PROBLEM

1. If $10,000 is deposited in the bank today at 9% compounded annually, what will be the balance in 5 years?

2. A company needs $100,000 to retire bonds. What amount must be deposited on Jan. 1, 2004 at 10% interest compounded semiannually in order to accumulate the desired sum by Jan. 1, 2011?

SOLUTION

Step 1: This is a future amount of a single sum problem. Use Table 6-1.

Step 2: \( n = 5; \ i = 9\% \)

Step 3: The interest factor from Table 6-1 is 1.53862.

Step 4: \( FV = PV \times (FVF_{5,9\%}) = 10,000 \times 1.53862 \)

\[ = \underline{15,386.20}. \]

Step 1: This is a present value of a single sum problem. Use Table 6-2.

Step 2: It is 7 years from 1/1/04 to 1/1/11. The annual interest rate is 10%.

\( n = 7 \times 2 = 14; \ i = 10\% \div 2 = 5\% \)

Step 3: The interest factor from Table 6-2 is .50507.

Step 4: \( PV = FV \times (PVF_{14,5\%}) = 100,000 \times .50507 \)

\[ = \underline{50,507}. \]
PROBLEM (continued)

3. If $731,190 can be invested now, what annual interest rate must be earned in order to accumulate $1,000,000 three years from now?

4. Beginning one year from now, six annual deposits of $2,000 each will be made into an account paying 8%. What will be the balance in the account after the sixth deposit?

SOLUTION (continued)

Step 1: This can be solved either as a future amount or as a present value of a single sum. This solution illustrates the present value approach. Use Table 6-2.

Step 2: \( n = 3; \) \( i \) must be solved for:

Step 3: 
\[
PVF_{3,i\%} = \frac{PV}{FV} = \frac{731,190}{1,000,000} = 0.73119.
\]
Refer to Table 6-2 in the 3 period row.
\( i = 11\% \).

Step 1: This is a future amount of an ordinary annuity problem. Use Table 6-3.

Step 2: \( n = 6; \) \( i = 8\% \)

Step 3: The interest factor from Table 6-3 is 7.33592.

Step 4: 
\[
FVOA = R \times (FVF - OA_{6,8\%}) = 2,000 \times 7.33592 = 14,671.84
\]
PROBLEM (continued)
5. What amount must be deposited at 10% in an account on Jan. 1, 2004 if it is desired to make equal annual withdrawals of $5,000 each beginning on Jan. 1, 2005? The last withdrawal will occur on Jan. 1, 2008.

6. Beginning now, six annual deposits of $2,000 each will be made into an account paying 8%. What will be the balance in the account one year after the sixth deposit is made? (Compare this to Problem 4.)

SOLUTION (continued)
Step 1: This is a present value of an ordinary annuity problem. Use Table 6-4.

Step 2: The time diagram shows 4 withdrawals.

\[
\begin{array}{cccccc}
5,000 & 5,000 & 5,000 & 5,000 \\
\end{array}
\]

\[n = 4; \ i = 10\%.
\]

Step 3: The interest factor from Table 6-4 is 3.16986.

Step 4: \[PVOA = R \times (PVF-OA_{4,10\%}) = 5,000 \times 3.16986 = 15,849.30.\]

---

Step 1: This is a future amount of an annuity due problem. Use Table 6-3 with conversion factor.

Step 2: \[n = 6; \ i = 8\%\]

Step 3: The interest factor from Table 6-3 is converted to an annuity due is \((7.33592 \times [1 + .08])\), or 7.92279.

Step 4: \[FVAD = R \times (FVF-OA_{6,8\%}) \times (1 + i) = 2,000 \times 7.92279 = 15,845.58.\]
PROBLEM (continued)

7. An individual became an "instant millionaire" in the state lottery. Beginning today he is to receive 20 annual payments of $50,000 each. At 12%, what is the present value of his winnings?

8. What amount must be deposited at the end of each year in an account paying 9% if it is desired to have $10,000 at the end of the fifth year?

SOLUTION (continued)

Step 1: This is a present value of an annuity due problem. Use Table 6-5.

Step 2: \( n = 20; \ i = 12\% \).

Step 3: The interest factor from Table 6-5 is 8.36578.

Step 4: \[ PVAD = R \times (PVF-AD_{20,12\%}) \]
\[ = \$50,000 \times 8.36578 \]
\[ = \$418,289 \]

Step 1: This is a future amount of an ordinary annuity problem. Use Table 6-3.

Step 2: \( n = 5; \ i = 9\% \)

Step 3: The interest factor from Table 6-3 is 5.98471.

Step 4: \[ R = FVOA \div (FVF-OA_{5,9\%}) \]
\[ = \$10,000 \div 5.98471 \]
\[ = \$1,670.92 \]
PROBLEM (continued)
9. As of the beginning of his first year in college, a student plans to deposit $1,000 in an 8% account at the end of his third, fourth, and fifth years in school. What will be the balance in the account immediately after the last deposit?

SOLUTION (continued)
Step 1: This is a future amount of an ordinary annuity of 3 rents deferred for 2 periods. Use Table 6-3.
Step 2: The time diagram is as follows:

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ n = 3; \ i = 8\% \]
Step 3: The interest factor from Table 6-3 is 3.24640.
Step 4: \[ FVOA = d = R \times (FVF-OA_{3,8\%}) \]
\[ = 1,000 \times 3.24640 \]
\[ = 3,246.40 \]
PROBLEM (continued)
10. What amount must be deposited at 10% on Jan. 1, 2004 to permit annual withdrawals of $500 each beginning on Jan. 1, 2008 and ending on Jan. 1, 2011?

SOLUTION (continued)
Step 1: This is a present value of an ordinary annuity of 4 rents deferred for 3 periods. Use Tables 6-4 and 6-2.

Step 2: The time diagram is as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n = 4; i = 10%; y = 3

Step 3: The interest factors from Table 6-4 are:
(PVF-OA7,10%) = 4.86842,
(PVF-OA3,10%) = 2.48685,
(PVF-OA4,10%) = 3.16986

The factor (PVF3,10%) from Table 6-2 is .75132.

Step 4: PVOA – d = R × (PVF-OA7,10% – PVF-OA3,10%)
= $500 × (4.86842 – 2.48685)
= $1,190.79

OR PVOA – d = R × (PVF-OA4,10% – PVF3,10%)
= $500 × 3.16986 × .75132
= $1,190.79
On January 1, 2004, Servicemaster Corporation issued $100,000, 8% bonds with interest payable semiannually, due in three years. The market rate of interest at the time the bonds were issued was 10%.

How much would the bonds sell for in order to have an effective yield of 10% over the three year period?

Present Value

$4,000 $4,000 $4,000 $4,000 $4,000 $4,000 Interest

1/1/04 6/30/04 12/31/04 6/30/05 12/31/05 6/30/06 12/31/06

$100,000 Principal (Single Sum)

Principal amount of $100,000 to be paid as a single sum at 12/31/06.

3 years × 2 interest periods per year = 6 interest periods.

Stated rate of bond interest = 8% annual interest, paid at 4% each 6 month period.

$100,000 × 4% = $4,000 each 6 month period.

Bonds will yield the market interest of 5% each 6 month period (10% ÷ 2)

Present Value of the Principal: \[ a \times (PVF_{6.5\%}) = $100,000 \times 0.74662 = $74,622.00 \]

Present Value of Interest: \[ R \times (PVF-OA_{6.5\%}) = $4,000 \times 5.07569 = 20,302.76 \]

Present value (market value) bonds $94,924.76
Sample Examination Questions
CHAPTER 6
ACCOUNTING AND THE TIME VALUE OF MONEY

MULTIPLE CHOICE—Conceptual

<table>
<thead>
<tr>
<th>Answer</th>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>d</td>
<td>1</td>
<td>Definition of present value.</td>
</tr>
<tr>
<td>c</td>
<td>2</td>
<td>Understanding compound interest tables.</td>
</tr>
<tr>
<td>a</td>
<td>3</td>
<td>Identification of correct compound interest table.</td>
</tr>
<tr>
<td>d</td>
<td>4</td>
<td>Identification of correct compound interest table.</td>
</tr>
<tr>
<td>c</td>
<td>5</td>
<td>Identification of correct compound interest table.</td>
</tr>
<tr>
<td>c</td>
<td>6</td>
<td>Identification of correct compound interest table.</td>
</tr>
<tr>
<td>b</td>
<td>7</td>
<td>Identification of correct compound interest table.</td>
</tr>
<tr>
<td>d</td>
<td>8</td>
<td>Identification of number of compounding periods.</td>
</tr>
<tr>
<td>a</td>
<td>9</td>
<td>Adjust the interest rate for time periods.</td>
</tr>
<tr>
<td>c</td>
<td>10</td>
<td>Identification of present value of 1 table.</td>
</tr>
<tr>
<td>c</td>
<td>11</td>
<td>Determine present value of an ordinary annuity.</td>
</tr>
<tr>
<td>b</td>
<td>12</td>
<td>Identification of a future value of an ordinary annuity of 1.</td>
</tr>
<tr>
<td>a</td>
<td>13</td>
<td>Appropriate use of an annuity due table.</td>
</tr>
<tr>
<td>c</td>
<td>14</td>
<td>Determine the timing of rents of an annuity due.</td>
</tr>
<tr>
<td>b</td>
<td>15</td>
<td>Present value of an ordinary annuity and an annuity due.</td>
</tr>
<tr>
<td>b</td>
<td>16</td>
<td>Factors of an ordinary annuity and an annuity due.</td>
</tr>
<tr>
<td>b</td>
<td>17</td>
<td>Difference between an ordinary annuity and an annuity due.</td>
</tr>
<tr>
<td>d</td>
<td>18</td>
<td>Definition of deferred annuities.</td>
</tr>
</tbody>
</table>

MULTIPLE CHOICE—Computational

<table>
<thead>
<tr>
<th>Answer</th>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>c</td>
<td>19</td>
<td>Calculate present value of a future amount.</td>
</tr>
<tr>
<td>b</td>
<td>20</td>
<td>Calculate a future value.</td>
</tr>
<tr>
<td>a</td>
<td>21</td>
<td>Calculate a future value of an annuity due.</td>
</tr>
<tr>
<td>b</td>
<td>22</td>
<td>Calculate a future value.</td>
</tr>
<tr>
<td>c</td>
<td>23</td>
<td>Calculate a future value.</td>
</tr>
<tr>
<td>c</td>
<td>24</td>
<td>Calculate present value of a future amount.</td>
</tr>
<tr>
<td>d</td>
<td>25</td>
<td>Calculate present value of a future amount.</td>
</tr>
<tr>
<td>a</td>
<td>26</td>
<td>Calculate present value of an annuity due.</td>
</tr>
<tr>
<td>d</td>
<td>27</td>
<td>Interest compounded quarterly.</td>
</tr>
<tr>
<td>d</td>
<td>28</td>
<td>Calculate the future value of 1.</td>
</tr>
<tr>
<td>a</td>
<td>29</td>
<td>Calculate future value of an annuity due.</td>
</tr>
<tr>
<td>a</td>
<td>30</td>
<td>Calculate present value of an ordinary annuity.</td>
</tr>
<tr>
<td>b</td>
<td>31</td>
<td>Calculate present value of an annuity due.</td>
</tr>
<tr>
<td>a</td>
<td>32</td>
<td>Calculate future value of an ordinary annuity.</td>
</tr>
<tr>
<td>d</td>
<td>33</td>
<td>Calculate future value of an ordinary annuity.</td>
</tr>
<tr>
<td>c</td>
<td>34</td>
<td>Calculate annual deposit for annuity due.</td>
</tr>
</tbody>
</table>

MULTIPLE CHOICE—Computational (cont.)

<table>
<thead>
<tr>
<th>Answer</th>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>d</td>
<td>35</td>
<td>Calculate cost of machine purchased on installment.</td>
</tr>
<tr>
<td>b</td>
<td>36</td>
<td>Calculate cost of machine purchased on installment.</td>
</tr>
<tr>
<td>c</td>
<td>37</td>
<td>Calculate cost of machine purchased on installment.</td>
</tr>
<tr>
<td>a</td>
<td>38</td>
<td>Calculate the annual rents of leased equipment.</td>
</tr>
</tbody>
</table>
b 39. Calculate present value of an investment in equipment.
b 40. Calculate proceeds from issuance of bonds.
b 41. Calculate proceeds from issuance of bonds.

**MULTIPLE CHOICE—CPA Adapted**

<table>
<thead>
<tr>
<th>Answer</th>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>d</td>
<td>42.</td>
<td>Identification of correct compound interest table.</td>
</tr>
<tr>
<td>a</td>
<td>43.</td>
<td>Appropriate use of an ordinary annuity table.</td>
</tr>
<tr>
<td>b</td>
<td>44.</td>
<td>Calculate annual deposit of annuity due.</td>
</tr>
<tr>
<td>a</td>
<td>45.</td>
<td>Calculate the present value of a note.</td>
</tr>
<tr>
<td>a</td>
<td>46.</td>
<td>Calculate the present value of a note.</td>
</tr>
<tr>
<td>c</td>
<td>47.</td>
<td>Calculate interest revenue of a noninterest-bearing note.</td>
</tr>
<tr>
<td>d</td>
<td>48.</td>
<td>Determine the issue price of a bond.</td>
</tr>
<tr>
<td>c</td>
<td>49.</td>
<td>Calculate interest expense of bonds.</td>
</tr>
<tr>
<td>b</td>
<td>50.</td>
<td>Determine the acquisition cost of a franchise.</td>
</tr>
</tbody>
</table>

**EXERCISES**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E6-51</td>
<td>Present and future value concepts.</td>
</tr>
<tr>
<td>E6-52</td>
<td>Present value of an annuity due.</td>
</tr>
<tr>
<td>E6-53</td>
<td>Future value of an annuity due.</td>
</tr>
<tr>
<td>E6-54</td>
<td>Compute goodwill.</td>
</tr>
<tr>
<td>E6-55</td>
<td>Compute the annual rent.</td>
</tr>
<tr>
<td>E6-56</td>
<td>Present value of an investment in equipment.</td>
</tr>
<tr>
<td>E6-57</td>
<td>Calculate the market price of a bond.</td>
</tr>
<tr>
<td>E6-58</td>
<td>Calculate the market price of a bond.</td>
</tr>
</tbody>
</table>

**CHAPTER LEARNING OBJECTIVES**

1. Identify accounting topics where time value of money is relevant.
2. Distinguish between simple and compound interest.
3. Learn how to use appropriate compound interest tables.
4. Identify variables fundamental to solving interest problems.
5. Solve future and present value of 1 problems.
7. Solve present value of ordinary and annuity due problems.

**MULTIPLE CHOICE—Conceptual**

1. Present value is
   a. the value now of a future amount.
   b. the amount that must be invested now to produce a known future value.
   c. always smaller than the future value.
   d. all of these.

2. Which of the following tables would show the largest value for an interest rate of 5% for six periods?
   a. Future value of 1
   b. Present value of 1
   c. Future value of an ordinary annuity of 1
   d. Present value of an ordinary annuity of 1
3. Which table would you use to determine how much you would need to have deposited three years ago at 10% compounded annually in order to have $1,000 today?
   a. Future value of 1 or present value of 1
   b. Future value of an annuity due of 1
   c. Future value of an ordinary annuity of 1
   d. Present value of an ordinary annuity of 1

4. Which table would you use to determine how much must be deposited now in order to provide for 5 annual withdrawals at the beginning of each year, starting one year hence?
   a. Future value of an ordinary annuity of 1
   b. Future value of an annuity due of 1
   c. Present value of an annuity due of 1
   d. None of these

5. Which table has a factor of 1.00000 for 1 period at every interest rate?
   a. Future value of 1
   b. Present value of 1
   c. Future value of an ordinary annuity of 1
   d. Present value of an ordinary annuity of 1

6. Which table would show the largest factor for an interest rate of 8% for five periods?
   a. Future value of an ordinary annuity of 1
   b. Present value of an ordinary annuity of 1
   c. Future value of an annuity due of 1
   d. Present value of an annuity due of 1

7. Which of the following tables would show the smallest factor for an interest rate of 10% for six periods?
   a. Future value of an ordinary annuity of 1
   b. Present value of an ordinary annuity of 1
   c. Future value of an annuity due of 1
   d. Present value of an annuity due of 1

8. An amount is deposited for eight years at 8%. If compounding occurs quarterly, then the table value is found at
   a. 8% for eight periods.
   b. 2% for eight periods.
   c. 8% for 32 periods.
   d. 2% for 32 periods.

9. If the number of periods is known, the interest rate is determined by
   a. dividing the future value by the present value and looking for the quotient in the future value of 1 table.
   b. dividing the future value by the present value and looking for the quotient in the present value of 1 table.
   c. dividing the present value by the future value and looking for the quotient in the future value of 1 table.
   d. multiplying the present value by the future value and looking for the product in the present value of 1 table.
10. The figure .94232 is taken from the column marked 2% and the row marked three periods in a certain interest table. From what interest table is this figure taken?
   a. Future value of 1
   b. Future value of annuity of 1
   c. Present value of 1
   d. Present value of annuity of 1

11. Ed Sloan wants to withdraw $25,000 (including principal) from an investment fund at the end of each year for five years. How should he compute his required initial investment at the beginning of the first year if the fund earns 10% compounded annually?
   a. $25,000 times the future value of a 5-year, 10% ordinary annuity of 1.
   b. $25,000 divided by the future value of a 5-year, 10% ordinary annuity of 1.
   c. $25,000 times the present value of a 5-year, 10% ordinary annuity of 1.
   d. $25,000 divided by the present value of a 5-year, 10% ordinary annuity of 1.

12. Ann Ruth wants to invest a certain sum of money at the end of each year for five years. The investment will earn 6% compounded annually. At the end of five years, she will need a total of $50,000 accumulated. How should she compute her required annual investment?
   a. $50,000 times the future value of a 5-year, 6% ordinary annuity of 1.
   b. $50,000 divided by the future value of a 5-year, 6% ordinary annuity of 1.
   c. $50,000 times the present value of a 5-year, 6% ordinary annuity of 1.
   d. $50,000 divided by the present value of a 5-year, 6% ordinary annuity of 1.

13. Which of the following transactions would require the use of the present value of an annuity due concept in order to calculate the present value of the asset obtained or liability owed at the date of incurrence?
   a. A capital lease is entered into with the initial lease payment due upon the signing of the lease agreement.
   b. A capital lease is entered into with the initial lease payment due one month subsequent to the signing of the lease agreement.
   c. A ten-year 8% bond is issued on January 2 with interest payable semiannually on July 1 and January 1 yielding 7%.
   d. A ten-year 8% bond is issued on January 2 with interest payable semiannually on July 1 and January 1 yielding 9%.

14. Which of the following is true?
   a. Rents occur at the beginning of each period of an ordinary annuity.
   b. Rents occur at the end of each period of an annuity due.
   c. Rents occur at the beginning of each period of an annuity due.
   d. None of these.

15. An accountant wishes to find the present value of an annuity of $1 payable at the beginning of each period at 10% for eight periods. The accountant has only one present value table which shows the present value of an annuity of $1 payable at the end of each period. To compute the present value, the accountant would use the present value factor in the 10% column for
   a. seven periods.
   b. eight periods and multiply by (1 + .10).
   c. eight periods.
   d. nine periods and multiply by (1 – .10).

16. Which statement is false?
   a. The factor for the future value of an annuity due is found by multiplying the ordinary annuity table value by one plus the interest rate.
   b. The factor for the present value of an annuity due is found by multiplying the ordinary annuity table value by one minus the interest rate.
   c. The factor for the future value of an annuity due is found by subtracting 1.00000 from the ordinary annuity table value for one more period.
   d. The factor for the present value of an annuity due is found by adding 1.00000 to the ordinary annuity table value for one less period.

17. If an annuity due and an ordinary annuity have the same number of equal payments and the same interest rates, then
a. the present value of the annuity due is less than the present value of the ordinary annuity.
b. the present value of the annuity due is greater than the present value of the ordinary annuity.
c. the future value of the annuity due is equal to the future value of the ordinary annuity.
d. the future value of the annuity due is less than the future value of the ordinary annuity.

18. Which of the following is false?
   a. The future value of a deferred annuity is the same as the future value of an annuity not deferred.
   b. A deferred annuity is an annuity in which the rents begin after a specified number of periods.
   c. To compute the present value of a deferred annuity, we compute the present value of an ordinary annuity of 1 for the entire period and subtract the present value of the rents which were not received during the deferral period.
   d. If the first rent is received at the end of the sixth period, it means the ordinary annuity is deferred for six periods.

Multiple Choice Answers—Conceptual
1. d 4. d 7. b 10. c 13. a 16. b  
2. c 5. c 8. d 11. c 14. c 17. b  
3. a 6. c 9. a 12. b 15. b 18. d

Solution to Multiple Choice question for which the answer is “none of these.”

4. Present value of an Ordinary Annuity of 1.

MULTIPLE CHOICE—Computational

Items 19 through 22 apply to the appropriate use of interest tables. Given below are the future value factors for 1 at 8% for one to five periods. Each of the items 19 to 22 is based on 8% interest compounded annually.

<table>
<thead>
<tr>
<th>Periods</th>
<th>Future Value of 1 at 8%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.080</td>
</tr>
<tr>
<td>2</td>
<td>1.166</td>
</tr>
<tr>
<td>3</td>
<td>1.260</td>
</tr>
<tr>
<td>4</td>
<td>1.360</td>
</tr>
<tr>
<td>5</td>
<td>1.469</td>
</tr>
</tbody>
</table>

19. What amount should be deposited in a bank account today to grow to $10,000 three years from today?
   a. $10,000 \times 1.260  
   b. $10,000 \times 1.260 \times 3  
   c. $10,000 \div 1.260  
   d. $10,000 \div 1.080 \times 3

20. If $5,000 is put in a savings account today, what amount will be available three years from today?
   a. $5,000 \times 1.260  
   b. $5,000 \times 1.260  
   c. $5,000 \times 1.080 \times 3  
   d. ($5,000 \times 1.080) + ($5,000 \times 1.166) + ($5,000 \times 1.260)

21. What amount will be in a bank account three years from now if $8,000 is invested each year for four years with the first investment to be made today?
   a. ($8,000 \times 1.260) + ($8,000 \times 1.166) + ($8,000 \times 1.080) + $8,000  
   b. $8,000 \times 1.360 \times 4  
   c. ($8,000 \times 1.080) + ($8,000 \times 1.166) + ($8,000 \times 1.260) + ($8,000 \times 1.360)  
   d. $8,000 \times 1.080 \times 4

22. If $6,000 is put in a savings account today, what amount will be available six years from now?
   a. $6,000 \times 1.080 \times 6  
   b. $6,000 \times 1.080 \times 1.469  
   c. $6,000 \times 1.166 \times 3  
   d. $6,000 \times 1.260 \times 2

Items 23 through 26 apply to the appropriate use of present value tables. Given below are the present value factors for $1.00 discounted at 10% for one to five periods. Each of the items 23 to 26 is based on 10% interest compounded annually.
23. If an individual put $5,000 in a savings account today, what amount of cash would be available two years from today?
a. $5,000 × 0.826
b. $5,000 × 0.826 ²
c. $5,000 ÷ 0.826
d. $5,000 ÷ 0.909 ²

24. What is the present value today of $8,000 to be received six years from today?
a. $8,000 × 0.909 × 6
b. $8,000 × 0.751 × 2
c. $8,000 × 0.621 × 0.909
d. $8,000 × 0.683 × 3

25. What amount should be deposited in a bank today to grow to $6,000 three years from today?
a. $6,000 ÷ 0.751
b. $6,000 × 0.909 × 3
c. ($6,000 × 0.909) + ($6,000 × 0.826) + ($6,000 × 0.751)
d. $6,000 × 0.751

26. What amount should an individual have in a bank account today before withdrawal if $10,000 is needed each year for four years with the first withdrawal to be made today and each subsequent withdrawal at one-year intervals? (The balance in the bank account should be zero after the fourth withdrawal.)
a. $10,000 + ($10,000 × 0.909) + ($10,000 × 0.826) + ($10,000 × 0.751)
b. $10,000 × 0.683 × 4
c. ($10,000 × 0.909) + ($10,000 × 0.826) + ($10,000 × 0.751) + ($10,000 × 0.683)
d. $10,000 × 0.909 × 4

27. If a savings account pays interest at 4% compounded quarterly, then the amount of $1 left on deposit for 6 years would be found in a table using
a. 6 periods at 4%.
b. 6 periods at 1%.
c. 24 periods at 4%.
d. 24 periods at 1%.

28. At the end of two years, what will be the balance in a savings account paying 6% annually if $10,000 is deposited today? The future value of one at 6% for one period is 1.06.
a. $10,000
b. $10,600
c. $11,200
d. $11,236

29. On January 1, 2001, the Carly Company decided to begin accumulating a fund for asset replacement five years later. The company plans to make five annual deposits of $20,000 at 9% each January 1 beginning in 2001. What will be the balance in the fund, within $10, on January 1, 2006 (one year after the last deposit)? The following 9% interest factors may be used.

<table>
<thead>
<tr>
<th>Present Value of Ordinary Annuity</th>
<th>Future Value of Ordinary Annuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 periods</td>
<td>3.2397</td>
</tr>
<tr>
<td>5 periods</td>
<td>3.8897</td>
</tr>
<tr>
<td>6 periods</td>
<td>4.4859</td>
</tr>
</tbody>
</table>

a. $130,466
b. $119,694
c. $109,000
d. $100,000

30. How much must be deposited on January 1, 2000 in a savings account paying 6% annually in order to make annual withdrawals of $3,000 at the end of the years 2000 and 2001? The present value of one at 6% for one period is .9434.
   a. $5,500
   b. $5,661
   c. $6,000
   d. $2,670

31. How much must be invested now to receive $20,000 for 15 years if the first $20,000 is received today and the rate is 9%?

<table>
<thead>
<tr>
<th>Periods</th>
<th>Present Value of Ordinary Annuity at 9%</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>7.78615</td>
</tr>
<tr>
<td>15</td>
<td>8.06069</td>
</tr>
<tr>
<td>16</td>
<td>8.31256</td>
</tr>
</tbody>
</table>

   a. $161,214
   b. $175,723
   c. $300,000
   d. $146,251

Use the following 8% interest factors for questions 32 through 35.

<table>
<thead>
<tr>
<th>Periods</th>
<th>Present Value of Ordinary Annuity</th>
<th>Future Value of Ordinary Annuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 periods</td>
<td>5.2064</td>
<td>8.92280</td>
</tr>
<tr>
<td>8 periods</td>
<td>5.7466</td>
<td>10.63663</td>
</tr>
<tr>
<td>9 periods</td>
<td>6.2469</td>
<td>12.48756</td>
</tr>
</tbody>
</table>

32. What will be the balance on September 1, 2007 in a fund which is accumulated by making $12,000 annual deposits each September 1 beginning in 2000, with the last deposit being made on September 1, 2007? The fund pays interest at 8% compounded annually.
   a. $127,640
   b. $107,074
   c. $90,720
   d. $68,959

33. If $8,000 is deposited annually starting on January 1, 2001 and it earns 8%, what will the balance be on December 31, 2008?
   a. $71,382
   b. $77,093
   c. $85,093
   d. $91,901

34. Henson Company wishes to accumulate $200,000 by May 1, 2009 by making 8 equal annual deposits beginning May 1, 2001 to a fund paying 8% interest compounded annually. What is the required amount of each deposit?
   a. $34,803
   b. $18,803
   c. $17,410
   d. $20,156

35. What amount should be recorded as the cost of a machine purchased December 31, 2000, which is to be financed by making 8 annual payments of $9,000 each beginning December 31, 2001? The applicable interest rate is 8%.
   a. $63,000
   b. $56,222
   c. $95,730
   d. $51,719

36. Foxx Company financed the purchase of a machine by making payments of $6,000 at the end of each of five years. The appropriate rate of interest was 8%. The future value of one for five periods at 8% is 1.46933. The future value of an ordinary annuity for five periods at 8% is
5.8666. The present value of an ordinary annuity for five periods at 8% is 3.99271. What was the cost of the machine to Foxx?
a. $8,816
b. $23,956
c. $30,000
d. $35,200

37. A machine is purchased by making payments of $8,000 at the beginning of each of the next five years. The interest rate was 10%. The future value of an ordinary annuity of 1 for five periods is 6.10510. The present value of an ordinary annuity of 1 for five periods is 3.79079. What was the cost of the machine?
a. $53,725
b. $48,841
c. $33,359
d. $30,326

38. Cline Co. has a machine that cost $300,000. It is to be leased for 20 years with rent received at the beginning of each year. Cline wants a return of 10%. Calculate the amount of the annual rent.

<table>
<thead>
<tr>
<th>Period</th>
<th>Present Value of Ordinary Annuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>8.36492</td>
</tr>
<tr>
<td>20</td>
<td>8.51356</td>
</tr>
<tr>
<td>21</td>
<td>8.64869</td>
</tr>
</tbody>
</table>

a. $32,034
b. $35,864
c. $44,592
d. $35,238

39. Find the present value of an investment in plant and equipment if it is expected to provide annual earnings of $42,000 for 15 years and to have a resale value of $80,000 at the end of that period. Assume a 10% rate and earnings at year end. The present value of 1 at 10% for 15 periods is .23939. The present value of an ordinary annuity at 10% for 15 periods is 7.60608. The future value of 1 at 10% for 15 periods is 4.17725.
a. $319,456
b. $338,606
c. $370,552
d. $649,152

40. On January 2, 2001, Vick Corporation wishes to issue $300,000 (par value) of its 8%, 10-year bonds. The bonds pay interest annually on January 1. The current yield rate on such bonds is 10%. Using the interest factors below, compute the amount that Vick will realize from the sale (issuance) of the bonds.

| Present value of 1 at 8% for 10 periods | 0.4632 |
| Present value of 1 at 10% for 10 periods | 0.3855 |
| Present value of an ordinary annuity at 8% for 10 periods | 6.7101 |
| Present value of an ordinary annuity at 10% for 10 periods | 6.1446 |

a. $300,000
b. $263,120
c. $300,002
d. $331,808

Note: Students must be given interest tables for question 41.

41. The market price of a $400,000, ten-year, 12% (pays interest semiannually) bond issue sold to yield an effective rate of 10% is
a. $449,156.
b. $449,850.
c. $453,308.
d. $748,944.

Multiple Choice Answers—Computational
MULTIPLE CHOICE—CPA Adapted

42. On May 1, 2001 a company purchased a new machine which it does not have to pay for until May 1, 2003. The total payment on May 1, 2003 will include both principal and interest. Assuming interest at a 10% rate, the cost of the machine would be the total payment multiplied by what time value of money factor?
   a. Future value of annuity of 1
   b. Future value of 1
   c. Present value of annuity of 1
   d. Present value of 1

43. For which of the following transactions would the use of the present value of an ordinary annuity concept be appropriate in calculating the present value of the asset obtained or the liability owed at the date of incurrence?
   a. A capital lease is entered into with the initial lease payment due one month subsequent to the signing of the lease agreement.
   b. A capital lease is entered into with the initial lease payment due upon the signing of the lease agreement.
   c. A ten-year 8% bond is issued on January 2 with interest payable semiannually on January 2 and July 1 yielding 7%.
   d. A ten-year 8% bond is issued on January 2 with interest payable semiannually on January 2 and July 1 yielding 9%.

44. On January 15, 2001, Elgin Corp. adopted a plan to accumulate funds for environmental improvements beginning July 1, 2005, at an estimated cost of $1,500,000. Elgin plans to make four equal annual deposits in a fund that will earn interest at 10% compounded annually. The first deposit was made on July 1, 2001. Future value factors are as follows:

<table>
<thead>
<tr>
<th>Time (Periods)</th>
<th>Future Value of 1 at 10%</th>
<th>Future Value of Ordinary Annuity of 1 at 10%</th>
<th>Future Value of Annuity Due of 1 at 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1.61</td>
<td>4.64</td>
<td>5.11</td>
</tr>
</tbody>
</table>

Elgin should make four annual deposits (rounded) of
   a. $266,820.
   b. $293,520.
   c. $323,280.
   d. $375,000.

45. On December 30, 2001, Dye, Inc. purchased a machine from Frank Corp. in exchange for a noninterest-bearing note requiring eight payments of $20,000. The first payment was made on December 30, 2001, and the others are due annually on December 30. At date of issuance, the prevailing rate of interest for this type of note was 11%. Present value factors are as follows:

<table>
<thead>
<tr>
<th>Period</th>
<th>Present Value of Ordinary Annuity of 1 at 11%</th>
<th>Present Value of Annuity Due of 1 at 11%</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>4.712</td>
<td>5.231</td>
</tr>
<tr>
<td>8</td>
<td>5.146</td>
<td>5.712</td>
</tr>
</tbody>
</table>

On Dye's December 31, 2001 balance sheet, the net note payable to Frank is
   a. $94,240.
   b. $102,920.
   c. $104,620.
   d. $114,240.
46. On January 1, 2001, Marx Co. sold goods to Cox Company. Cox signed a noninterest-bearing note requiring payment of $30,000 annually for seven years. The first payment was made on January 1, 2001. The prevailing rate of interest for this type of note at date of issuance was 10%. Information on present value factors is as follows:

<table>
<thead>
<tr>
<th>Period</th>
<th>Present Value of 1 at 10%</th>
<th>Present Value of Ordinary Annuity of 1 at 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>.5645</td>
<td>4.3553</td>
</tr>
<tr>
<td>7</td>
<td>.5132</td>
<td>4.8684</td>
</tr>
</tbody>
</table>

Marx should record sales revenue in January 2001 of (rounded)

a. $160,660.

b. $146,050.

c. $130,660.

d. $107,100.

47. On January 1, 2001, Cox Co. exchanged equipment for a $120,000 noninterest-bearing note due on January 1, 2004. The prevailing rate of interest for a note of this type at January 1, 2001 was 10%. The present value of $1 at 10% for three periods is 0.75. What amount of interest revenue should be included in Cox's 2002 income statement?

a. $0

b. $9,000

c. $9,900

d. $12,000

48. On January 1, 2001, Grant Co. issued ten-year bonds with a face amount of $3,000,000 and a stated interest rate of 8% payable annually on January 1. The bonds were priced to yield 10%. Present value factors are as follows:

<table>
<thead>
<tr>
<th>Present value of 1 for 10 periods</th>
<th>At 8%</th>
<th>At 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.463</td>
<td>0.386</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Present value of an ordinary annuity of 1 for 10 periods</th>
<th>At 8%</th>
<th>At 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.710</td>
<td>6.145</td>
</tr>
</tbody>
</table>

The total issue price (rounded) of the bonds was

a. $3,000,000.

b. $2,940,000.

c. $2,760,000.

d. $2,632,800.

49. On January 1, 2001, Lank Co. sold to Day Corp. $400,000 of its 10% bonds for $354,118 to yield 12%. Interest is payable semiannually on January 1 and July 1. What amount should Lank report as interest expense for the six months ended June 30, 2001?

a. $17,706

b. $20,000

c. $21,247

d. $24,000

50. On July 1, 2001, Ed Yates signed an agreement to operate as a franchisee of Kwik Foods, Inc., for an initial franchise fee of $60,000. Of this amount, $20,000 was paid when the agreement was signed and the balance is payable in four equal annual payments of $10,000 beginning July 1, 2002. The agreement provides that the down payment is not refundable and no future services are required of the franchisor. Yates’ credit rating indicates that he can borrow money at 14% for a loan of this type. Information on present and future value factors is as follows:

<table>
<thead>
<tr>
<th>Present value of 1 at 14% for 4 periods</th>
<th>0.59</th>
</tr>
</thead>
<tbody>
<tr>
<td>Future value of 1 at 14% for 4 periods</td>
<td>1.69</td>
</tr>
<tr>
<td>Present value of an ordinary annuity of 1 at 14% for 4 periods</td>
<td>2.91</td>
</tr>
</tbody>
</table>

Yates should record the acquisition cost of the franchise on July 1, 2001 at

a. $43,600.

b. $49,100.

c. $60,000.

d. $67,600.
### Multiple Choice Answers—CPA Adapted

<table>
<thead>
<tr>
<th>No.</th>
<th>Answer</th>
<th>Derivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>42.</td>
<td>d</td>
<td>Conceptual.</td>
</tr>
<tr>
<td>44.</td>
<td>b</td>
<td>Conceptual.</td>
</tr>
<tr>
<td>46.</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>48.</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>50.</td>
<td>b</td>
<td></td>
</tr>
<tr>
<td>43.</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>45.</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>47.</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>49.</td>
<td>c</td>
<td></td>
</tr>
</tbody>
</table>

### DERIVATIONS — Computational

<table>
<thead>
<tr>
<th>No.</th>
<th>Answer</th>
<th>Derivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.</td>
<td>c</td>
<td>$1.260 \times PV = $10,000; PV = $10,000 \div 1.260.</td>
</tr>
<tr>
<td>20.</td>
<td>b</td>
<td>$1.260 \times $5,000.</td>
</tr>
<tr>
<td>21.</td>
<td>a</td>
<td>$(8,000 \times 1.260) + (8,000 \times 1.166) + (8,000 \times 1.080) + 8,000.</td>
</tr>
<tr>
<td>22.</td>
<td>b</td>
<td>$6,000 \times (1.080)^6 \text{ or } 6,000 \times 1.469 \times 1.080.</td>
</tr>
<tr>
<td>23.</td>
<td>c</td>
<td>$0.826 \times PV = $5,000; PV = $5,000 \div 0.826.</td>
</tr>
<tr>
<td>24.</td>
<td>c</td>
<td>$8,000 \times 0.621 \times 0.909.</td>
</tr>
<tr>
<td>25.</td>
<td>d</td>
<td>$6,000 \times 0.751.</td>
</tr>
<tr>
<td>26.</td>
<td>a</td>
<td>$10,000 + ($10,000 \times 0.909) + ($10,000 \times 0.826) + ($10,000 \times 0.751).</td>
</tr>
<tr>
<td>27.</td>
<td>d</td>
<td>$4 \times 6 = 24 \text{ periods; } 4% + 4% = 1%.</td>
</tr>
<tr>
<td>28.</td>
<td>d</td>
<td>$10,000 \times (1.06)^2 = 11,236.</td>
</tr>
<tr>
<td>29.</td>
<td>a</td>
<td>$20,000 \times (7.5233 - 1) = $130,466 \text{ or } 20,000 \times 5.9847 \times 1.09.</td>
</tr>
<tr>
<td>30.</td>
<td>a</td>
<td>$(3,000 \times 0.9434) + [(3,000 \times (0.9434)^2] = 5,500.</td>
</tr>
<tr>
<td>31.</td>
<td>b</td>
<td>$20,000 \times (7.78615 + 1) = 175,723 \text{ or } 20,000 \times 8.06069 \times 1.09.</td>
</tr>
<tr>
<td>32.</td>
<td>a</td>
<td>$12,000 \times 10.6366 = 127,640.</td>
</tr>
<tr>
<td>33.</td>
<td>d</td>
<td>$8,000 \times (12.4876 - 1) = 91,901 \text{ or } 8,000 \times 10.6366 \times 1.08.</td>
</tr>
<tr>
<td>34.</td>
<td>c</td>
<td>$(10.63663 \times 1.08) \times R = 200,000; R = 200,000 \div 11.48756 = 17,410.</td>
</tr>
<tr>
<td>35.</td>
<td>d</td>
<td>$9,000 \times 5.7466 = 51,719.</td>
</tr>
<tr>
<td>36.</td>
<td>b</td>
<td>$6,000 \times 3.99271 = 23,956.</td>
</tr>
<tr>
<td>37.</td>
<td>c</td>
<td>$8,000 \times (3.79079 \times 1.10) = 8,000 \times 4.16987 = 33,359.</td>
</tr>
<tr>
<td>38.</td>
<td>a</td>
<td>$300,000 = R \times (8.51356 \times 1.10); R = 300,000 \div 9.36492 = 32,034.</td>
</tr>
<tr>
<td>39.</td>
<td>b</td>
<td>$(42,000 \times 7.60608) + (80,000 \times .23939) = 338,606.</td>
</tr>
<tr>
<td>40.</td>
<td>b</td>
<td>$300,000 \times .08 = 24,000 \text{ (annual interest payment)} \times (24,000 \times 6.1446) + (300,000 \times 0.3855) = 263,120.</td>
</tr>
<tr>
<td>41.</td>
<td>b</td>
<td>$400,000 \times .06 = 24,000 \text{ (semiannual interest payment)} \times (24,000 \times 12.46221) + (400,000 \times .37689) = 449,850.</td>
</tr>
</tbody>
</table>

### DERIVATIONS — CPA Adapted

<table>
<thead>
<tr>
<th>No.</th>
<th>Answer</th>
<th>Derivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>42.</td>
<td>d</td>
<td>Conceptual.</td>
</tr>
<tr>
<td>43.</td>
<td>a</td>
<td>Conceptual.</td>
</tr>
<tr>
<td>44.</td>
<td>b</td>
<td>$5.11 \times R = $1,500,000; R = $1,500,000 \div 5.11 = 293,542.</td>
</tr>
<tr>
<td>45.</td>
<td>a</td>
<td>$20,000 \times 4.712 = 94,240 \text{ or } (20,000 \times 5.712) - 20,000 = 94,240.</td>
</tr>
</tbody>
</table>
46. a \(30,000 \times (4.8684 \times 1.1) = 160,660\) or \((30,000 \times 4.3553) + 30,000 = 160,660\).

47. c \(120,000 \times .75 = 90,000\) (present value of note)
\(90,000 \times 1.10 = 99,000\); \(99,000 \times 0.10 = 9,900\).

48. d \(3,000,000 \times .08 = 240,000\)
\((240,000 \times 6.145) + (3,000,000 \times 0.386) = 2,632,800\).

49. c \(354,118 \times .06 = 21,247\).

50. b \((10,000 \times 2.91) + 20,000 = 49,100\).

**EXERCISES**

**Ex. 6-51**—Present and future value concepts.

On the right are six diagrams representing six different present and future value concepts stated on the left. Identify the diagrams with the concepts by writing the identifying letter of the diagram on the blank line at the left. Assume \(n = 4\) and \(i = 8\%\).

<table>
<thead>
<tr>
<th>Concept</th>
<th>Diagram of Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Future value of 1.</td>
<td>a. $1</td>
</tr>
<tr>
<td>2. Present value of 1.</td>
<td>b. $1 $1 $1 $1</td>
</tr>
<tr>
<td>3. Future value of an annuity due of 1.</td>
<td>c. $1 $1 $1 $1</td>
</tr>
<tr>
<td>4. Future value of an ordinary annuity of 1.</td>
<td>d. $1 $1 $1 $1</td>
</tr>
<tr>
<td>5. Present value of an ordinary annuity of 1.</td>
<td>e. $1 ?</td>
</tr>
<tr>
<td>6. Present value of an annuity due of 1.</td>
<td>f. $1 $1 $1 $1 ?</td>
</tr>
</tbody>
</table>

**Solution 6-51**

1. e  2. a  3. f  4. b  5. d  6. c

**Ex. 6-52**—Present value of an annuity due. (Tables needed.)

How much must be invested now to receive \$20,000 for ten years if the first \$20,000 is received today and the rate is 8\%?

**Solution 6-52**

Present value of an annuity due of \$20,000 for ten periods at 8\% \((20,000 \times 7.24689) = 144,938\).

**Ex. 6-53**—Future value of an annuity due. (Tables needed.)
If $6,000 is deposited annually starting on January 1, 2001 and it earns 9%, how much will accumulate by December 31, 2010?

**Solution 6-53**
Future value of an annuity due of $6,000 for 10 periods at 9%

\[(6,000 \times 15.19293 \times 1.09) = 99,362.\]

**Ex. 6-54**—Compute goodwill. (Tables needed.)

Compute goodwill if it is found by discounting excess earnings at 10% compounded quarterly. Excess annual earnings of $16,000 are expected for 8 years.

**Solution 6-54**
Present value of $4,000 for 32 periods at 2.5% 

\[(4,000 \times 21.84918) = 87,397.\]

**Ex. 6-55**—Compute the annual rent. (Tables needed.)

Carey Co. has machinery that cost $60,000. It is to be leased for 15 years with rent received at the beginning of each year. Carey wants a return of 10%. Compute the amount of the annual rent.

**Solution 6-55**
Present value factor for an annuity due for 15 periods at 10%

\[60,000 \div 8.36669 = 7,171.\]

**Ex. 6-56**—Present value of an investment in equipment. (Tables needed.)

Find the present value of an investment in equipment if it is expected to provide annual savings of $8,000 for 10 years and to have a resale value of $20,000 at the end of that period. Assume an interest rate of 9% and that savings are realized at year end.

**Solution 6-56**

Present value of $8,000 for 10 periods at 9% 

\[6.41766 \times 8,000 = 51,341\]

Present value of $20,000 discounted for 10 periods at 9%

\[.42241 \times 20,000 = 8,448\]

Present value of investment in equipment

\[59,789\]

**Ex. 6-57**—Calculate market price of a bond. (Tables needed.)

Determine the market price of a $500,000, ten-year, 10% (pays interest semiannually) bond issue sold to yield an effective rate of 12%.

**Solution 6-57**

Present value of $25,000 for 20 periods at 6% 

\[25,000 \times 11.46992 = 286,748\]

Present value of $500,000 discounted for 20 periods at 6%

\[500,000 \times .31180 = 155,900\]

Market price of the bond issue

\[442,648\]

**Ex. 6-58**—Calculate market price of a bond.

On January 1, 2001 Kiner Co. issued five-year bonds with a face value of $300,000 and a stated interest rate of 12% payable semiannually on July 1 and January 1. The bonds were sold to yield 10%. Present value table factors are:

Present value of 1 for 5 periods at 10% 

\[.62092\]
<table>
<thead>
<tr>
<th>Description</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present value of 1 for 5 periods at 12%</td>
<td>.56743</td>
</tr>
<tr>
<td>Present value of 1 for 10 periods at 5%</td>
<td>.61391</td>
</tr>
<tr>
<td>Present value of 1 for 10 periods at 6%</td>
<td>.55839</td>
</tr>
<tr>
<td>Present value of an ordinary annuity of 1 for 5 periods at 10%</td>
<td>3.79079</td>
</tr>
<tr>
<td>Present value of an ordinary annuity of 1 for 5 periods at 12%</td>
<td>3.60478</td>
</tr>
<tr>
<td>Present value of an ordinary annuity of 1 for 10 periods at 5%</td>
<td>7.72173</td>
</tr>
<tr>
<td>Present value of an ordinary annuity of 1 for 10 periods at 6%</td>
<td>7.36009</td>
</tr>
</tbody>
</table>

Calculate the issue price of the bonds.

**Solution 6-58**

Present value of $300,000 discounted for 10 periods at 5% ($300,000 × .61391) = $184,173

Present value of $18,000 for 10 periods at 5% ($18,000 × 7.72173) = 138,991

Issue price of the bonds $323,164