

45.14 A company is considering whether to invest in a piece of equipment that will have an initial cost of \$100,000 and will produce \$50,000 per year in revenue for the next 3 years before maintenance costs and taxes. Maintenance will cost \$5000 per year. The tax rate is 30% and straight line depreciation is used for the equipment. The equipment has a salvage value of \$20,000 to be realized at the end of year 3. What is the present value of the initiative using a 10% rate of return?

- A. -\$62K
- B. \$18K
- C. \$46K
- D. \$211K

Draw a cash flow diagram and make a list of cash flows.

Year 0: -\$100K

Years 1 & 2: Revenue = 50K and Cost = 5K. The profit before tax is 45K. The taxes may be addressed separately.

Year 3: The cash flow is the same as for years 1 & 2 except for an additional \$20K in salvage value which will be included a separate one-off future payment.

For tax purposes, the profit which is considered taxable is reduced by the depreciation for that year even though the cash was actually spent in year 0. For straight line depreciation, the depreciated amount for years 1, 2, and 3 is the same.

$$D = \frac{\$100,000}{3\text{years}} = \$33,333 \text{ per year}$$

Determine the profit for tax purposes.

$$\textit{Profit} = \textit{Revenue} - (\textit{Expenses} + \textit{Depreciation})$$

$$\textit{Profit} = \$50,000 - (\$5,000 + \$33,333) = \$11,667$$

Apply the tax rate to determine the tax liability.

$$\textit{Tax} = (\$11,667) (0.3) = \$3,500$$

Subtract the tax from the before-tax profit (excluding depreciation) to determine the after-tax profit. This is the net cash flow for years 1 & 2.

$$\textit{After tax Profit} = \$45,000 - \$3,500 = \$41,500$$

For year 3, the salvage value, which is not subject to taxes, will be handled as a separate future payment in our present value calculation. In other words, the \$41,500 will be considered part of an annualized cash flow with a 3 year period.

Calculate the present value. Use the **Economic Factor Tables** to look up the cash flow factors for P/A and P/F based on an interest rate of 10%.

$$PV = -\$100,000 + (\$41,500)(P/A, 10\%, 3) + (\$20,000)(P/F, 10\%, 3)$$

$$PV = -\$100,000 + (\$41,500)(2.4869) + (\$20,000)(0.7513) = \$18,232$$

Answer B