiva anual

$i' = (1 + \mathbf{0.10014121})^{6} - 1 =$ **0.77292601** Anual

d) Verificación de exactitud de la tasa hallada

$Vo = \$\ 13.320,00 * (1- (1+\mathbf{0,100141216})^{-9})/ \mathbf{0,100141216}$

Vo = $ 76,667.16

e) Cuadro de marcha de Amortización

		0.1001412			
n	***cuota***	***ik***	***ck***	***ek***	***rk***
0					76680.00
1	13,320.00	7678.83	5641.17	5641.17	71038.83
2	13,320.00	7113.91	6206.09	11847.26	64832.74
3	13,320.00	6492.43	6827.57	18674.83	58005.17
4	13,320.00	5808.71	7511.29	26186.12	50493.88
5	13,320.00	5056.52	8263.48	34449.60	42230.40
6	13,320.00	4229.00	9091.00	43540.60	33139.40
7	13,320.00	3318.62	10001.38	53541.98	23138.02
8	13,320.00	2317.07	11002.93	64544.91	12135.09
9	13,320.00	1215.22	12104.78	76649.68	30.32

Punto 9

Vo = $ 48.000,00 iva: 21%
n = 24
i=0,1475 anual
Costo de Otorgamiento: 3,00%
Costo de mantenimiento: $ 48,40
Seguro: $ 25

Determinación de la cuota

$$Vo = a\left(\frac{(1+ i * g)^n -1}{i * g\ (1 + i * g)^n}\right)$$

$$\$48.000 = a\left(\frac{(1+ 0{,}1475/12 * 1{,}21)^{24} -1}{0{,}1475/12 * 1{,}21\ (1 + 0{,}1475/12 * 1{,}21)^{24}}\right)$$

a = $ 2.392,82

Cuota total con gastos: $ 2.392,82 + $ 73,40 = $ 2.466,22

Cuadro de Marcha de amortización

n	Cuota	Gastos	IK	IVA	Ck	Ek	Rk
0			0,01229166				48.000,00
1	2.466,22	73,40	590,00	123,90	1.678,92	1678,92	46.321,08
2	2.466,22	73,40	569,36	119,56	1.703,90	3.382,82	44.617,18
3	2.466,22	73,40	548,42	115,17	1.729,23	5.112,05	42.887,95
4	2.466,22	73,40	527,16	110,70	1.754,96	6.867,01	41.132,99
5	2.466,22	73,40	505,60	106,18	1.781,04	8.648,05	39.351,95
6	2.466,22	73,40	483,70	101,58	1.807,54	10.455,59	37.544,41
7	2.466,22	73,40	461,48	96,91	1.834,43	12.290,02	35.709,98
8	2.466,22	73,40	438,94	92,18	1.861,70	14.151,72	33.848,28

Determinación del Costo efectivo

a = $ 2.466,22

Valor Neto recibido: $ 48.000,00 – 3% de $ 48.000,00: $ 46.560,00

Debo hallar la tasa de interés efectiva teniendo en cuenta la cuota total de interés y el valor neto recibido.

$h = (24*\$\ 2.466{,}22/\ \$\ 46.560{,}00\ )^{2/\ 24+1} - 1 = 0{,}019385394$

$$i = \frac{12-(24-1)* 0{,}019385394}{12- 2*(24-1)* 0{,}019385394} * 0{,}019385394 = 0{,}020163485$$

Costo efectivo anual $i' = (1+0{,}020163485)^{12} - 1 = 0{,}270683228$