SOLUTIONS TO SELECTED PROBLEMS

Student: You should work the problem completely before referring to the solution.

CHAPTER 3

Solutions included for problems 1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 46, 49, 52, 55, 58, and 61

3.1 P = 100,000(260)(P/A,10%,8)(P/F,10%,2)
= 26,000,000(5.3349)(0.8264)
= $114.628 million

3.4 P = 100,000(P/A,15%,3) + 200,000(P/A,15%,2)(P/F,15%,3)
= 100,000(2.2832) + 200,000(1.6257)(0.6575)
= $442,100

3.7 A = [0.701(5.4)(P/A,20%,2) + 0.701(6.1)(P/A,20%,2)((P/F,20%,2)](A/P,20%,4)
= [3.7854(1.5278) + 4.2761(1.5278)(0.6944)](0.38629)
= $3.986 billion

3.10 A = 8000(A/P,10%,10) + 600
= 8000(0.16275) + 600
= $1902

3.13 A = 15,000(F/A,8%,9)(A/F,8%,10)
= 15,000(12.4876)(0.06903)
= $12,930

3.16 A = [20,000(F/A,8%,11) + 8000(F/A,8%,7)](A/F,8%,10)
= [20,000(16.6455) + 8000(8.9228)]{0.06903)
= $27,908

3.19 100,000 = A(F/A,7%,5)(F/P,7%,10)
100,000 = A(5.7507)(1.9672)
A = $8839.56

3.22 Amt year 5 = 1000(F/A,12%,4)(F/P,12%,2) + 2000(P/A,12%,7)(P/F,12%,1)
= 1000(4.7793)(1.2544) + 2000(4.5638)(0.8929)
= $14,145

3.25 Move unknown deposits to year –1, amortize using A/P, and set equal to $10,000:
x(F/A,10%,2)(F/P,10%,19)(A/P,10%,15) = 10,000
x(2.1000)(6.1159)(0.13147) = 10,000
x = $5922.34

3.28 Find P at t = 0 and then convert to A:
P = $22,994

A = 22,994(A/P,12%,8)
= 22,994(0.20130)
= $4628.69

3.31 Amt year 3 = 900(F/A,16%,4) + 3000(P/A,16%,2) – 1500(P/F,16%,3)
+ 500(P/A,16%,2)(P/F,16%,3)
= 900(5.0665) + 3000(1.6052) – 1500(0.6407)
+ 500(1.6052)(0.6407)
= $8928.63

3.34 P = [4,100,000(P/A,6%,22) – 50,000(P/G,6%,22)](P/F,6%,3)
+ 4,100,000(P/A,6%,3)
= [4,100,000(12.0416) – 50,000(98.9412](0.8396)
+ 4,100,000(2.6730)
= $48,257,271

3.37 First find P at t = 0 and then convert to A:
P = $82,993

A = 82,993(A/P,12%,5)
= 82,993(0.27741)
= $23,023

3.40 40,000 = x(P/A,10%,2) + (x + 2000)(P/A,10%,3)(P/F,10%,2)
40,000 = x(1.7355) + (x + 2000)(2.4869)(0.8264)
3.79067x = 35,889.65
x = $9467.89 (size of first two payments)

3.43 Find P in year –1 and then find A in years 0-5:
P_g (in yr 2) = (5)(4000){[1 - $(1 + 0.08)^{18}$/$(1 + 0.10)^{18}$]/(0.10 - 0.08)}
= $281,280
P in yr –1 = 281,280(P/F,10%,3) + 20,000(P/A,10%,3)
= $261,064

A = 261,064(A/P,10%,6)
= $59,943

3.46 Find P in year –1 and then move to year 0:

$P\ (\text{yr} -1) = 15{,}000\{[1 - (1 + 0.10)^5/(1 + 0.16)^5]/(0.16 - 0.10)\}$

$= \$58{,}304$

$P = 58{,}304(F/P,16\%,1)$

$= \$67{,}632$

3.49 $P = 5000 + 1000(P/A,12\%,4) + [1000(P/A,12\%,7) - 100(P/G,12\%,7)](P/F,12\%,4)$

$= \$10{,}198$

3.52 $P = 2000 + 1800(P/A,15\%,5) - 200(P/G,15\%,5)$

$= \$6878.94$

3.55 $P = 7 + 7(P/A,4\%,25)$

$= \$116.3547$ million

Answer is (c)

3.58 $\text{Balance} = 10{,}000(F/P,10\%,2) - 3000(F/A,10\%,2)$

$= 10{,}000(1.21) - 3000(2.10)$

$= \$5800$

Answer is (b)

3.61 $100{,}000 = A(F/A,10\%,4)(F/P,10\%,1)$

$100{,}000 = A(4.6410)(1.10)$

$A = \$19{,}588$

Answer is (a)