# CHAPTER 10

## DISCUSSION QUESTIONS

**1.** Present values are less when discount rates are high as compared to when they are low. This is because the interest owed or the discount reported is proportionate to the interest rate. That is, a company cannot borrow as much money on high-interest-paying loans as on low-interest-paying loans and yet could be required to pay the same periodic amount to satisfy the terms of the loan.

**2.** An annuity is a series of cash flows of equal amounts at equal time intervals. These cash flows can either be paid or received.

**3.** The stated amount of a liability equals its present value when the market rate of interest is equal to the stated rate of interest associated with the liability. For example, if a bank issues a two-year, $1,000, 8% note to a company when the market rate of interest is 8%, then the present value computations will result in a present value of $1,000—the same as the face amount of the note.

**4.** A note payable is an obligation to pay a specified sum of money on or before some future date, whereas a mortgage payable is a liability that is usually paid in periodic (monthly) installments. Also, a mortgage payable is usually secured by the asset that was purchased with the borrowed money.

**5.** For each mortgage payment, a portion is interest, and the remainder is applied to reduce the principal. To compute that amount attributable to principal, the outstanding loan balance is multiplied by the monthly interest rate. The result is the interest portion of the payment. Subtracting this amount from the total payment gives the amount applied to reduce the principal.

**6.** Companies usually sell bonds through underwriters to individuals, other companies, pension funds, insurance companies, universities, or other institutions that perceive bonds to be an attractive investment.   
Because bonds are usually sold in small denominations, almost anyone can buy them.

**7.** Two important factors in determining the issuance price of a bond are (1) the market rate of interest and (2) the length of time until the maturity of the bonds. The market rate of interest determines the effective cost of borrowing per period. The period until the maturity of the bonds determines the length of time over which the face value and the interest payments are discounted in arriving at the bond issuance price.

**8.** Bonds can mature or be eliminated as follows:

**a.** Term bonds mature in one single sum on a specified future date.

**b.** Serial bonds mature in a series of installments.

**c.** Callable bonds are term or serial bonds that the issuer can redeem or call at any time at a specified price.

**d.** Convertible bonds are term or serial bonds that can be converted to other securities, such as stocks, after a specified time at the option of the bondholder.

**9.** If a bond’s stated interest rate is below the market interest rate, it will usually sell at a discount. The lower issuance price would increase the bond’s yield rate to the market rate of interest.

**10.** If you thought the market rate of interest was going to drop in the near future, it would probably be wise to invest in bonds because, as the market rate of interest drops, bonds usually increase in price. Everyone wants a higher-paying interest investment.

**11.** Bonds will sell at or near face value in at least two instances: (1) when the stated rate of interest on the bonds is equal to the market rate of interest, and investment in the firm is no more or less risky than it is in other bond issuers; and (2) when the bond nears maturity, because on the maturity date the face value of the bond will be paid to bondholders.

**12.** The retirement of bonds before maturity may result in a gain or a loss because the price paid to retire the bonds is greater (loss) or less (gain) than the carrying amount of the bonds on that date. The price paid to retire the bonds may be different from the carrying amount of the bonds because the effective rate of interest for current investments and the stated rate of interest on the bonds may be in a different relationship to each other than when the bonds were issued.

**13.** The debt ratio is calculated by dividing total liabilities by total assets. It measures the percentage of total assets in an organization that were financed by debt or by borrowing money.

**14.** From the standpoint of a lender, a high times interest earned ratio is more attractive than a low times interest earned ratio. The magnitude of the times interest earned ratio indicates how much cushion a company has in making its interest payments; the higher the ratio, the less likely the company will be unable to make its interest payments.

## PRACTICE EXERCISES

PE 10–1 (LO1) Present Value of a Single Amount

Amount of payment $ 50,000

Present value factor of $1 to be paid in 5 periods at 8%

interest (from Table I, Appendix D) × 0.6806

Present value of payment $ 34,030

### PE 10–2 (LO1) Future Value of a Single Amount

Present value in savings account $ 75,000

Future value factor of $1 to be paid in 10 periods at 10%

interest (Table III, Appendix D) × 2.5937

Future value $ 194,528 (rounded)

### PE 10–3 (LO1) Interest Rate per Compounding Period

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Interest rate per  compounding period | = |  | = |  | = 4% |
|  |  |  |  |  |  |

### PE 10–4 (LO1) Number of Interest Periods

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Number of  interest periods | = | Compounding  periods per year | = | Number  of years | = | 12 × 7 = 84 periods |

### PE 10–5 (LO1) Future Value of Single Amount Compounded Monthly

Present value in savings account $ 16,000

Future value factor of $1 to be paid in 60 periods at 1%

interest (Table III, Appendix D) × 1.8167

Future value $29,067 (rounded)

PE 10–6 (LO1) Computing the Present Value of an Annuity

Amount of semiannual payment $ 1,600

Present value factor of an annuity of $1 discounted for

16 payments at 5% (Table II, Appendix D) × 10.8378

Present value of payments $ 17,340 (rounded)

PE 10–7 (LO1) Computing Periodic Payment Amount

Amount of monthly payment Payment

Present value factor of an annuity of $1 discounted for

60 payments at 1% (Table II, Appendix D) × 44.9550

Present value of payments $ 80,000

In equation format, this can be written as follows:

$80,000 = Payment × 44.9550

Payment = $80,000/44.9550

Payment = $1,779.56 (rounded)

### PE 10–8 (LO2) Interest-Bearing Notes

1. Cash 30,000

Notes Payable 30,000

*Borrowed $30,000 at 8% interest for seven years.*

2. Interest Expense 2,400

Cash 2,400

*Made first annual interest payment on note*

*($30,000 × 0.08).*

### PE 10–9 (LO2) Mortgages Payable Issuance and First Payment

1. Building 1,000,000

Mortgage Payable 1,000,000

*Borrowed $1,000,000 to purchase building.*

2. Mortgage Payable ($8,776 – $8,333.33) 442.67

Interest Expense [($1,000,000 × 0.10)/12] 8,333.33

Cash 8,776

*Made first month’s mortgage payment.*

### PE 10–10 (LO2) Mortgages Payable Second Payment

Feb. 28 Mortgage Payable ($8,776 – $8,329.64) 446.36

Interest Expense

{[($1,000,000 – $442.67) × 0.10]/12} 8,329.64

Cash 8,776.00

*Made second month’s mortgage payment.*

### PE 10–11 (LO3) Types of Bonds

The correct answer is B. Serial bonds mature in a series of installments, whereas term bonds mature in one single sum on a specified future date.

### PE 10–12 (LO3) Bonds Issued at Face Value

Quarterly interest payments $ 2,000

Present value of an annuity of 60

payments of $1 at 2% (Table II, Appendix D) × 34.7609

Present value of interest payments $ 69,522

Maturity value of bonds $ 100,000

Present value of $1 received 60 periods

in the future discounted at 2% (Table I, Appendix D) × 0.3048

Present value of principal amount 30,480

Issuance price of bonds (total present value) $100,002\*

\*Difference is due to the rounding of the present value factor.

### PE 10–13 (LO3) Bonds Issued at a Discount

Semiannual interest payments $ 1,000

Present value of an annuity of 10

payments of $1 at 6% (Table II, Appendix D) × 7.3601

Present value of interest payments $ 7,360

Maturity value of bonds $ 25,000

Present value of $1 received 10 periods

in the future discounted at 6% (Table I, Appendix D) × 0.5584

Present value of principal amount 13,960

Issuance price of bonds (total present value) $21,320

### PE 10–14 (LO3) Bonds Issued at a Premium

Semiannual interest payments $ 4,000

Present value of an annuity of 14

payments of $1 at 3% (Table II, Appendix D) × 11.2961

Present value of interest payments $ 45,184

Maturity value of bonds $ 100,000

Present value of $1 received 14 periods

in the future discounted at 3% (Table I, Appendix D) × 0.6611

Present value of principal amount 66,110

Issuance price of bonds (total present value) $111,294

### PE 10–15 (LO3) Accounting for Bonds Payable Issued at Face Value

1. Cash 800,000

Bonds Payable 800,000

*Issued $800,000, 9%, 20-year bonds at face value.*

2. Bond Interest Expense 36,000

Cash 36,000

*Paid semiannual interest on the $800,000, 9%,*

*20-year bonds ($800,000 × 0.09 × ½ year).*

### PE 10–16 (LO3) Accounting for Retirement of Bonds Payable Issued at Face Value

Bonds Payable 800,000

Cash 800,000

*Retired the $800,000, 9%, 20-year bonds.*

### PE 10–17 (LO3) Bond Retirements before Maturity

Bonds Payable 300,000

Loss on Bond Retirement 18,000

Cash.. 318,000

*To retire $300,000 of bonds at a call price of 106.*

### PE 10–18 (LO4) Debt Ratio

Debt ratio =  =  = 41.18%

### PE 10–19 (LO4) Debt-to-Equity Ratio

Debt-to-equity ratio = Total liabilities/Total equity =  = 0.7

\*Total equity = Total assets – Total liabilities ($850,000 – $350,000 = $500,000).

### PE 10–20 (LO4) Times Interest Earned Ratio

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Times interest earned ratio | = |  | = |  | = 10.67 times |

## EXERCISES

E 10–1 (LO1) Computing the Present Value of a Single Sum

All present value factors are from Table I, Appendix D.

1. $ 60,000 × 0.7921 = $47,526 (6% for 4 periods)

2. $ 15,000 × 0.7730 = $11,595 (2% for 13 periods)

3. $ 76,000 × 0.4564 = $34,686 (4% for 20 periods)

4. $ 85,000 × 0.0872 = $ 7,412 (5% for 50 periods)

### E 10–2 (LO1) Computing the Future Value of a Single Sum

All future value factors are from Table III, Appendix D.

1. $15,842 × 1.2625 = $20,001 (6% for 4 periods)

2. $30,920 × 1.2936 = $39,998 (2% for 13 periods)

3. $ 6,846 × 2.1911 = $15,000 (4% for 20 periods)

4. $ 959 × 11.467 = $10,997 (5% for 50 periods)

### E 10–3 (LO1) Computing the Present Value of an Annuity

Present value factors are from Table II, Appendix D.

1. $50,000 × 3.9927 = $199,635 (8% for 5 payments)

2. $50,000 × 3.7908 = $189,540 (10% for 5 payments)

### E 10–4 (LO1) Computing the Amount of Periodic Payments

1. PVANN = Payment [PVANN Factor (Table II, Appendix D): n = ?, i = ?]

$250,000 = Payment [PVANN Factor (Table II, Appendix D): n = 4, i = 8%]

$250,000 = Payment [3.3121]

Payment = $250,000/3.3121

Payment = $75,481

2. PVANN = Payment [PVANN Factor (Table II, Appendix D): n = ?, i = ?]

$250,000 = Payment [PVANN Factor (Table II, Appendix D): n = 8, i = 7%]

$250,000 = Payment [5.9713]

Payment = $250,000/5.9713

Payment = $41,867

### E 10-5 (LO1) Evaluation of Statements about Bonds.

1. False. When seeking long-term financing, an advantage of issuing bonds over issuing ordinary shares is that tax savings result.
2. True.
3. True.
4. True.

### E 10–6 (LO2) Accounting for Long-Term Note Payable

2017

Oct. 1 Cash 60,000

Notes Payable 60,000

*Borrowed $60,000 on a two-year, 8% note.*

Dec. 31 Interest Expense 1,200

Interest Payable 1,200

*To record three months’ interest expense*

*on note ($60,000 × 0.08 × 3/12 = $1,200).*

2018

Oct. 1 Interest Expense 3,600

Interest Payable 1,200

Cash 4,800

*To record nine months’ interest expense*

*on note ($60,000 × 0.08 × 9/12 = $3,600) and*

*payment of interest for one year.*

Dec. 31 Interest Expense 1,200

Interest Payable 1,200

*To record three months’ interest expense*

*on note.*

2019

Oct. 1 Interest Expense 3,600

Interest Payable 1,200

Notes Payable 60,000

Cash 64,800

*To record nine months’ interest expense*

*and payment of face amount of note at*

*maturity plus interest for one year.*

### E 10–7 (LO2) Accounting for Long-Term Note Payable

2017

July 1 Cash 500,000

Notes Payable 500,000

*Borrowed $500,000 from First National Bank*

*and issued a note.*

Dec. 31 Interest Expense 25,000

Cash 25,000

*To record payment of interest on the note*

*($500,000 × 0.10 × 6/12).*

2018

June 30 Interest Expense 25,000

Cash 25,000

*To record payment of interest on the note*

*($500,000 × 0.10 × 6/12).*

Dec. 31 Interest Expense 25,000

Cash 25,000

*To record payment of interest on the note*

*($500,000 × 0.10 × 6/12).*

2019

June 30 Interest Expense 25,000

Cash 25,000 *To record payment of interest on the note*

*($500,000 × 0.10 × 6/12).*

Dec. 31 Interest Expense 25,000

Cash 25,000

*To record payment of interest on the note*

*($500,000 × 0.10 × 6/12).*

2020

June 30 Interest Expense 25,000

Cash 25,000

*To record payment of interest on the note*

*($500,000 × 0.10 × 6/12).*

30 Notes Payable 500,000

Cash 500,000

*To record payment of note in full.*

### E 10–8 (LO2) Accounting for a Mortgage

1. Monthly Principal Interest Outstanding

Month Payment Paid Paid Balance

$50,000

June $ 525 $ 192 $ 333 49,808

July 525 193 332 49,615

August 525 194 331 49,421

September 525 196 329 49,225

October 525 197 328 49,028

November 525 198 327 48,830

December 525 199 326 48,631

Totals $3,675 $1,369 $2,306

Note: For simplicity in calculation, the monthly payment in this example is set at $525. In actuality, with a loan amount of $50,000, with 144 payments (12 years × 12 months), and an interest rate of 8% compounded monthly, the actual payment would be $541.

2. Interest of $2,306 will be paid during the last seven months of 2017.

3. By the end of 2017, the balance of the mortgage will have been reduced by $1,369.

### E 10–9 (LO2) Accounting for a Mortgage

1. Using (Table II, Appendix D) the present value of an annuity factor for 60 payments at an interest rate of 1% is 44.9550. Dividing this factor into $250,000 results in a monthly payment of $5,561 (rounded).

2. Monthly Principal Interest Outstanding

Month Payment Paid Paid Balance

$250,000

January $ 5,561 $ 3,061 $ 2,500 246,939

February 5,561 3,092 2,469 243,847

March 5,561 3,123 2,438 240,724

April 5,561 3,154 2,407 237,570

May 5,561 3,185 2,376 234,385

June 5,561 3,217 2,344 231,168

July 5,561 3,249 2,312 227,919

August 5,561 3,282 2,279 224,637

September 5,561 3,315 2,246 221,322

October 5,561 3,348 2,213 217,974

November 5,561 3,381 2,180 214,593

December 5,561 3,415 2,146 211,178

Totals $66,732 $38,822 $27,910

E 10–9 (LO2) (Continued)

3. 2017

Jan. 31 Mortgage Payable 3,061

Interest Expense 2,500

Cash 5,561

*To record payment of first mortgage payment.*

4. For each subsequent journal entry, the accounts will be the same; only the amounts will differ. The table prepared in part (2) provides the amount of interest and principal for each successive payment.

### E 10-10 (LO2) Accounting for Interest-Bearing Notes.

2017

July 1

Cash 50,000

Notes Payable 50,000

Nov. 1

Cash 42,000

Notes Payable 42,000

Dec. 31

Interest Expense

  ($50,000 X 8% X 6/12) 2,000

Interest Payable 2,000

Interest Expense

  ($42,000 X 7% X 2/12) 490

Interest Payable 490

2018

Feb. 1

Notes Payable 42,000

Interest Payable 490

Interest Expense 245

Cash 42,735

Apr. 1

Notes Payable 50,000

Interest Payable 2,000

Interest Expense 1,000

Cash 53,000

### E 10–11 (LO3) Issuance Price of Bonds

The issuance price is determined as follows:

Maturity value of the bonds $ 160,000

PV discounted at 4% for 12 periods (Table I, Appendix D) × 0.6246

$ 99,936

Interest payments ($160,000 × 0.05) $ 8,000

PV of interest payments discounted at 4% for 12

payments (Table II, Appendix D) × 9.3851

75,081

Total issuance price $175,017

### E 10–12 (LO3) Issuance Price of Bonds

The issuance price is determined as follows:

Maturity value of the bonds $ 100,000

PV discounted at 5% for 14 periods (Table I, Appendix D) × 0.5051

$50,510

Interest payments ($100,000 × 0.035) $ 3,500

PV of interest payments discounted at 5% for 14

payments (Table II, Appendix D) × 9.8986

34,645

Total issuance price $85,155

### E 10–13 (LO3) Accounting for Bonds Issued at Face Value

1. 2017

July 1 Cash 500,000

Bonds Payable 500,000

*To record the issuance of $500,000,*

*five-year, 10% bonds at face value.*

2. 2017

Dec. 31 Bond Interest Expense 25,000

Cash 25,000

*To record bond interest expense ($500,000*

*× 0.10 × 6/12 = $25,000) for six months.*

3. 2018

Sept. 30 Bond Interest Expense 12,500

Cash 12,500

*To pay bond interest expense from July 1 to*

*date of retirement ($500,000 × 0.10 × 3/12 =*

*$12,500).*

Bonds Payable 500,000

Cash 486,000

Gain on Bond Retirement 14,000

*To retire bonds early when market price was*

*$486,000.*

4. Romulus could retire the bonds with a book value of $500,000 for only $486,000. Thus, the company was able to take a liability off its books at less than the face amount.

### E 10–14 (LO3) Accounting for Bonds Issued at Face Value

1. 2017

Sept. 1 Cash 280,000

Bonds Payable 280,000

*Issued $280,000, 9%, 10-year bonds at*

*face value.*

2. 2017

Dec. 31 Bond Interest Expense 8,400

Bond Interest Payable 8,400

*To recognize bond interest expense*

*($280,000 × 0.09 × 4/12 = $8,400).*

E 10–14 (LO3) (Continued)

3. 2018

Mar. 1 Bond Interest Expense 4,200

Bond Interest Payable 8,400

Cash 12,600

*To recognize bond interest expense and*

*eliminate interest payable. Cash paid for*

*interest is $12,600 ($280,000 × 0.09 × 6/12).*

Sept. 1 Bond Interest Expense 12,600

Cash 12,600

*To recognize bond interest expense*

*($280,000 × 0.09 × 6/12 = $12,600).*

Dec. 31 Bond Interest Expense 8,400

Bond Interest Payable 8,400

*To recognize bond interest expense*

*($280,000 × 0.09 × 4/12 = $8,400).*

4. 2019

Feb. 20 Bond Interest Payable 8,400

Bond Interest Expense 3,500

Cash 11,900

*To pay bond interest from Sept. 1 to*

*Feb. 20 (date of retirement). Bond interest*

*expense from Jan. 1 is ($280,000 × 0.09 ×*

*5/3 months x 1/12 = $3,500).*

Bonds Payable 280,000

Loss on Bond Retirement 20,000

Cash 300,000

*To retire bonds early paying $300,000 and*

*record loss on retirement of $20,000.*

5. Elric Alphonse must have had excess cash and was willing to pay slightly more than the book value of the debt in order to retire the debt earlier. By retiring the bonds earlier, Elric Alphonse is able to avoid future interest payments and also is able to remove the debt from its financial statements.

### E 10–15 (LO4) Computation of Debt-Related Financial Ratios

1. Debt ratio: (Total liabilities/Total assets) = $90,000/$150,000 = 60%

2. Debt-to-equity: (Total liabilities/Total equity) = $90,000/$60,000 =1.5

3. Times interest earned: (Operating income/Interest expense) =

$25,000/$18,000 = 1.39 times

E 10-16 (LO4) Discussing the Impact of Unrecorded Obligations on Liquidity and Solvency

1. (1). Working capital = NT$3,500 – NT$3,000 = NT$500

(2). Current ratio = NT$3,500 ÷ NT$3,000 = 1.1667:1

(3). Debt to assets ratio = NT$16,000 ÷ NT$30,000 = 53.33%

(4). Times interest earned = (NT$4,500 + NT$1,950 + NT$475) ÷ NT$475 = 14.58 times

A current ratio that is less than 1.30 indicates lower liquidity. The debt to assets ratio indicates that NT$.53 of each dollar of assets have been financed by creditors. The times interest earned of over 14 times indicates that Swarlie Ltd. income is large enough to make required interest payments as they come due.

2. Debt to assets ratio, adjusted for off-balance-sheet lease obligations.



By including these off-balance-sheet obligations the debt to assets ratio increases from 53% to 63%, suggesting that Swarlie Ltd. is not as solvent as it first appears.

## PROBLEMS

P 10–1 (LO1) Present and Future Value Computations

1. a. Principal:

$15,000× 0.6730 (Table I) = $ 10,095 (20 periods, 2%)

Interest payments:

$15,000 × 0.08 × 1/4 = $300

$300 × 16.3514 (Table II) = 4,905 (20 payments, 2%)

$ 15,000

b. Principal:

$12,000 × 0.4970 (Table I) = $ 5,964 (12 periods, 6%)

Interest payments:

$12,000 × 0.12 × 1/2 = $720

$720 × 8.3838 (Table II) = 6,036 (12 payments, 6%)

$12,000

c. $7,000 × 11.2551 (Table II) = $78,786 (12 payments, 1%)

2. a. $20,000 × 1.3686 (Table III) = $27,372 (8 periods, 4%)

b. $60,000 × 5.8916 (Table III) = $353,496 (60 periods, 3%)

### P 10–2 (LO1) Present and Future Value Computations

1. a. $30,000 × 0.6209 (Table I) = $18,627 (5 periods, 10%)

b. $6,000 × 3.7908 (Table II) = $22,745 (5 payments, 10%)

c. Principal: $25,000 × 0.6209 (Table I) = $15,523 (5 periods, 10%)

Interest: $2,500 × 3.7908 (Table II) = 9,477 (5 payments, 10%)

Total present value $25,000

2. a. $20,000 × 1.6105 (Table III) = $32,210 (5 periods, 10%)

b. $8,000 × 3.2810 (Table III) = $26,248 (60 periods, 2%)

### P 10–3 (LO1) Computing the Amount of Periodic Payments

1. PVANN = Payment [PVANN Factor (Table II): n = ?, i = ?]

$20,000 = Payment [PVANN Factor (Table II): n = 30, i = 1%]

$20,000 = Payment [25.8077]

Payment = $20,000/25.8077

Payment = $774.96

2. PVANN = Payment [PVANN Factor (Table II): n = ?, i = ?]

$20,000 = Payment [PVANN Factor (Table II): n = 60, i = 1%]

$20,000 = Payment [44.9550]

Payment = $20,000/44.9550

Payment = $444.89

3. PVANN = Payment [PVANN Factor (Table II): n = ?, i = ?]

PVANN = $444.89 [PVANN Factor (Table II): n = 30, i = 1%]

PVANN = $444.89 [25.8077]

PVANN = $444.89 × 25.8077

PVANN = $11,481.59

After making the 30th payment, the balance on the loan is $11,481.59. Note that even though half the payments have been made, more than half the loan balance remains. This is because the initial payments include lots of interest and not as much principal. As the balance of the loan amount is reduced, each succeeding payment includes less interest and more principal.

### P 10–4 (LO2) Accounting for Notes Payable

2017

Jan. 1 Cash 8,000

Note Payable 8,000

*Borrowed $8,000 from Peterson Bank, issuing*

*a 2-year, 10% note.*

1 Cash 4,500

Note Payable 4,500

*Borrowed $4,500 from Laurence National Bank,*

*issuing a 3-year, 11% note.*

Dec. 31 Interest Expense 1,295

Interest Payable 1,295

*To recognize interest expense on 2-year note of*

*$800 ($8,000 × 0.10) and on 3-year note of $495*

*($4,500 × 0.11).*

P 10–4 (LO2) (Continued)

2018

Jan. 1 Interest Payable 1,295

Cash 1,295

*To record payment of interest on notes payable.*

Dec. 31 Interest Expense 1,295

Interest Payable 1,295

*To recognize interest expense on 2-year note of*

*$800 ($8,000 × 0.10) and on 3-year note of $495*

*($4,500 × 0.11).*

2019

Jan. 1 Interest Payable 1,295

Cash 1,295

*To record payment of interest on notes payable.*

1 Note Payable 8,000

Cash 8,000

*To record payment of 2-year note from Peterson*

*Bank.*

Dec. 31 Interest Expense 495

Interest Payable 495

*To recognize interest expense on 3-year note of*

*$495 ($4,500 × 0.11).*

2020

Jan. 1 Interest Payable 495

Cash 495

*To record payment of interest on note payable.*

1 Note Payable 4,500

Cash 4,500

*To record payment of 3-year note from Laurence*

*National Bank.*

### P 10–5 (LO2) Accounting for Notes Payable

1. 2017

May 1 Machine 600,000

Note Payable 600,000

*Purchased a machine by issuing a 3-year,*

*7% note.*

July 1 Cash 25,000

Note Payable 25,000

*Issued a 2-year, 6% note to South-Central*

*National Bank.*

2. 2017

Dec. 31 Interest Expense 750

Cash 750

*To record payment of interest on South-Central*

*National Bank note ($25,000 × 0.06 × 6/12).*

31 Interest Expense 28,000

Interest Payable 28,000

*To record interest on Kuma Corporation*

*note payable ($600,000 × 0.07 × 8/12).*

3. 2018

May 1 Interest Expense 14,000

Interest Payable 28,000

Cash 42,000

*To record annual interest payment of $42,000*

*($600,000 × 0.07) and to record interest ex-*

*pense for the first three months of the year.*

June 30 Interest Expense 750

Cash 750

*To record payment of interest on South-Central*

*National Bank note ($25,000 × 0.06 × 6/12).*

Dec. 31 Interest Expense 750

Cash 750

*To record payment of interest on South-Central*

*National Bank note ($25,000 × 0.06 × 6/12).*

31 Interest Expense 28,000

Interest Payable 28,000

*To record interest on Corporation*

*note payable ($600,000 × 0.07 × 8/12).*

P 10–6 (LO2) Accounting for a Mortgage

1. 2018

Nov. 1 Land 75,000

Building 325,000

Mortgage Payable 400,000

*Purchased land and building on a 30-year,*

*12% mortgage.*

2. 2018

Nov. 30 Interest Expense 4,000

Mortgage Payable 114

Cash 4,114

*Made monthly mortgage payment*

*($400,000 × 0.01 = $4,000 interest).*

Dec. 31 Interest Expense 3,999

Mortgage Payable 115

Cash 4,114

*Made monthly payment ($400,000 – $114 =*

*$399,886; $399,886 × 0.01 = $3,999).*

3. The total mortgage balance of $399,771 ($400,000 – $114 – $115 = $399,771) would be reported in the liabilities section of the December 31, 2017, balance sheet. The amount of principal that will be paid during 2018 would be reported as a current liability (current portion of long-term debt); the remaining balance as a long-term liability.

### P 10–7 (LO3) Issuance Price of Bonds

*June 30 Bonds*

Maturity value of the bonds $ 750,000

PV discounted @ 2% for 60 periods (Table I) × 0.3048

$ 228,600

Interest payments ($750,000 × 0.03) $ 22,500

PV discounted @ 2% for 60 payments (Table II) × 34.7609

782,120

Issuance price of bonds $1,010,720

*August 31 Bonds*

Maturity value of the bonds $ 556,000

PV discounted @ 4% for 40 periods (Table I) × 0.2083

$ 115,815

P 10–7 (LO3) (Continued)

Interest payments ($556,000 × 0.025) $ 13,900

PV discounted @ 4% for 40 payments (Table II) × 19.7928

275,120

Issuance price of bonds $ 390,935

### P 10–8 (LO3) Accounting for Bonds

1. Present value of an annuity of $20,000 for

60 payments at 4% interest ($20,000 × 22.6235) (Table II) $452,470

Present value of a single payment of $500,000 for

60 periods at 4% interest ($500,000 × 0.0951) (Table I) 47,550

Present value of bond $500,000\*

\*Rounded

2. 2017

July 1 Cash 500,000

Bonds Payable 500,000

*To record issuance of $500,000, 30-year,*

*8% bonds at face value.*

3. 2017

Dec. 31 Bond Interest Expense 20,000

Bond Interest Payable 20,000

*To record bond interest expense ($500,000*

*× 0.08 × 6/12).*

4. 2020

Oct. 1 Bond Interest Expense 10,000

Cash 10,000

*Paid interest for three months, July 1–Oct. 1*

*($500,000 × 0.08 × 3/12 = $10,000).*

Bonds Payable 500,000

Cash 495,000

Gain on Bond Retirement 5,000

*To retire bonds with a carrying amount of*

*$500,000 by paying $495,000.*

### P 10–9 (LO3) Accounting for Bonds

1. 2017

Nov. 1 Cash 1,500,000

Bonds Payable 1,500,000

*To record issuance of $1,500,000, 20-year,*

*9% bonds at face value.*

2. 2017

Dec. 31 Bond Interest Expense 22,500

Bond Interest Payable 22,500

*To record bond interest expense ($1,500,000*

*× 0.09 × 2/12).*

3. 2018

May 1 Bond Interest Expense 45,000

Bond Interest Payable 22,500

Cash 67,500

*To record semiannual interest payment of*

*$67,500 ($1,500,000 × 0.09 × 6/12) and to*

*record bond interest expense for the first*

*four months of the year.*

Nov. 1 Bond Interest Expense 67,500

Cash 67,500

*To record semiannual bond interest payment.*

Dec. 31 Bond Interest Expense 22,500

Bond Interest Payable 22,500

*To record bond interest expense*

*($1,500,000 × 0.09 × 2/12).*

**P 10-10 (LO4) Accounting for Bond Interest Payments, Premium Amortization, and Redemption.**

*1. 2018*

*Jan.  1 Interest Payable   280,000\*\**

*Cash  280,000*

*2. Dec. 31 Interest Expense   304,000\*\**

*Bonds Payable ($240,000 ÷ 10) 24,000*

*Interest Payable 280,000*

*3. 2019*

*Jan 1 Bonds Payable 1,200,000\*\**

*Bonds Payable    64,800\*\**

*Gain on Bond Redemption*

*($1,272,000 – $1,212,000) 52,800*

*Cash ($1,200,000 X 101%) 1,212,000*

*\*($240,000 – $24,000) X 0.30 = $64,800*

*4. Dec. 31 Interest Expense   212,800\*\**

*Bonds Payable     16,800\*\**

*Interest Payable*

*($2,800,000 X 7%) 196,000*

*\*\*$240,000 – $24,000 – $64,800 = $151,200 $151,200/ 9 = $16,800 or $24,000 X 0.70.*

### P 10–11 (LO4) Reporting Liabilities on the Balance Sheet

Liabilities

Current liabilities:

Accounts payable $48,000

Notes payable 24,000

Income taxes payable 18,000

Unearned sales revenue 32,000

Mortgage payable (current portion) 12,300

Property taxes payable 8,700

Salaries and wages payable 15,200

Sales tax payable 2,500

Total current liabilities $160,700

Long-term liabilities:

Notes payable $40,000

Mortgage payable 93,000

Total long-term liabilities 133,000

Total liabilities $293,700

### P 10–12 (LO4) Computation of Debt-Related Financial Ratios

1. Debt ratio: (Total liabilities/Total assets) = $540,000/$1,020,000 = 52.9%

2. Debt-to-equity: (Total liabilities/Total equity) = $540,000/$480,000 = 1.125

3. Times interest earned: (Earnings before interest and taxes/Interest) $128,000/$78,000 = 1.64 times

Earnings before interest and taxes is computed as earnings before income taxes plus interest expense.

4. Of the three ratios presented, the times interest earned ratio is probably the single most useful value in this case. This ratio shows that Walker Company is currently generating just enough operating profit to be able to pay existing interest expense, with a small cushion. This low ratio value means that there is a real chance that operating profit in future years might not be enough to cover interest expense. The other ratio values in this case can really be interpreted meaningfully only by seeing values for similar companies in the same industry.

## ANALYTICAL ASSIGNMENTS

AA 10–1 *You Decide:* If a young company has a negative “times interest earned” ratio, should the company be refused or given a loan by lenders?

Judgment Call

Issues to be discussed with this question are:

**1.** Whether or not the company will have (or really is near to having) a product that will generate significant revenue.

**2.** It could be that with this last $100,000, the company will be highly profitable. On the other hand, the financial institution must decide if by making the loan it would be throwing good money after bad money.

**3.** The loans that have already been made and the money that has already been spent should be considered sunk costs (a topic for discussion in the managerial portion of this book), and the decision of whether or not to make the loan should be based on whether there will be revenues to repay the loan given the other obligations the company has as well.

**4.** Certainly, you would want additional information (such as possible collateral, etc.) before you made the final decision.

AA 10–2 Carrefour

Real Company Analysis

**1.** Carrefour’s long-term debt decreased by €153 million (€6,662 –€6,815), and its total assets actually decreased by €694 million (€45,095 – €45,789). However, the main reason for this decrease in total assets is clearly a decrease in non-current liabilities, which are €2,549 million lower than at the end of the previous year (€12,106 – €12,508).

**2.** Debt ratio:

2014: (€12,508+€23,053)/ €45,789=77.7%

2015: (€12,106+€22,317)/ €45,095=76.3%

Carrefour’s debt ratio (Total liabilities/Total assets) decreased from 77.7% in 2014 to 76.3% in 2015. The primary reason for the decrease was the decrease in long-term borrowings.

AA 10–3 IBM

Real Company Analysis

**1.** A debenture is an unsecured bond. Recall that a bond is a piece of paper issued by a company (such as IBM) in which the company promises to pay a certain maturity amount (usually $1,000) at a specified date in the future, plus interest every year between now and then. In exchange for this promise to pay, IBM receives financing from investors who buy the bonds. So, a bond is simply a way for IBM to borrow money. The fact that a debenture is an unsecured bond means that the only assurance that investors have that IBM will pay the money promised in the bond contract is IBM’s good word. There is no specific collateral attached to the debentures.

**2.** IBM’s 7.13% debentures are unusual because they do not mature until the year 2096. It looks as if these bonds had an initial maturity period of 100 years—very long-term bonds indeed.

**3.** IBM gets some of its loans denominated in foreign currencies for a variety of reasons. First, some countries are reluctant to allow large multinational corporations such as IBM to do business in their countries without using local financing. Using local financial institutions as much as possible helps IBM establish good local relations. Also, some of IBM’s foreign subsidiaries are relatively self-contained, meaning that almost all operating, investing, and financing activities are handled locally. Sometimes IBM gets foreign currency financing because the interest rate is low. (Look at the 0.6% average rate on the Japanese yen loans.)

Finally, foreign currency financing is a way for IBM to hedge, or protect itself, against fluctuations in the value of foreign currencies. For example, if IBM has assets denominated in Thai baht, and the baht decreases in value, then IBM will have lost money. However, if IBM has an equal amount of loans denominated in Thai baht, the loss from the decrease in the value of the Thai baht assets will be offset by the gain from the decrease in value of the Thai baht liabilities. This is called a hedge and results in IBM being immune from the effects of exchange rate changes, up or down.

**4.** Two key reasons for the large difference in interest rates on loans denominated in different currencies are the expected stability of the currencies and the expected inflation rates in the home countries. If you were to get a loan in Indonesian rupiah, you would have to pay a much higher rate because the lender runs the risk that the rupiah will become worthless between now and the time you repay the loan. In addition, expected inflation rates affect the interest rates on loans. Because the lender wants the interest received to reimburse him or her for the lost purchasing power caused by inflation, higher expected inflation means higher interest rates. The primary reason that interest rates in the United States were much lower in the 1990s than in the early 1980s is that expected inflation was lower.

EXPANDED MATERIAL

## DISCUSSION QUESTIONS

**15.** Discount on Bonds Payable is a contra-liability account that is deducted from Bonds Payable on the balance sheet.

**16.** The discount on bonds payable account is a contra-liability account that is offset against the bonds payable account to arrive at the book value of the bonds payable. The discount (with its debit balance) serves to reduce the book value of the bonds (with their credit balance). As the discount is reduced, the amount offset against the bonds becomes smaller, thereby increasing the book value of the bonds.

**17.** The effective-interest amortization method is more theoretically appropriate than the straight-line method because it takes into consideration the time value of money. The effective-interest amortization amount is equal to the effective interest rate times the amount of money actually borrowed at any point in time. The straight-line method provides only an approximation of true interest. Also, with effective-interest amortization, the bond balance is always equal to the present value of the future bond payments.

**18.** The carrying amount of a bond is the face amount of the bond plus any premium or less any discount. The discount or premium is amortized over the life of the bond, resulting in the book value and the face amount eventually being equal on the day the bond matures.

**19.** Under the effective-interest method, the carrying amount of the bond influences the amount of bond interest expense for a period. The amount of interest each period in turn affects the carrying amount for the next period. To compute bond interest expense using the effective-interest method, the carrying amount of the bond is multiplied by the effective rate of interest. The difference between the amount of cash paid and the bond interest expense serves to reduce the discount or premium account. Thus, the carrying amount for the next period is changed by the amount of the premium or discount amortized in the current period.

**20.** When the effective interest rate on bonds is higher than the stated rate, the bonds will sell at a discount because investors are asking for a higher return on their investment than what they will receive in cash payments. Therefore, the bond interest expense for each period will be higher than the cash paid since the bond interest expense for the period will be equal to the cash paid plus the bond discount amortization. A sample journal entry showing the relative amount of bond interest expense in relation to cash paid is:

Bond Interest Expense 2,304

Cash 2,000

Discount on Bonds Payable 304

## EXERCISES

### E 10–17 (LO3, LO5) Accounting for Bonds Issued at a Discount

2017

June 30 Cash 490,000

Discount on Bonds Payable 10,000

Bonds Payable 500,000

*Issued $500,000, 10%, five-year bonds at 98.*

Dec. 31 Bond Interest Expense 26,000

Discount on Bonds Payable 1,000

Cash 25,000

*Paid semiannual interest on the bonds*

*($500,000 × 0.10 × 1/2 year = $25,000).*

*Amortization: $10,000/60 months $166.67*

*per month × 6 months = $1,000.*

2018

Jan. 31 Bond Interest Expense 4,333

Discount on Bonds Payable 167

Bond Interest Payable 4,166

*To recognize bond interest expense for*

*one month ($500,000 × 0.10 × 1/12 year =*

*$4,166) and amortize bond discount for*

*one month at $166.*

2018

June 30 Bond Interest Payable 4,166

Bond Interest Expense 21,667

Discount on Bonds Payable 833

Cash 25,000

*Paid semiannual interest on bonds; discount*

*amortization = $166.67 × 5 months = $833.*

2022

June 30 Bonds Payable 500,000

Cash 500,000

*To retire $500,000, 10%, five-year bonds at*

*maturity.*

### E 10–18 (LO3, LO5) Accounting for Bonds Issued at a Premium

1. Journal entries

a. 2018

Apr. 1 Cash 102,000

Premium on Bonds Payable 2,000

Bonds Payable 100,000

*Issued $100,000 face value of 10%,*

*10-year bonds at a price of 102*

*($100,000 × 1.02 = $102,000).*

b. 2018

Oct. 1 Bond Interest Expense 4,900

Premium on Bonds Payable 100

Cash 5,000

*To record semiannual payment at*

*5% on $100,000 face value bonds*

*and amortize 1/20 of a $2,000 premium.*

c. 2018

Dec. 31 Bond Interest Expense 2,450

Premium on Bonds Payable 50

Bond Interest Payable 2,500

*To record bond interest for three*

*months and amortize bond premium*

*($100/2 = $50).*

2. Balance sheet presentation at December 31, 2018

Bonds payable $100,000

Plus: Premium on bonds payable 1,850 $101,850

There would also be a bond interest payable at $2,500 on the balance sheet.

### E 10–19 (LO5) Effective-Interest Calculation

The discount equals $13,500, which will be amortized at $13,500/3 years = $4,500 a year. Total annual interest expense = $4,500 + ($675,000 × 0.09) = $65,250. The effective interest rate is equal to annual interest expense ÷ amount of cash received at issuance ($65,250/$661,500), or approximately 9.86%.

### E 10–20 (LO5) Bond Amortization Schedule

(1) $373\* + $2,627 = $3,000

(2) $52,537 – $52,164 = $373

(3) $3,000 – $392 = $2,608

(4) $52,164 – $392 = $51,772

(5) $3,000 (same as other periods or $50,000 × 0.06)

(6) $51,772 × (10% × 1/2 year)\*\* = $2,589

(7) $3,000 – $2,589 = $411

(8) $51,772 – $411 = $51,361

\*From item (2)

\*\*Interest expense ÷ Carrying value = 0.05, or 1/2 of 0.10

### E 10–21 (LO3, LO5) Accounting for Bonds

1. 2017

May 1 Cash 679,000

Discount on Bonds Payable 21,000

Bonds Payable 700,000

*Issued 15-year, 11% bonds at 97 ($700,000*

*× 0.97 = $679,000).*

2. 2017

Nov. 1 Bond Interest Expense 39,200

Discount on Bonds Payable 700

Cash 38,500

*Paid semiannual interest on 15-year, 11%*

*bonds ($700,000 × 0.11 × 1/2 = $38,500)*

*and amortized bond discount for six months*

*($21,000/180 months = $116.67 per month;*

*$116.67 × 6 = $700, rounded to the nearest*

*dollar).*

3. 2017

Dec. 31 Bond Interest Expense 13,067

Discount on Bonds Payable 233

Bond Interest Payable 12,834

*To record two months’ bond interest*

*($38,500× 2/6 = $12,833) and bond discount*

*amortization for two months ($116.67 × 2 =*

*$233, rounded to the nearest dollar).*

E 10–21 (LO4, LO5) (Continued)

4. 2018

May 1 Bond Interest Expense 26,133

Bond Interest Payable 12,834

Discount on Bonds 467

Cash 38,500

*Paid semiannual interest on 15-year, 11%*

*bonds and amortized bond discount for*

*four months ($116.67 × 4 = $467, rounded to*

*the nearest dollar).*

## PROBLEMS

### P 10–13 (LO3, LO5) Accounting for Bonds

1. a. Cash 87,300

Discount on Bonds Payable 2,700

Bonds Payable  90,000

*Issued $90,000 of bonds at 97.*

b. Cash 90,000

Bonds Payable 90,000

Issued $90,000 of bonds at face value.

c. Cash 94,500

Premium on Bonds Payable 4,500

Bonds Payable 90,000

*Issued $90,000 of bonds at 105.*

2. a. Bond Interest Expense 6,885

Discount on Bonds Payable 135

Bond Interest Payable 6,750

*To recognize bond interest expense (discount*

*amortization = $2,700/180 months = $15/month;*

*$15 × 9 months = $135; interest = $90,000 ×*

*0.10 × 3/4 year = $6,750).*

b. Bond Interest Expense 6,750

Bond Interest Payable 6,750

*To recognize bond interest expense ($90,000*

*× 0.10 × 3/4 year = $6,750).*

c. Bond Interest Expense 6,525

Premium on Bonds Payable 225

Bond Interest Payable 6,750

*To recognize bond interest expense (premium*

*amortization = $4,500/180 months = $25 per month;*

*$25 × 9 months = $225; interest = $90,000 ×*

*0.10 × 3/4 year = $6,750).*

3. Presentation of bond liabilities on the December 31, 2018, balance sheet

a. When bonds were sold at 97 b. When bonds were sold at face value

Current liabilities: Current liabilities:

Bond interest payable $ 6,750 Bond interest payable $ 6,750

Long-term liabilities: Long-term liabilities:

Bonds payable $90,000 Bonds payable $90,000

Less: Discount on

bonds payable (2,565)

Bond carrying amount $87,435

c. When bonds were sold at 105

Current liabilities:

Bond interest payable $ 6,750

Long-term liabilities:

Bonds payable $90,000

Plus: Premium on

bonds payable 4,275

Bond carrying amount $94,275

4. Bonds will sell at 97, which is less than face value, when investors are asking for a higher rate of interest on their investment than the 10% rate stated in the bond contract. Bonds will sell at 105, which is at a higher price than face value, when investors are willing to accept a lower rate of return on their investment than the 10% rate stated in the bond contract.

### P 10–14 (LO3, LO5) Accounting for Bonds Issued at a Premium

1. 2017

Mar. 1 Cash 189,000

Bonds Payable 180,000

Premium on Bonds Payable 9,000

*Issued $180,000, 12%, 5-year bonds at 105.*

2. 2017

Sept. 1 Bond Interest Expense 9,900

Premium on Bonds Payable 900

Cash 10,800

*Paid semiannual interest on bonds (premium*

*amortization = $9,000/60 months = $150; $150*

*× 6 months = $900). Cash paid = $180,000 × 12%*

*× 1/2 = $10,800.*

P 10–14 (LO3, LO5) (Continued)

3. 2017

Dec. 31 Bond Interest Expense 6,600

Premium on Bonds Payable 600

Bond Interest Payable 7,200

*To recognize bond interest expense and*

*premium amortization for four months*

*($150 × 4 months = $600). Bond interest*

*payable = $180,000 × 12% × 4/12 = $7,200.*

4. 2022

Mar. 1 Bond Interest Payable 7,200

Bond Interest Expense 3,300

Premium on Bonds 300

Cash 10,800

*Paid final semiannual interest payment and*

*recorded premium amortization for two*

*months at $150 per month.*

Bonds Payable 180,000

Cash 180,000

*Retired $180,000 of 12%, 5-year bonds at maturity.*

### P 10–15 (LO3, LO5) Straight-Line versus Effective-Interest Amortization

1. $ 150,000 × 0.5584 (Table I—6%, 10 periods) $ 83,760

$7,500 × 7.3601 (Table II—6%, 10 payments) 55,201

Issuance price of bonds $138,961

2. Cash Bond

Interest Interest Discount Carrying

Date Payment Expense Amortization Value

January 1, 2017 $138,961

July 1, 2017 $ 7,500 $ 8,338 $ 838 139,799

January 1, 2018 7,500 8,388 888 140,687

July 1, 2018 7,500 8,441 941 141,628

January 1, 2019 7,500 8,498 998 142,626

July 1, 2019 7,500 8,558 1,058 143,684

January 1, 2020 7,500 8,621 1,121 144,805

July 1, 2020 7,500 8,688 1,188 145,993

January 1, 2021 7,500 8,760 1,260 147,253

July 1, 2021 7,500 8,835 1,335 148,588

January 1, 2022 7,500 8,912\*\* 1,412\*\* 150,000

Totals $75,000 $86,039 $11,039

\*\*Rounded

3. Interest Expense

Year Straight-Line Effective-Interest

2017 $17,208 $16,726

2018 17,208 16,939

2019 17,208 17,179

2020 17,208 17,448

2021 17,207\*\* 17,747

Totals $86,039 $86,039

\*\*Rounded

P 10–15 (LO3, LO5) (Continued)

4. 2021

a. Dec. 31 Interest Expense 8,912

Discount on Bonds Payable 1,412

Bond Interest Payable 7,500

*Accrued final interest obligation at maturity*

*of bonds.*

2022

b. Jan. 1 Bond Interest Payable 7,500

Cash 7,500

*Paid final interest payment at maturity of*

*bonds.*

5. 2022

Jan. 1 Bonds Payable 150,000

Cash 150,000

*Retired 10%, 5-year bonds.*

6. If the difference between the two methods has a material effect on income in any year, then the effective-interest method is required. In this case, since the difference does not exceed $540 in any one year, it is not likely to have a significant impact on net income. Either method would probably be acceptable. In practice, the auditing firm that expresses an opinion on the financial statements must make a judgment as to whether the difference has a material effect on net income. The difference would be considered material if its effect on net income would alter the decision of a prudent reader of the financial statements after considering the numbers influenced by the method used. There are no hard-and-fast rules or guidelines for what constitutes materiality in any given situation.

### P 10–16 (LO3, LO5) Effective-Interest Amortization

1. $350,000×0.7462(Table I—5%, 6 periods) $261,170

$21,000 × 5.0757 (Table II—5%, 6 payments) 106,590

Present value (price of bonds) $367,760

2. Cash Bond

Interest Interest Premium Carrying

Period Payment Expense Amortization Value

January 1, 2017 $367,760

July 1, 2017 $ 21,000 $ 18,388 $ 2,612 365,148

January 1, 2018 21,000 18,257 2,743 362,405

July 1, 2018 21,000 18,120 2,880 359,525

January 1, 2019 21,000 17,976 3,024 356,501

July 1, 2019 21,000 17,825 3,175 353,326

January 1, 2020 21,000 17,674\*\* 3,326\*\* 350,000\*\*

Totals $126,000 $108,240 $17,760

|  |  |  |
| --- | --- | --- |
|  |  | |
|  |  |  |

$126,000

\*\*Rounded

3. 2019

July 1 Bond Interest Expense 17,825

Premium on Bonds Payable 3,175

Cash 21,000

*Paid semiannual interest and amortized the*

*bond premium for six months.*

4. The bonds were sold for more than face value because the company promised to pay a higher rate of interest (12%) than the investors were expecting (10%) at the time the bonds were issued.

### P 10–17 (LO3, LO5) Straight-Line versus Effective-Interest Amortization

1. $180,000 × 0.7050 (Table I—6%, 6 periods) $126,900

$9,000 × 4.9173 (Table II—6%, 6 payments) 44,256

Issuance price of bonds $171,156

2. Amortization Schedule

Bond

Interest Interest Discount Carrying

Date Payment Expense Amortization Value

March 1, 2017 $171,156

September 1, 2017 $ 9,000 $10,269 $1,269 172,425

March 1, 2018 9,000 10,346 1,346 173,771

September 1, 2018 9,000 10,426 1,426 175,197

March 1, 2019 9,000 10,512 1,512 176,709

September 1, 2019 9,000 10,603 1,603 178,312

March 1, 2020 9,000 10,688\*\* 1,688\*\* 180,000\*\*

Totals $54,000 $62,844 $8,844

\*\*Rounded

3. Year Effective-Interest Straight-Line

2017–2018 $20,615 $20,948

2018–2019 20,938 20,948

2019–2020 21,291 20,948

Totals $62,844 $62,844

4. 2017

Sept. 1 Bond Interest Expense 10,269

Discount on Bonds Payable 1,269

Cash 9,000

*Paid interest on 10%, 3-year bonds and*

*amortized the bond discount using the*

*effective-interest method ($171,156 × 0.06*

*= $10,269; $10,269– $9,000 = $1,269).*

5. 2018

Feb. 28 Bond Interest Expense 10,346

Discount on Bonds Payable 1,346

Bond Interest Payable 9,000

*To accrue interest on 10%, 3-year bonds for*

*six months and amortize the bond discount*

*by an effective-interest method ($172,425 ×*

*0.06 = $10,346 ; $10,346 – $9,000 = $1,346).*

6. 2020

Mar. 1 Bonds Payable 180,000

Cash 180,000

*Retired 10%, 3-year bonds at maturity. (This*

*entry assumes interest has been paid to March 1.)*

### P 10–18 (LO3, LO5) Unifying Concepts: Accounting for Bonds Payable

1. $100,000 × 0.7307 (Table I—4%, 8 periods) $73,070

$3,500 × 6.7327 (Table II—4%, 8 payments) 23,564

Issuance price of bonds $96,634

2. Cash Bond

Interest Interest Discount Carrying

Date Payment Expense Amortization Value

May 1, 2017 $ 96,634

November 1, 2017 $ 3,500 $ 3,865 $ 365 96,999

May 1, 2018 3,500 3,880 380 97,379

November 1, 2018 3,500 3,895 395 97,774

May 1, 2019 3,500 3,911 411 98,185

November 1, 2019 3,500 3,927 427 98,612

May 1, 2020 3,500 3,944 444 99,056

November 1, 2020 3,500 3,962 462 99,518

May 1, 2021 3,500 3,982\*\* 482\*\* 100,000\*\*

Totals $28,000 $31,366 $3,366

\*\*Rounded

3. a. 2017

Dec. 31 Bond Interest Expense 1,294

Discount on Bonds Payable 127

Bond Interest Payable 1,167

*To record bond interest for two months*

*($3,500 × 2/6 = $1,167) and amortize bond*

*discount for two months ($380 × 2/6 = $127).*

b. 2018

May 1 Bond Interest Expense 2,586

Bond Interest Payable 1,167

Discount on Bonds Payable ($380 – $127) 253

Cash 3,500

*To pay semiannual bond interest and amortize*

*bond discount for four months.*

c. 2018

Nov. 1 Bond Interest Expense 3,895

Discount on Bonds Payable 395

Cash 3,500

*To pay semiannual bond interest and amortize*

*bond discount for six months.*

d. 2018

Dec. 31 Bond Interest Expense 1,304

Discount on Bonds Payable 137

Bond Interest Payable 1,167

*To record bond interest for two months*

*($3,500 × 2/6 = $1,167) and amortize bond*

*discount for two months ($411 × 2/6 = $137).*

4. Interest expense for 2018

Computed May 1, 2018 $2,586

Computed November 1, 2018 3,895

Computed December 31, 2018 1,304

Bond interest expense for 2018 $7,785

5. Carrying value of bonds at December 31, 2018

Carrying value at November 1, 2018 (per amortization schedule) $97,774

Add bond discount amortized November to December 31, 2018 137

Carrying value at December 31, 2018 $97,911

6. The issuance price of a bond is based on the relationship of the effective rate of interest to the stated rate of interest quoted on the bond as well as relative risks. If two companies issued bonds with the same face value and the same stated rate of interest on the same day, the effective rate of interest could be different because investors assess the risk inherent in the bonds of one company to be different from the risk inherent in the other company. This difference in assessment could be related to the quality of management, the financial status of the firm, and/or expectations of differences in performance in the future. These could be related to labor problems, differences in product quality, ability to compete in a global economy, and so on.

P 10-19(LO 3, LO 5) Accounting for Bonds Issued at a Discount

2017

Jan.  1 Cash 4,219,600

Bonds Payable 4,219,600

2. Edward Elric Ltd.

Bond Discount Amortization Table

Effective-Interest Method—Annual Interest Payments

9% Bonds Issued at 10%

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Annual  Interest  Periods |  | (A)  Interest  to Be  Paid |  | (B)  Interest  Expense  to Be  Recorded |  | (C)  Discount  Amor-  tization  (B) – (A) |  |  | (D)  Bond  Carrying  Value |
|  |  |  |  |  |  |  |  |  |  |
| Jan 1,2017  Dec 31,2017  Dec 31,2018 |  | $320,000   320,000 |  | $350,843   353,928 |  | $30,843   33,928 |  |  | $3,508,434   3,539,277   3,573,205 |

3. Dec. 31 Interest Expense

  ($3,508,434 X 10%)   350,843

Bonds Payable    30,843

Interest Payable

  ($4,000,000 X 8%) 320,000

4. 2018

Jan. 1 Interest Payable 320,000

Cash 320,000

5. Dec. 31 Interest Expense

  [$3,539,277 X 10%] 353,928

Bonds Payable 33,928

Interest Payable 320,000

SOLUTIONS TO “STOP & THINK”

***Stop & Think (p. 418):*** Without referencing the present value tables, answer these questions: As interest rates increase, would you expect the present value factors to increase or decrease? Why?

If you can invest at a higher interest rate, you would expect to be able to invest a smaller sum of money now and yet still receive the same amount in the future. Why? Your investment can be smaller because the interest you earn will be larger. As a result, you would expect the present value factors to get smaller as interest rates rise. This can be confirmed by looking at the present value of a single amount table.

***Stop & Think (p. 427):*** If the market rate of interest is higher than the rate of interest stated on the bonds, will the bonds sell at a price higher or lower than the face value? Is the higher rate more attractive to investors, and if it is, what would investors do as a result?

It is important for students to understand the intuition behind the relationship between bond prices and interest rates. This question is answered in the paragraphs that follow this box in the chapter. If an issuer is offering a bond that pays a higher rate of interest than other bonds of the same risk, investors will bid the price of the bond up.