Problem 7-2

Goal: Determine how much to deposit in annuity depreciation set aside fund

Given:

Tower cost	$50,000	$V_{initial}$
Nominal interest	0.06	$i_{effective}$
Length	10	**n, years**
Scrap value	$5,000	V_{scrap}

The equation: $F = A[((1 + i)^n - 1)/ i]$ Table. 7-3 annuity factor

Approach: ***ASSUME*** replacement cost = original cost
Annual interest rate and annual deposits, then i same
Use annuity interest factor to determine annual deposits to accumulate future sum value
b) Straight line depreciation based on scrap value

Calculations:

(1) Compounded annually 0.06 $i_{nominal}$ since annual compounding effective = nominal = per period

Factor (A/F, *i* , N)	0.07587	$= 0.06 / [(1 + 0.06)^{10} - 1]$
Annual deposits, A	$3,793.40	$= 50,000 [0.06/((1 + 0.06)^{10} - 1)]$

Answer **$3,793.40** annual deposits to accumulate $50,000

Value to depreciate	$45,000	$= V_{initial} - V_{scrap} = \$50,000 - \$5,000$
Straight line depreciation	$4,500	$= V / n = \$45,000/10$
Asset value after 5 years =	$27,500	$= V_{initial} - \#\text{ yrs} * d_{annual} = \$50,000 - 5*\$4,500$

Alternatively:

1	$45,500	$= V_{initial} - d_{annual} = \$50,000 - \$4,500$
2	$41,000	$= V_{bv-1} - d_{annual} = \$45,500 - \$4,500$
3	$36,500	$= V_{bv-2} - d_{annual} = \$41,000 - \$4,500$
4	$32,000	$= V_{bv-3} - d_{annual} = \$36,500 - \$4,500$
5	$27,500	$= V_{bv-4} - d_{annual} = \$32,000 - \$4,500$

Answer **$27,500** Present worth of all deposits

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