SOLUTIONS TO SELECTED PROBLEMS

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

CHAPTER 6

Solutions included for problems 1, 4, 7, 10, 13, 16, 19, 22, 25, 28, and 31

6.1 The estimate obtained from the three-year AW would not be valid, because the AW calculated over one life cycle is valid only for the entire cycle, not part of the cycle. Here the asset would be used for only a part of its three-year life cycle.

6.4 \[ AW_{centrifuge} = -250,000 \frac{A}{P,10\%,6} - 31,000 + 40,000 \frac{A}{F,10,6} \]
\[ = -$83,218 \]
\[ AW_{belt} = -170,000 \frac{A}{P,10\%,4} - 35,000 - 26,000 \frac{P}{F,10\%,2} \frac{A}{P,10\%,4} + 10,000 \frac{A}{F,10\%,4} \]
\[ = -$93,549 \]
Select centrifuge.

6.7 \[ AW_X = -85,000 \frac{A}{P,12\%,3} - 30,000 + 40,000 \frac{A}{F,12\%,3} \]
\[ = -$53,536 \]
\[ AW_Y = -97,000 \frac{A}{P,12\%,3} - 27,000 + 48,000 \frac{A}{F,12\%,3} \]
\[ = -$53,161 \]
Select robot Y by a small margin.

6.10 \[ AW_C = -40,000 \frac{A}{P,15\%,3} - 10,000 + 12,000 \frac{A}{F,15\%,3} \]
\[ = -$24,063 \]
\[ AW_D = -65,000 \frac{A}{P,15\%,6} - 12,000 + 25,000 \frac{A}{F,15\%,6} \]
\[ = -$26,320 \]
Select machine C.

6.13 \[ AW_{land} = -110,000 \frac{A}{P,12\%,3} - 95,000 + 15,000 \frac{A}{F,12\%,3} \]
\[ = -$136,353 \]
\[ AW_{incin} = -800,000 \frac{A}{P,12\%,6} - 60,000 + 250,000 \frac{A}{F,12\%,6} \]
\[ = -$223,777 \]
\[ AW_{contract} = -$190,000 \]
Use land application.
6.16 \[ AW_{100} = 100,000(A/P, 10\%, 100) \]
\[ = $10,001 \]

\[ AW_{\infty} = 100,000(0.10) \]
\[ = $10,000 \]

Difference is $1.

6.19 \[ AW = -100,000(0.08) - 50,000(A/F, 8\%, 5) \]
\[ = -100,000(0.08) - 50,000(0.17046) \]
\[ = $-16,523 \]

6.22 Find P in year \(-1\), move to year 9, and then multiply by i. Amounts are in $1000.

\[ P_{-1} = [100(P/A, 12\%, 7) - 10(P/G, 12\%, 7)](F/P, 12\%, 10) \]
\[ = $1055.78 \]

\[ A = 1055.78(0.12) \]
\[ = $126.69 \]

6.25 Find PW in year 0 and then multiply by i.

\[ PW_0 = 50,000 + 10,000(P/A, 10\%, 15) + (20,000/0.10)(P/F, 10\%, 15) \]
\[ = $173,941 \]

6.28 Note: \(i\) = effective 10\% per year.

\[ A = [100,000(F/P, 10\%, 5) - 10,000(F/A, 10\%, 6)](0.10) \]
\[ = $8389 \]

6.31 \[ AW = -800,000(0.10) - 10,000 \]
\[ = $-90,000 \]

Answer is (c)