

Chapter 9

Long-Term Liabilities

REVIEW QUESTIONS

Question 9-1 (LO 9-1)

Capital structure is the mixture of liabilities and stockholders' equity a business uses. Companies in the auto industry, like Ford, typically lean more toward liabilities for their financing, while companies in the computer industry, like Microsoft, use stockholders' equity to a greater extent in financing their asset growth.

Question 9-2 (LO 9-1)

One of the primary reasons a company chooses to borrow money rather than issue additional stock relates to taxes. Interest expense incurred when borrowing money is tax deductible, while dividends paid to stockholders is *not* tax deductible. Therefore, debt can be a less costly form of financing.

A second reason relates to control. If a company issues additional shares to investors, control in the company is shared with the new shareholders. If a company borrows funds, voting control in the company is retained.

Question 9-3 (LO 9-2)

Both interest expense and the carrying value of the note decrease over time. Interest expense decreases with each installment payment. In each of the following periods, the amount that goes to interest expense becomes less and the amount that goes to decreasing the carrying value becomes more. Interest expense decreases over time because the carrying value decreases over time, and interest is a constant percentage of carrying value.

Question 9-4 (LO 9-3)

A lease is a contractual arrangement by which the *lessor* (owner) provides the *lessee* (user) the right to use an asset for a specified period of time. In the balance sheet, a lease asset is reported for the right to use an asset, and a lease liability is reported for the obligation to make lease payments. The amount to report at the beginning of the lease is the present value of the lease payments.

Question 9-5 (LO 9-4)

Bond issue costs include underwriting services, legal, accounting, registration, and printing fees incurred to complete the bond issue. An underwriter is the investment house through which the bonds are sold like JPMorgan Chase, Citigroup, and Bank of America.

Answers to Review Questions (continued)

Question 9-6 (LO 9-4)

A company that borrows by issuing bonds is effectively by-passing the bank and borrowing directly from the investing public, usually at a lower interest rate than from a bank loan. However, issuing bonds entails significant bond issue costs that often exceed 5% of the amount borrowed. For smaller loans, the additional bond issue costs exceed the savings from a lower interest rate, making it more economical to borrow from a bank. For loans of \$20 million or more, the interest rate savings often exceed the additional bond issuance costs, making a bond issue more attractive.

Question 9-7 (LO 9-4)

(a) Secured bonds are supported by assets pledged as collateral. Unsecured bonds, also referred to as debentures, are not backed by a specific asset. (b) Term bonds require payment of the full principal amount of the bond at a single maturity date. Serial bonds require payments in installments over a series of years. (c) Callable bonds allow the issuer to repay the bonds before their scheduled maturity date at a specified call price. Convertible bonds allow the investor to convert each bond into a specified number of shares of common stock.

Question 9-8 (LO 9-4)

Convertible bonds allow the investor to convert each bond into a specified number of shares of common stock. The investor benefits from the conversion feature if share prices rise above the fixed conversion rate. For instance, assume a \$1,000 bond is convertible into 40 shares of common stock, when the stock is trading at \$23 per share. If the stock rises above \$25 ($\$1,000/40$), the shareholder will benefit by converting the bond into 40 common shares of stock. The borrower also benefits. Convertible bonds sell at a higher price and require a lower interest rate than bonds without a conversion feature.

Question 9-9 (LO 9-5)

(a) The face amount is the amount that will be repaid at maturity. The carrying value is the balance in the Bonds Payable account minus any discount or plus any premium. For example a \$100,000 bond that issues for \$93,205 has a face value of \$100,000 and a carrying value of \$93,205 on the date of issue calculated as Bonds Payable of \$100,000 less Discount on Bonds Payable of \$6,795. The carrying value will increase from \$93,205 to \$100,000 over the life of the bond issue. (b) The stated interest rate is the rate used to determine the periodic interest payments paid by the borrower. The market interest rate represents the true interest rate used by investors to value the bond issue.

Answers to Review Questions (continued)

Question 9-10 (LO 9-5)

The bonds issue at a discount when the stated interest rate is less than the market interest rate. The bonds are paying less than the going rate and, therefore, issue at a discount.

Question 9-11 (LO 9-5)

The bonds issue at a premium when the stated interest rate is more than the market interest rate. The bonds are paying more than the going rate and, therefore, issue at a premium.

Question 9-12 (LO 9-5)

If bonds issue at a discount, the carrying value of the bonds and interest expense will increase over time. Recall that interest expense is calculated as the carrying value of the bond times the market interest rate. As carrying value increases, interest expense also increases.

Question 9-13 (LO 9-5)

If bonds issue at a premium, the carrying value of the bonds and interest expense will decrease over time. Recall that interest expense is calculated as the carrying value of the bond times the market interest rate. As carrying value decreases, interest expense also decreases.

Question 9-14 (LO 9-5)

Cash paid is calculated as the face amount of the bonds times the stated interest rate. Interest expense is the carrying value times the market rate. The difference between interest expense and the cash paid increases the carrying value of the bonds. At the maturity date, the carrying value will equal the face amount.

The amortization schedule is similar when bonds are issued at a premium, except that the difference between interest expense and the cash paid *decreases*, rather than increases, the carrying value of the bonds over time.

Question 9-15 (LO 9-6)

If interest rates decrease, a company may choose to buy back high interest rate bonds and reissue bonds at a lower interest rate. A company can help protect itself from decreases in interest rates by including a call feature allowing the company to repurchase bonds at a fixed price (like 2% over face amount). When interest rates decrease, companies with a call provision are more likely to repurchase higher-cost debt and then reissue debt at new lower interest rates.

Another incentive to repay debt early is to improve the company's debt and profitability ratios. Repurchasing debt can improve debt ratios. It can also improve profitability. If interest rates increase, bond prices go down and a company repurchasing the lower priced debt can report a gain on the income statement.

Answers to Review Questions (continued)**Question 9-16 (LO 9-6)**

A loss of \$50,000 is recorded by the issuer retiring the bonds as follows:

Bonds Payable	250,000	
Premium on Bonds Payable	30,000	
Loss	50,000	
Cash		330,000
<i>(Retire bonds before maturity)</i>		

Question 9-17 (LO 9-7)

We calculate the issue price of a bond as the present value of the principal (the face amount on the bond due at maturity) *plus* the present value of the periodic interest payments. It is not solely the present value of the principal; rather it is the present value of the principal plus the present value of the interest payments.

Question 9-18 (LO 9-7)

The cash payment every six months is \$15,000 ($\$500,000 \times .06 \times 6/12$). There will be 40 interest payments over the 20 years – one every six months.

Question 9-19 (LO 9-7)

- (a) \$562,757
- (b) \$500,000
- (c) \$446,612

(Note: These answers are based on a calculator/Excel. Answers using the present value tables may differ just a little due to rounding.)

Question 9-20 (LO 9-8)

Additional debt increases risk. Failure to repay debt or the interest associated with the debt on a timely basis may result in default and perhaps even bankruptcy. Other things being equal, the higher the debt, the higher the risk of bankruptcy. Additional debt also offers potential rewards. If a company earns a return in excess of the cost of borrowing the funds, shareholders are provided with a total return greater than what could have been earned with equity funds alone. Unfortunately, borrowing is not always favorable. Sometimes the cost of borrowing the funds exceeds the returns they generate.

BRIEF EXERCISES

Brief Exercise 9-1 (LO 9-2)

January 1, 2021

Equipment	30,000	
Notes Payable		30,000
<i>(Issue a note payable)</i>		

January 31, 2021

Interest Expense ($\$30,000 \times 5\% \times 1/12$)	125.00	
Notes Payable (difference)	441.14	
Cash (monthly payment)		566.14
<i>(Pay monthly installment on note)</i>		

Brief Exercise 9-2 (LO 9-2)

January 1, 2021

Building	600,000	
Notes Payable		600,000
<i>(Issue a note payable)</i>		

January 31, 2021

Interest Expense ($\$600,000 \times 6\% \times 1/12$)	3,000.00	
Notes Payable (difference)	597.30	
Cash (monthly payment)		3,597.30
<i>(Pay monthly installment on note)</i>		

Brief Exercise 9-3 (LO 9-3)

January 1, 2021

Lease Asset	100,000	
Lease Payable		100,000
<i>(Sign a lease)</i>		

Brief Exercise 9-4 (LO 9-3)

	Assets	Liabilities	Stockholders' Equity
Balance before:	\$600,000	\$400,000	\$200,000
Effect of lease:	+ 40,000	+ 40,000	
Balance after:	\$640,000	\$440,000	\$200,000

Exercise 9-5 (LO 9-4)**Terms**

- e 1. Sinking fund.
- g 2. Secured bond.
- c 3. Unsecured bond.
- f 4. Term bond.
- b 5. Serial bond.
- a 6. Callable bond.
- d 7. Convertible bond.
- h 8. Bond issue costs.

Definitions

- a. Allows the issuer to pay off the bonds early at a fixed price.
- b. Matures in installments.
- c. Secured only by the “full faith and credit” of the issuing corporation.
- d. Allows the investor to transfer each bond into shares of common stock.
- e. Money set aside to pay debts as they come due.
- f. Matures on a single date.
- g. Supported by specific assets pledged as collateral by the issuer.
- h. Includes underwriting, legal, accounting, registration, and printing fees.

Brief Exercise 9-6 (LO 9-5)

1.

January 1, 2021

Cash	70,000	
Bonds Payable		70,000
<i>(Issue bonds at face amount)</i>		

2.

June 30, 2021

Interest Expense	2,450	
Cash ($\$70,000 \times 7\% \times \frac{1}{2}$)		2,450
<i>(Pay semiannual interest)</i>		

Brief Exercise 9-7 (LO 9-5)

1.

January 1, 2021

Cash	63,948	
Discount on Bonds Payable	6,052	
Bonds Payable		70,000
<i>(Issue bonds at a discount)</i>		

2.

June 30, 2021

Interest Expense ($\$63,948 \times 8\% \times \frac{1}{2}$)	2,558	
Discount on Bonds Payable (difference)		108
Cash ($\$70,000 \times 7\% \times \frac{1}{2}$)		2,450
<i>(Pay semiannual interest)</i>		

Brief Exercise 9-8 (LO 9-5)

1.

January 1, 2021

Cash	76,860	
Bonds Payable		70,000
Premium on Bonds Payable		6,860
<i>(Issue bonds at a premium)</i>		

2.

June 30, 2021

Interest Expense ($\$76,860 \times 6\% \times \frac{1}{2}$)	2,306	
Premium on Bonds Payable (difference)	144	
Cash ($\$70,000 \times 7\% \times \frac{1}{2}$)		2,450
<i>(Pay semiannual interest)</i>		

Brief Exercise 9-9 (LO 9-5)

1.

January 1, 2021

Cash	70,000	
Bonds Payable		70,000
<i>(Issue bonds at face amount)</i>		

2.

December 31, 2021

Interest Expense	4,900	
Cash ($\$70,000 \times 7\%$)		4,900
<i>(Pay annual interest)</i>		

Brief Exercise 9-10 (LO 9-5)

1.

January 1, 2021

Cash	64,008	
Discount on Bonds Payable	5,992	
Bonds Payable		70,000
<i>(Issue bonds at a discount)</i>		

2.

December 31, 2021

Interest Expense ($\$64,008 \times 8\%$)	5,121	
Discount on Bonds Payable (difference)		221
Cash ($\$70,000 \times 7\%$)		4,900
<i>(Pay annual interest)</i>		

Brief Exercise 9-11 (LO 9-5)

1.

January 1, 2021

Cash	76,799	
Bonds Payable		70,000
Premium on Bonds Payable		6,799
<i>(Issue bonds at a premium)</i>		

2.

December 31, 2021

Interest Expense ($\$76,799 \times 6\%$)	4,608	
Premium on Bonds Payable (difference)	292	
Cash ($\$70,000 \times 7\%$)		4,900
<i>(Pay annual interest)</i>		

Brief Exercise 9-12 (LO 9-5)

\$2,653 ($\$88,443 \times 6\% \times \frac{1}{2}$).

Brief Exercise 9-13 (LO 9-5)

Interest expense for the year ended December 31, 2021 would be \$4,157. Interest expense for the first six months ended June 30, 2021 is \$2,075 ($\$82,985 \times 5\% \times \frac{1}{2}$). Interest expense for the next six months ended December 31, 2021 is \$2,082 ($[\$82,985 + (\$2,075 - \$1,800)] \times 5\% \times \frac{1}{2}$). Thus, the total interest expense for the year is $\$2,075 + \$2,082 = \$4,157$.

Brief Exercise 9-14 (LO 9-5)

1.

Cash	63,948	
Discount on Bonds Payable	6,052	
Bonds Payable		70,000
<i>(Issue bonds at a discount)</i>		

2.

Interest Expense	2,558	
Discount on Bonds Payable		108
Cash		2,450
<i>(Pay semiannual interest)</i>		

3. Interest expense increases each period because the carrying value of the debt issued at a discount increases over time.

Brief Exercise 9-15 (LO 9-5)

1.

Cash	76,860	
Bonds Payable		70,000
Premium on Bonds Payable		6,860
<i>(Issue bonds at a premium)</i>		

2.

Interest Expense	2,306	
Premium on Bonds Payable	144	
Cash		2,450
<i>(Pay semi-annual interest)</i>		

3. Interest expense decreases each period because the carrying value of the debt issued at a premium decreases over time.

Brief Exercise 9-16 (LO 9-6)

Bonds Payable	70,000	
Loss	3,832	
Discount on Bonds Payable		5,832
Cash		68,000
<i>(Retire bonds before maturity)</i>		

Brief Exercise 9-17 (LO 9-6)

Bonds Payable	70,000	
Premium on Bonds Payable	6,567	
Gain		4,567
Cash		72,000
<i>(Retire bonds before maturity)</i>		

Brief Exercise 9-18 (LO 9-7)

If the market rate is 7%, the bonds will issue at \$60,000 (face amount).

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$60,000
2. Interest payment	PMT	\$2,100 = \$60,000 × 7% × ½ year
3. Periods to maturity	N	20 = 10 years × 2 periods each year
4. Market interest rate	I	3.5% = 7% / 2 periods each year

Calculator Output

Issue price	PV	\$60,000
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Brief Exercise 9-19 (LO 9-7)

If the market rate is 8%, the bonds will issue at \$54,812 (a discount).

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$60,000
2. Interest payment	PMT	\$2,100 = \$60,000 × 7% × ½ year
3. Periods to maturity	N	30 = 15 years × 2 periods each year
4. Market interest rate	I	4% = 8% / 2 periods each year

Calculator Output

Issue price	PV	\$54,812
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Brief Exercise 9-20 (LO 9-7)

If the market rate is 6%, the bonds will issue at \$66,934 (a premium).

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$60,000
2. Interest payment	PMT	\$2,100 = \$60,000 × 7% × ½ year
3. Periods to maturity	N	40 = 20 years × 2 periods each year
4. Market interest rate	I	3% = 6% / 2 periods each year

Calculator Output

Issue price	PV	\$66,934
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Brief Exercise 9-21 (LO 9-8)

1.

Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
\$628	÷	\$99	=	6.34

2.

Net Income	÷	Average Total Assets	=	Return on Assets Ratio
\$66	÷	\$722.5*	=	9.1%

*(\$718 + \$727) / 2

3.

Net Income + Interest + Taxes	÷	Interest	=	Times Interest Earned Ratio
\$125	÷	\$15	=	8.3

EXERCISES

Exercise 9-1 (LO 9-1)

Requirement 1

	<u>Issue Note</u>	<u>Issue Stock</u>
Operating income	\$11,000,000	\$11,000,000
Interest expense (note only)	2,450,000	
Income before tax	<u>8,550,000</u>	<u>11,000,000</u>
Income tax expense (35%)	<u>2,992,500</u>	<u>3,850,000</u>
Net income	<u>\$ 5,557,500</u>	<u>\$ 7,150,000</u>
# of shares	4,000,000	5,000,000
Earnings per share (Net income / # of shares)	<u>\$1.39</u>	<u>\$1.43</u>

Requirement 2

Issuing stock results in higher earnings per share. Issuing the note results in earnings per share of \$1.39 compared with \$1.43 for issuing stock.

Exercise 9-2 (LO 9-2)January 1, 2021

Cash	50,000	
Notes Payable		50,000
<i>(Issue a note payable)</i>		

January 31, 2021

Interest Expense ($\$50,000 \times 6\% \times 1/12$)	250.00	
Notes Payable (difference)	578.64	
Cash (monthly payment)		828.64
<i>(Pay monthly installment on note)</i>		

February 28, 2021

Interest Expense ($[\$50,000 - 578.64] \times 6\% \times 1/12$)	247.11	
Notes Payable (difference)	581.53	
Cash (monthly payment)		828.64
<i>(Pay monthly installment on note)</i>		

Exercise 9-3 (LO 9-2)

Requirement 1

January 1, 2021

Land	800,000	
Notes Payable		800,000
<i>(Issue a note payable for land)</i>		

Requirement 2

June 30, 2021

Interest Expense ($\$800,000 \times 6\% \times 6/12$)	24,000.00	
Notes Payable (difference)	191,221.64	
Cash (semiannual payment)		215,221.64
<i>(Pay annual installment on note)</i>		

December 31, 2021

Interest Expense ($[\$800,000 - 191,221.64] \times 6\% \times 6/12$)	18,263.35	
Notes Payable (difference)	196,958.29	
Cash (annual payment)		215,221.64
<i>(Pay annual installment on note)</i>		

Requirement 3

$$\text{Notes Payable} = \$800,000 - \$191,221.64 - \$196,958.29 = \$411,820.07$$

$$\text{Interest Expense} = \$24,000.00 + \$18,263.35 = \$42,263.35$$

Exercise 9-4 (LO 9-3, LO 9-8)

Requirement 1

Assets	=	Liabilities	+	Stockholders' Equity
\$25 million		\$15 million		?

Stockholders' equity must be \$10 million (\$25 million – \$15 million).

Requirement 2

Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
\$15 million	÷	\$10 million	=	1.50

Requirement 3

Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
\$15 + \$2 = \$17 million	÷	\$10 million	=	1.70

Requirement 4

Yes. A higher ratio typically indicates greater risk.

Exercise 9-5 (LO 9-3)

Requirement 1

PV of lease payments = \$3,618.18 × 22.110544* = \$80,000 (rounded)

* Present value of an annuity; n = 24; i = 8%/12

Requirement 2

June 1, 2021

Lease Asset	80,000	
Lease Payable		80,000
<i>(Record a 24-month lease)</i>		

Exercise 9-6 (LO 9-3)**Requirement 1**

PV of lease payments = $\$29,122.87 \times 17.16864^* = \$500,000$ (rounded)

* Present value of an annuity; $n = 20$; $i = 6\%/4$ (Table 4)

Requirement 2**June 30, 2021**

Lease Asset	500,000	
Lease Payable		500,000
<i>(Record a 20-quarter lease)</i>		

Exercise 9-7 (LO 9-5)January 1, 2021

Cash	500,000	
Bonds Payable		500,000
<i>(Issue bonds at face amount)</i>		

June 30, 2021

Interest Expense	22,500	
Cash ($\$500,000 \times 9\% \times \frac{1}{2}$)		22,500
<i>(Pay semiannual interest)</i>		

December 31, 2021

Interest Expense	22,500	
Cash ($\$500,000 \times 9\% \times \frac{1}{2}$)		22,500
<i>(Pay semiannual interest)</i>		

Exercise 9-8 (LO 9-5)**Requirement 1**

(1)	(2)	(3)	(4)	(5)
Date	Cash Paid Face Amount <u>x 4.5%</u> <u>Stated Rate</u>	Interest Expense Carrying Value <u>x 5% Market</u> <u>Rate</u>	Increase in Carrying Value <u>(3) - (2)</u>	Carrying Value Prior Carrying Value + (4)
1/1/2021				\$ 457,102
6/30/2021	\$ 22,500	\$ 22,855	\$ 355	457,457
12/31/2021	22,500	22,873	373	457,830

Requirement 2January 1, 2021

Cash	457,102	
Discount on Bonds Payable	42,898	
Bonds Payable		500,000
<i>(Issue bonds at a discount)</i>		

June 30, 2021

Interest Expense	22,855	
Discount on Bonds Payable (difference)		355
Cash ($\$500,000 \times 9\% \times \frac{1}{2}$)		22,500
<i>(Pay semiannual interest)</i>		

December 31, 2021

Interest Expense	22,873	
Discount on Bonds Payable (difference)		373
Cash ($\$500,000 \times 9\% \times \frac{1}{2}$)		22,500
<i>(Pay semiannual interest)</i>		

Exercise 9-9 (LO 9-5)**Requirement 1**

(1) Date	(2) Cash Paid Face Amount x 4.5% Stated Rate	(3) Interest Expense Carrying Value x 4% Market Rate	(4) Decrease in Carrying Value (2) – (3)	(5) Carrying Value Prior Carrying Value – (4)
1/ 1 /2021				\$ 549,482
6/30/2021	\$ 22,500	\$ 21,979	\$ 521	548,961
12/31/2021	22,500	21,958	542	548,419

Requirement 2January 1, 2021

Cash	549,482	
Bonds Payable		500,000
Premium on Bonds Payable		49,482
<i>(Issue bonds at a premium)</i>		

June 30, 2021

Interest Expense	21,979	
Premium on Bonds Payable (difference)	521	
Cash ($\$500,000 \times 9\% \times \frac{1}{2}$)		22,500
<i>(Pay semiannual interest)</i>		

December 31, 2021

Interest Expense	21,958	
Premium on Bonds Payable (difference)	542	
Cash ($\$500,000 \times 9\% \times \frac{1}{2}$)		22,500
<i>(Pay semiannual interest)</i>		

Exercise 9-10 (LO 9-5)January 1, 2021

Cash	600,000	
Bonds Payable		600,000
<i>(Issue bonds at face amount)</i>		

June 30, 2021

Interest Expense	21,000	
Cash ($\$600,000 \times 7\% \times \frac{1}{2}$)		21,000
<i>(Pay semiannual interest)</i>		

December 31, 2021

Interest Expense	21,000	
Cash ($\$600,000 \times 7\% \times \frac{1}{2}$)		21,000
<i>(Pay semiannual interest)</i>		

Exercise 9-11 (LO 9-5)**Requirement 1**

(1)	(2)	(3)	(4)	(5)
Date	Cash Paid	Interest Expense	Increase in Carrying Value	Carrying Value
	Face Amount x 3.5% Stated Rate	Carrying Value x 4% Market Rate	(3) – (2)	Prior Carrying Value + (4)
1/ 1 /2021				\$ 559,229
6/30/2021	\$ 21,000	\$ 22,369	\$ 1,369	560,598
12/31/2021	21,000	22,424	1,424	562,022

Requirement 2January 1, 2021

Cash	559,229	
Discount on Bonds Payable	40,771	
Bonds Payable		600,000
<i>(Issue bonds at a discount)</i>		

June 30, 2021

Interest Expense	22,369	
Discount on Bonds Payable (difference)		1,369
Cash ($\$600,000 \times 7\% \times \frac{1}{2}$)		21,000
<i>(Pay semiannual interest)</i>		

December 31, 2021

Interest Expense	22,424	
Discount on Bonds Payable (difference)		1,424
Cash ($\$600,000 \times 7\% \times \frac{1}{2}$)		21,000
<i>(Pay semiannual interest)</i>		

Exercise 9-12 (LO 9-5)

Requirement 1

(1)	(2)	(3)	(4)	(5)
Date	Cash Paid Face Amount <u>x 3.5%</u> <u>Stated Rate</u>	Interest Expense Carrying Value <u>x 3% Market</u> <u>Rate</u>	Decrease in Carrying Value <u>(2) – (3)</u>	Carrying Value Prior Carrying Value – (4) <u>Value – (4)</u>
1/ 1 /2021				\$ 644,632
6/30/2021	\$ 21,000	\$ 19,339	\$ 1,661	642,971
12/31/2021	21,000	19,289	1,711	641,260

Requirement 2

January 1, 2021

Cash	644,632	
Bonds Payable		600,000
Premium on Bonds Payable		44,632
<i>(Issue bonds at a premium)</i>		

June 30, 2021

Interest Expense	19,339	
Premium on Bonds Payable (difference)	1,661	
Cash ($\$600,000 \times 7\% \times \frac{1}{2}$)		21,000
<i>(Pay semi-annual interest)</i>		

December 31, 2021

Interest Expense	19,289	
Premium on Bonds Payable (difference)	1,711	
Cash ($\$600,000 \times 7\% \times \frac{1}{2}$)		21,000
<i>(Pay semi-annual interest)</i>		

Exercise 9-13 (LO 9-5)

January 1, 2021

Cash	600,000	
Bonds Payable		600,000
<i>(Issue bonds at face amount)</i>		

December 31, 2021

Interest Expense	42,000	
Cash ($\$600,000 \times 7\%$)		42,000
<i>(Pay annual interest)</i>		

December 31, 2022

Interest Expense	42,000	
Cash ($\$600,000 \times 7\%$)		42,000
<i>(Pay annual interest)</i>		

Exercise 9-14 (LO 9-5)**Requirement 1**

(1) Date	(2) Cash Paid Face Amount x 7% Stated Rate	(3) Interest Expense Carrying Value x 8% Market Rate	(4) Increase in Carrying Value (3) – (2)	(5) Carrying Value Prior Carrying Value + (4)
1/1/2021				\$ 559,740
12/31/2021	\$ 42,000	\$ 44,779	\$ 2,779	562,519
12/31/2022	42,000	45,002	3,002	565,521

Requirement 2January 1, 2021

Cash	559,740	
Discount on Bonds Payable	40,260	
Bonds Payable		600,000
<i>(Issue bonds at a discount)</i>		

December 31, 2021

Interest Expense	44,779	
Discount on Bonds Payable (difference)		2,779
Cash (\$600,000 × 7%)		42,000
<i>(Pay annual interest)</i>		

December 31, 2022

Interest Expense	45,002	
Discount on Bonds Payable (difference)		3,002
Cash (\$600,000 × 7%)		42,000
<i>(Pay annual interest)</i>		

Exercise 9-15 (LO 9-5)**Requirement 1**

(1) Date	(2) Cash Paid Face Amount x 7% Stated Rate	(3) Interest Expense Carrying Value x 6% Market Rate	(4) Decrease in Carrying Value (2) – (3)	(5) Carrying Value Prior Carrying Value – (4)
1/ 1 /2021				\$ 644,161
12/31/2021	\$ 42,000	\$ 38,650	\$ 3,350	640,811
12/31/2022	42,000	38,449	3,551	637,260

Requirement 2January 1, 2021

Cash	644,161	
Bonds Payable		600,000
Premium on Bonds Payable		44,161
<i>(Issue bonds at a premium)</i>		

December 31, 2021

Interest Expense	38,650	
Premium on Bonds Payable (difference)	3,350	
Cash (\$600,000 × 7%)		42,000
<i>(Pay annual interest)</i>		

December 31, 2022

Interest Expense	38,449	
Premium on Bonds Payable (difference)	3,551	
Cash (\$600,000 × 7%)		42,000
<i>(Pay annual interest)</i>		

Exercise 9-18 (LO 9-7)**Requirement 1**

Premium. The issue price is \$45,057,519

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$41,000,000
2. Interest payment	PMT	\$1,845,000 = \$41,000,000 × 9% × ½ year
3. Periods to maturity	N	40 = 20 years × 2 periods each year
4. Market interest rate	I	4% = 8% / 2 periods each year

Calculator Output

Issue price	PV	\$45,057,519
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Requirement 2

Face amount. The issue price is \$41,000,000.

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$41,000,000
2. Interest payment	PMT	\$1,845,000 = \$41,000,000 × 9% × ½ year
3. Periods to maturity	N	40 = 20 years × 2 periods each year
4. Market interest rate	I	4.5% = 9% / 2 periods each year

Calculator Output

Issue price	PV	\$41,000,000
-------------	----	--------------

Requirement 3

Discount. The issue price is \$37,482,387

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$41,000,000
2. Interest payment	PMT	\$1,845,000 = \$41,000,000 × 9% × ½ year
3. Periods to maturity	N	40 = 20 years × 2 periods each year
4. Market interest rate	I	5% = 10% / 2 periods each year

Calculator Output

Issue price	PV	\$37,482,387
-------------	----	--------------

Exercise 9-19 (LO 9-7)**Requirement 1**

Premium. The issue price is \$27,934,072.

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$26,000,000
2. Interest payment	PMT	\$910,000 = \$26,000,000 x 7% × ½ year
3. Periods to maturity	N	20 = 10 years × 2 periods each year
4. Market interest rate	I	3% = 6% / 2 periods each year

Calculator Output

Issue price	PV	\$27,934,072
-------------	----	--------------

Requirement 2

Face amount. The issue price is \$26,000,000.

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$26,000,000
2. Interest payment	PMT	\$910,000 = \$26,000,000 × 7% × ½ year
3. Periods to maturity	N	20 = 10 years × 2 periods each year
4. Market interest rate	I	3.5% = 7% / 2 periods each year

Calculator Output

Issue price	PV	\$26,000,000
-------------	----	--------------

Requirement 3

Discount. The issue price is \$24,233,258.

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$26,000,000
2. Interest payment	PMT	\$910,000 = \$26,000,000 × 7% × ½ year
3. Periods to maturity	N	20 = 10 years × 2 periods each year
4. Market interest rate	I	4% = 8% / 2 periods each year

Calculator Output

Issue price	PV	\$24,233,258
-------------	----	--------------

Exercise 9-20 (LO 9-8)**Requirement 1**

	Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
E-Travel	\$4,254,475	÷	\$3,182,681	=	1.34
Pricecheck	\$486,610	÷	\$1,607,614	=	0.30

E-Travel has a higher debt to equity ratio than Pricecheck.

Requirement 2

	Net Income + Interest + Taxes	÷	Interest	=	Times Interest Earned Ratio
E-Travel	\$588,159	÷	\$94,233	=	6.2
Pricecheck	\$600,724	÷	\$34,084	=	17.6

Pricecheck, with a times interest earned ratio of 17.6, is better able to meet interest payments as they become due than E-Travel with a ratio of only 6.2.

Exercise 9-21 (LO 9-2, LO 9-8)**Requirement 1**

<u>January 1</u>	Debit	Credit
Cash	100,000	
Notes Payable (Long-term)		100,000
<i>(Issue a long-term note payable)</i>		
<u>January 4</u>	Debit	Credit
Cash	31,000	
Accounts Receivable		31,000
<i>(Receive cash on account)</i>		
<u>January 11</u>	Debit	Credit
Accounts Payable	11,000	
Cash		11,000
<i>(Pay cash on account)</i>		
<u>January 15</u>	Debit	Credit
Salaries Expense	28,900	
Cash		28,900
<i>(Pay for salaries)</i>		
<u>January 30</u>	Debit	Credit
Cash	65,000	
Accounts Receivable	130,000	
Sales Revenue		195,000
<i>(Sell inventory for cash and on account)</i>		
Cost of Goods Sold	112,500	
Inventory		112,500
<i>(Record cost of inventory sold)</i>		
<u>January 31</u>	Debit	Credit
Interest Expense	583	
Notes Payable (Long-term)	1,397	
Cash		1,980
<i>(Pay monthly installment on long-term note)</i>		
<i>(\$583 = \$100,000 × 7% × 1/12)</i>		

Exercise 9-21 (continued)**Requirement 2**

<u>(a) January 31</u>	<u>Debit</u>	<u>Credit</u>
Depreciation Expense	800	
Accumulated Depreciation		800
<i>(Record depreciation for January)</i>		
<i>(\$800 = [$\\$120,000 - \\$24,000$] / 120 months)</i>		
<u>(b) January 31</u>	<u>Debit</u>	<u>Credit</u>
Bad Debt Expense	2,300	
Allowance for Uncollectible Accounts		2,300
<i>(Adjust uncollectible accounts)</i>		
<i>(\$2,300 = [$\\$3,000 \times 50\%$] + [$\\$130,000^a \times 2\%$] - \$1,800)</i>		
<i>^a \$130,000 = \$34,000 - \$31,000 + \$130,000 - \$3,000</i>		
<u>(c) January 31</u>	<u>Debit</u>	<u>Credit</u>
Salaries Expense	26,100	
Salaries Payable		26,100
<i>(Adjust salaries payable)</i>		
<u>(d) January 31</u>	<u>Debit</u>	<u>Credit</u>
Income Tax Expense	8,000	
Income Tax Payable		8,000
<i>(Adjust income taxes)</i>		
<u>(e) January 31</u>	<u>Debit</u>	<u>Credit</u>
Notes Payable (Long-term)	17,411	
Notes Payable (Current)		17,411
<i>(Reclassify current portion of note payable)</i>		

*Exercise 9-21 (continued)***Requirement 3**

**Freedom Fireworks
Adjusted Trial Balance
January 31, 2021**

Accounts	Debit	Credit
Cash	\$165,320	
Accounts Receivable	133,000	
Allowance for Uncollectible Accounts		\$ 4,100
Inventory	39,500	
Land	67,300	
Buildings	120,000	
Accumulated Depreciation		10,400
Accounts Payable		6,700
Salaries Payable		26,100
Income Tax Payable		8,000
Notes Payable (Current)		17,411
Notes Payable (Long-term)		81,192
Common Stock		200,000
Retained Earnings		155,400
Sales Revenue		195,000
Cost of Goods Sold	112,500	
Salaries Expense	55,000	
Bad Debt Expense	2,300	
Depreciation Expense	800	
Interest Expense	583	
Income Tax Expense	8,000	
Totals	\$704,303	\$704,303

*Exercise 9-21 (continued)***Requirement 3 (continued)**

Accounts	Ending Balance	=	Beginning balance in bold , entries during January in blue , and adjusting entries in red .
Cash	\$165,320	=	11,200 +100,000+31,000-11,000-28,900+65,000-1,980
Accounts Receivable	133,000	=	34,000 -31,000+130,000
Allow for Uncoll Accts	4,100	=	1,800 +2,300
Inventory	39,500	=	152,000 -112,500
Land	67,300	=	67,300
Buildings	120,000	=	120,000
Accumulated Depreciation	10,400	=	9,600 +800
Accounts Payable	6,700	=	17,700 -11,000
Salaries Payable	26,100	=	26,100
Income Tax Payable	8,000	=	8,000
Notes Payable (Current)	17,411	=	17,411
Notes Payable (Long-term)	81,192	=	100,000 - 1,397 -17,411
Common Stock	200,000	=	200,000
Retained Earnings	155,400	=	155,400
Sales Revenue	195,000	=	195,000
Cost of Goods Sold	112,500	=	112,500
Salaries Expense	55,000	=	28,900+26,100
Bad Debt Expense	2,300	=	2,300
Depreciation Expense	800	=	800
Interest Expense	583	=	583
Income Tax Expense	8,000	=	8,000

*Exercise 9-21 (continued)***Requirement 4**

Freedom Fireworks		
Multiple-Step Income Statement		
For the year month ended January 31, 2021		
Sales revenue	\$195,000	
Cost of goods sold	<u>112,500</u>	
Gross profit		\$ 82,500
Salaries expense	55,000	
Bad debt expense	2,300	
Depreciation expense	<u>800</u>	
Total operating expenses		<u>58,100</u>
Operating income		24,400
Interest expense		<u>583</u>
Income before taxes		23,817
Income tax expense		<u>8,000</u>
Net income		<u><u>\$ 15,817</u></u>

Requirement 5

Freedom Fireworks			
Classified Balance Sheet			
January 31, 2021			
<u>Assets</u>		<u>Liabilities</u>	
Cash	\$165,320	Accounts payable	\$ 6,700
Accounts receivable	133,000	Salaries payable	26,100
Less: Allowance	<u>(4,100)</u>	Income tax payable	8,000
Inventory	<u>39,500</u>	Notes payable (Current)	<u>17,411</u>
Total current assets	333,720	Total current liabilities	58,211
		Notes payable (Long-term)	<u>81,192</u>
		Total liabilities	139,403
Land	67,300	<u>Stockholders' Equity</u>	
Buildings	120,000	Common stock	200,000
Less: Accumulated Depreciation	<u>(10,400)</u>	Retained earnings	<u>171,217</u> *
		Total stockholders' equity	<u>371,217</u>
Total assets	<u><u>\$510,620</u></u>	Total liabilities and stockholders' equity	<u><u>\$510,620</u></u>

* Retained earnings = Beginning retained earnings + Net income – Dividends
= \$155,400 + \$15,817 – \$0
= \$171,217

Exercise 9-21 (concluded)**Requirement 6**

January 31, 2021	Debit	Credit
Sales Revenue	195,000	
Retained Earnings (Close revenue accounts)		195,000
Retained Earnings	179,183	
Cost of Goods Sold		112,500
Salaries Expense		55,000
Bad Debt Expense		2,300
Depreciation Expense		800
Interest Expense		583
Income Tax Expense (Close expense accounts)		8,000

Requirement 7

(a) The debt to equity ratio is:

$$\text{Debt to Equity Ratio} = \frac{\text{Total Liabilities}}{\text{Stockholders' Equity}} = \frac{\$139,403}{\$371,217} = \mathbf{0.38}$$

Freedom Fireworks is **less** leveraged than the industry average. Freedom Fireworks has a lower proportion of liabilities in relation to stockholders' equity than the industry average of 1.0.

(b) The times interest earned ratio is:

$$\text{Times Interest Earned Ratio} = \frac{\text{Net Income} + \text{Interest Expense} + \text{Tax Expense}}{\text{Interest Expense}} = \frac{\$15,817 + \$583 + \$8,000}{\$583} = \mathbf{41.9}$$

Compared to the industry average of 20 times, Freedom Fireworks is **more** able to meet interest payments than other companies in the same industry.

(c) Based on the debt to equity ratio and the times interest earned ratio, Freedom Fireworks would more likely receive a **lower** interest rate than the average borrowing rate in the industry. Freedom Fireworks carries less debt than the industry average and is better able to meet interest payments than the average company in the industry.

PROBLEMS: SET A

Problem 9-1A (LO 9-2)

Requirement 1

January 1, 2021

Building	360,000	
Cash		60,000
Notes Payable		300,000
<i>(Issue a mortgage note payable)</i>		

Requirement 2

(1)	(2)	(3)	(4)	(5)
Date	Cash Paid	Interest Expense	Decrease in Carrying Value	Carrying Value
	Monthly Payment	Carrying Value $\times 0.07 \times 1/12$	(2) – (3)	Prior Carrying Value – (4)
1/1/2021				\$ 300,000.00
1/31/2021	\$3,483.25	\$ 1,750.00	\$ 1,733.25	298,266.75
2/28/2021	3,483.25	1,739.89	1,743.36	296,523.39

Requirement 3

January 31, 2021

Interest Expense ($\$300,000 \times 7\% \times 1/12$)	1,750.00	
Notes Payable (difference)	1,733.25	
Cash (monthly payment)		3,483.25
<i>(Pay monthly installment on note)</i>		

In the first monthly payment, \$1,750.00 goes to interest expense and \$1,733.25 goes to reducing the carrying value of the loan.

Requirement 4

Total payments on the loan are \$417,990. Since actual payments on the loan are \$300,000, the remainder of \$117,990 is the amount paid for interest expense.

Problem 9-2A (LO 9-2)**Requirement 1****January 1, 2021**

Cash	2,000,000	
Notes Payable		2,000,000
<i>(Issue a note payable)</i>		

Requirement 2

Date	Cash Paid	Interest Expense	Decrease in Carrying Value	Carrying Value
				2,000,000
12/31/2021	776,067	160,000	616,067	1,383,933
12/31/2022	776,067	110,715	665,352	718,581
12/31/2023	776,067	57,486	718,581	0

Requirement 3**December 31, 2021**

Interest Expense	160,000	
Notes Payable	616,067	
Cash		776,067
<i>(Pay annual installment on note)</i>		

December 31, 2022

Interest Expense	110,715	
Notes Payable	665,352	
Cash		776,067
<i>(Pay annual installment on note)</i>		

December 31, 2023

Interest Expense	57,486	
Notes Payable	718,581	
Cash		776,067
<i>(Pay annual installment on note)</i>		

Problem 9-3A (LO 9-3, 9-8)

Requirement 1

Assets	=	Liabilities	+	Stockholders' Equity
\$81 million		\$11 + \$41 = \$52 million		?

Stockholders' equity must be \$29 million (\$81 million - \$52 million).

Requirement 2

Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
\$52 million	÷	\$29 million	=	1.79

Requirement 3

(\$ in millions)

Lease Asset	16	
Lease Payable <i>(Record a lease)</i>		16

Requirement 4

Yes.

The revised debt to equity ratio of 2.34 is greater than the 2.0 ratio required in the bond agreement.

Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
\$52 + 16 = 68 million	÷	\$29 million	=	2.34

Problem 9-4A (LO 9-5)**Requirement 1**January 1, 2021

Cash	600,000	
Bonds Payable		600,000
<i>(Issue bonds at face amount)</i>		

June 30, 2021

Interest Expense	24,000	
Cash ($\$600,000 \times 8\% \times \frac{1}{2}$)		24,000
<i>(Pay semiannual interest)</i>		

December 31, 2021

Interest Expense	24,000	
Cash ($\$600,000 \times 8\% \times \frac{1}{2}$)		24,000
<i>(Pay semiannual interest)</i>		

Requirement 2January 1, 2021

Cash	544,795	
Discount on Bonds Payable	55,205	
Bonds Payable		600,000
<i>(Issue bonds at a discount)</i>		

June 30, 2021

Interest Expense ($\$544,795 \times 9\% \times \frac{1}{2}$)	24,516	
Discount on Bonds Payable (difference)		516
Cash ($\$600,000 \times 8\% \times \frac{1}{2}$)		24,000
<i>(Pay semiannual interest)</i>		

December 31, 2021

Interest Expense ($[\$544,795 + \$516] \times 9\% \times \frac{1}{2}$)	24,539	
Discount on Bonds Payable (difference)		539
Cash ($\$600,000 \times 8\% \times \frac{1}{2}$)		24,000
<i>(Pay semiannual interest)</i>		

Requirement 3January 1, 2021

Cash	664,065	
Bonds Payable		600,000
Premium on Bonds Payable		64,065
<i>(Issue bonds at a premium)</i>		

June 30, 2021

Interest Expense ($\$664,065 \times 7\% \times \frac{1}{2}$)	23,242	
Premium on Bonds Payable (difference)	758	
Cash ($\$600,000 \times 8\% \times \frac{1}{2}$)		24,000
<i>(Pay semiannual interest)</i>		

December 31, 2021

Interest Expense ($[\$664,065 - \$758] \times 7\% \times \frac{1}{2}$)	23,216	
Premium on Bonds Payable (difference)	784	
Cash ($\$600,000 \times 8\% \times \frac{1}{2}$)		24,000
<i>(Pay semiannual interest)</i>		

Problem 9-5A (LO 9-5)

1. Discount
2. \$37,281,935
3. \$40,000,000
4. 7% ($\$1,400,000 \text{ cash paid} \div \$40,000,000 \text{ face value}$) $\times 2$
5. 8% ($\$1,491,277 \text{ interest expense} \div \$37,281,935 \text{ carrying value}$) $\times 2$
6. \$28,000,000 ($\$1,400,000 \times 20 \text{ payments}$)

Problem 9-6A (LO 9-5)**Requirement 1**

(1)	(2)	(3)	(4)	(5)
Date	Cash Paid	Interest Expense	Increase in Carrying Value	Carrying Value
	Face Amount x 4% Stated Rate	Carrying Value x 4.5% Market Rate	(3) – (2)	Prior Carrying Value + (4)
1/ 1 /2021				\$ 841,464
6/30/2021	\$ 36,000	\$ 37,866	\$ 1,866	843,330
12/31/2021	36,000	37,950	1,950	845,280

Requirement 2January 1, 2021

Cash	841,464	
Discount on Bonds Payable	58,536	
Bonds Payable		900,000
<i>(Issue bonds at a discount)</i>		

Requirement 3June 30, 2021

Interest Expense ($\$841,464 \times 9\% \times \frac{1}{2}$)	37,866	
Discount on Bonds Payable (difference)		1,866
Cash ($\$900,000 \times 8\% \times \frac{1}{2}$)		36,000
<i>(Pay semiannual interest)</i>		

December 31, 2021

Interest Expense ($\$843,330 \times 9\% \times \frac{1}{2}$)	37,950	
Discount on Bonds Payable (difference)		1,950
Cash ($\$900,000 \times 8\% \times \frac{1}{2}$)		36,000
<i>(Pay semiannual interest)</i>		

Problem 9-7A (LO 9-5, 9-7)**Requirement 1**

Face amount. The issue price is \$1,300,000.

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$1,300,000
2. Interest payment	PMT	\$45,500 = \$1,300,000 × 7% × ½ year
3. Periods to maturity	N	30 = 15 years × 2 periods each year
4. Market interest rate	I	3.5% = 7% / 2 periods each year

Calculator Output

(1)	(2)	(3)	(4)	(5)
Date	Cash Paid	Interest Expense	Increase in Carrying Value	Carrying Value
	Face Amount x 3.5% <u>Stated Rate</u>	Carrying Value x 3.5% Market <u>Rate</u>	<u>(3) – (2)</u>	Prior Carrying Value + (4)
1/ 1 /2021				\$ 1,300,000
6/30/2021	\$ 45,500	\$ 45,500	\$ 0	1,300,000
12/31/2021	45,500	45,500	0	1,300,000

Requirement 2

Discount. The issue price is \$1,187,602.

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$1,300,000
2. Interest payment	PMT	\$45,500 = \$1,300,000 × 7% × ½ year
3. Periods to maturity	N	30 = 15 years × 2 periods each year
4. Market interest rate	I	4% = 8% / 2 periods each year

Calculator Output

Issue price	PV	\$1,187,602
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(1) Date	(2) Cash Paid Face Amount x 3.5% Stated Rate	(3) Interest Expense Carrying Value x 4% Market Rate	(4) Increase in Carrying Value (3) – (2)	(5) Carrying Value Prior Carrying Value + (4)
1/1/2021				\$ 1,187,602
6/30/2021	\$ 45,500	\$ 47,504	\$ 2,004	1,189,606
12/31/2021	45,500	47,584	2,084	1,191,690

Requirement 3

Premium. The issue price is \$1,427,403.

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$1,300,000
2. Interest payment	PMT	\$45,500 = \$1,300,000 × 7% × ½ year
3. Periods to maturity	N	30 = 15 years × 2 periods each year
4. Market interest rate	I	3% = 6% / 2 periods each year

Calculator Output

Issue price	PV	\$1,427,403
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(1)	(2)	(3)	(4)	(5)
Date	Cash Paid Face Amount <u>x 3.5%</u> <u>Stated Rate</u>	Interest Expense Carrying Value <u>x 3% Market</u> <u>Rate</u>	Decrease in Carrying Value <u>(2) – (3)</u>	Carrying Value Prior Carrying Value – (4)
1/ 1 /2021				\$ 1,427,403
6/30/2021	\$ 45,500	\$ 42,822	\$ 2,678	1,424,725
12/31/2021	45,500	42,742	2,758	1,421,967

Problem 9-8A (LO 9-8)**Requirement 1**

(\$ in millions)	Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
Bahama Bay	\$5,724	÷	\$3,137	=	1.82
Caribbean Key	\$2,819	÷	\$4,821	=	0.58

Bahama Bay has a higher debt to equity ratio than Caribbean Key.

Requirement 2

(\$ in millions)	Net Income	÷	Average Total Assets	=	Return on Assets Ratio
Bahama Bay	\$562	÷	\$9,210.5*	=	6.1%
Caribbean Key	\$88	÷	\$7,573.5**	=	1.2%

* $(\$8,861 + \$9,560) / 2$

** $(\$7,640 + \$7,507) / 2$

Bahama Bay is more profitable than Caribbean Key.

Requirement 3

(\$ in millions)	Net Income + Interest + Taxes	÷	Interest	=	Times Interest Earned Ratio
Bahama Bay	\$880	÷	\$170	=	5.2
Caribbean Key	\$166	÷	\$70	=	2.4

Bahama Bay, with a times interest earned ratio of 5.2, is better able to meet interest payments as they become due than Caribbean Key with a ratio of only 2.4.

PROBLEMS: SET B

Problem 9-1B (LO 9-2)

Requirement 1

January 1, 2021

Building	610,000	
Cash		110,000
Notes Payable		500,000
<i>(Issue a mortgage note payable)</i>		

Requirement 2

(1)	(2)	(3)	(4)	(5)
Date	Cash Paid	Interest Expense	Decrease in Carrying Value	Carrying Value
	Monthly Payment	Carrying Value x 0.09 × 1/12	(2) – (3)	Prior Carrying Value – (4)
1/1/2021				\$ 500,000.00
1/31/2021	\$ 5,071.33	\$ 3,750.00	\$ 1,321.33	498,678.67
2/28/2021	5,071.33	3,740.09	1,331.24	497,347.43

Requirement 3

January 31, 2021

Interest Expense ($\$500,000 \times 9\% \times 1/12$)	3,750.00	
Notes Payable (difference)	1,321.33	
Cash (monthly payment)		5,071.33
<i>(Pay monthly installment on note)</i>		

In the first monthly payment, \$3,750.00 goes to interest expense and only \$1,321.33 goes to reducing the carrying value of the loan.

Requirement 4

Over the 15 year mortgage, \$412,839 is interest expense and \$500,000 goes to reducing the carrying value of the loan. Interest expense over the 15 year mortgage is calculated as the total payments of \$912,839 minus the \$500,000 carrying value of the loan.

Problem 9-2B (LO 9-2)**Requirement 1****January 1, 2021**

Cash	9,000,000	
Notes Payable		9,000,000
<i>(Issue a note payable)</i>		

Requirement 2

Date	Cash Paid	Interest Expense	Decrease in Carrying Value	Carrying Value
				9,000,000
12/31/2021	2,657,053	630,000	2,027,053	6,972,947
12/31/2022	2,657,053	488,106	2,168,947	4,804,000
12/31/2023	2,657,053	336,280	2,320,773	2,483,227
12/31/2023	2,657,053	173,826	2,483,227	0

Requirement 3**December 31, 2021**

Interest Expense	630,000	
Notes Payable	2,027,053	
Cash		2,657,053
<i>(Pay annual installment on note)</i>		

December 31, 2022

Interest Expense	488,106	
Notes Payable	2,168,947	
Cash		2,657,053
<i>(Pay annual installment on note)</i>		

December 31, 2023

Interest Expense	336,280	
Notes Payable	2,320,773	
Cash		2,657,053
<i>(Pay annual installment on note)</i>		

December 31, 2024

Interest Expense	173,826	
Notes Payable	2,483,227	
Cash		2,657,053
<i>(Pay annual installment on note)</i>		

Problem 9-3B (LO 9-3, 9-8)**Requirement 1**

Assets	=	Liabilities	+	Stockholders' Equity
\$201 million		\$91 + \$61 = \$152 million		?

Stockholders' equity must be \$49 million (\$201 million - \$152 million).

Requirement 2

Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
\$152 million		\$49 million		3.10

Requirement 3

(\$ in millions)

Lease Asset	26	
Lease Payable		26
<i>(Record a lease agreement)</i>		

Requirement 4

Yes.

The revised debt to equity ratio of 3.63 is greater than the 3.25 ratio required in the bond agreement.

Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
\$152 + 26 = 178 million		\$49 million		3.63

Problem 9-4B (LO 9-5)**Requirement 1**January 1, 2021

Cash	3,000,000	
Bonds Payable		3,000,000
<i>(Issue bonds at face amount)</i>		

June 30, 2021

Interest Expense	135,000	
Cash ($\$3,000,000 \times 9\% \times \frac{1}{2}$)		135,000
<i>(Pay semiannual interest)</i>		

December 31, 2021

Interest Expense	135,000	
Cash ($\$3,000,000 \times 9\% \times \frac{1}{2}$)		135,000
<i>(Pay semiannual interest)</i>		

Requirement 2January 1, 2021

Cash	2,813,067	
Discount on Bonds Payable	186,933	
Bonds Payable		3,000,000
<i>(Issue bonds at a discount)</i>		

June 30, 2021

Interest Expense ($\$2,813,067 \times 10\% \times \frac{1}{2}$)	140,653	
Discount on Bonds Payable (difference)		5,653
Cash ($\$3,000,000 \times 9\% \times \frac{1}{2}$)		135,000
<i>(Pay semiannual interest)</i>		

December 31, 2021

Interest Expense ($[\$2,813,067 + \$5,653] \times 10\% \times \frac{1}{2}$)	140,936	
Discount on Bonds Payable (difference)		5,936
Cash ($\$3,000,000 \times 9\% \times \frac{1}{2}$)		135,000
<i>(Pay semiannual interest)</i>		

Requirement 3January 1, 2021

Cash	3,203,855	
Bonds Payable		3,000,000
Premium on Bonds Payable		203,855
<i>(Issue bonds at a premium)</i>		

June 30, 2021

Interest Expense ($\$3,203,855 \times 8\% \times \frac{1}{2}$)	128,154	
Premium on Bonds Payable (difference)	6,846	
Cash ($\$3,000,000 \times 9\% \times \frac{1}{2}$)		135,000
<i>(Pay semiannual interest)</i>		

December 31, 2021

Interest Expense ($[\$3,203,855 - \$6,846] \times 8\% \times \frac{1}{2}$)	127,880	
Premium on Bonds Payable (difference)	7,120	
Cash ($\$3,000,000 \times 9\% \times \frac{1}{2}$)		135,000
<i>(Pay semiannual interest)</i>		

Problem 9-5B (LO 9-5)

- Premium
- \$66,934,432
- \$60,000,000
- 7% ($\$2,100,000 \text{ cash paid} \div \$60,000,000 \text{ face value}) \times 2$
- 6% ($\$2,008,033 \text{ interest expense} \div \$66,934,432 \text{ carrying value}) \times 2$
- \$84,000,000 ($\$2,100,000 \times 40 \text{ payments}$)

Problem 9-6B (LO 9-5)**Requirement 1**

(1)	(2)	(3)	(4)	(5)
Date	Cash Paid Face Amount x 3.5% Stated Rate	Interest Expense Carrying Value x 3% Market Rate	Decrease in Carrying Value (2) – (3)	Carrying Value Prior Carrying Value – (4)
1/ 1 /2021				\$ 1,098,002
6/30/2021	\$ 35,000	\$ 32,940	\$ 2,060	1,095,942
12/31/2021	35,000	32,878	2,122	1,093,820

Requirement 2January 1, 2021

Cash	1,098,002
Bonds Payable	1,000,000
Premium on Bonds Payable	98,002
<i>(Issue bonds at a premium)</i>	

Requirement 3June 30, 2021

Interest Expense ($\$1,098,002 \times 6\% \times \frac{1}{2}$)	32,940
Premium on Bonds Payable (difference)	2,060
Cash ($\$1,000,000 \times 7\% \times \frac{1}{2}$)	35,000
<i>(Pay semiannual interest)</i>	

December 31, 2021

Interest Expense ($\$1,095,942 \times 6\% \times \frac{1}{2}$)	32,878
Premium on Bonds Payable (difference)	2,122
Cash ($\$1,000,000 \times 7\% \times \frac{1}{2}$)	35,000
<i>(Pay semiannual interest)</i>	

Problem 9-7B (LO 9-5, 9-7)**Requirement 1**

Face amount. The issue price is \$850,000.

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$850,000
2. Interest payment	PMT	\$25,500 = \$850,000 × 6% × ½ year
3. Periods to maturity	N	20 = 10 years × 2 periods each year
4. Market interest rate	I	3% = 6% / 2 periods each year

Calculator Output

(1)	(2)	(3)	(4)	(5)
Date	Cash Paid	Interest Expense	Increase in Carrying Value	Carrying Value
	Face Amount x 3% Stated <u>Rate</u>	Carrying Value x 3% Market <u>Rate</u>	<u>(3) – (2)</u>	Prior Carrying Value + (4)
1/ 1 /2021				\$ 850,000
6/30/2021	\$ 25,500	\$ 25,500	\$ 0	850,000
12/31/2021	25,500	25,500	0	850,000

Requirement 2

Discount. The issue price is \$789,597.

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$850,000
2. Interest payment	PMT	\$25,500 = \$850,000 × 6% × ½ year
3. Periods to maturity	N	20 = 10 years × 2 periods each year
4. Market interest rate	I	3.5% = 7% / 2 periods each year

Calculator Output

Issue price	PV	\$789,597
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(1)	(2)	(3)	(4)	(5)
Date	Cash Paid	Interest Expense	Increase in Carrying Value	Carrying Value
	Face Amount x 3% Stated Rate	Carrying Value x 3.5% Market Rate	(3) – (2)	Prior Carrying Value + (4)
1/ 1 /2021				\$ 789,597
6/30/2021	\$ 25,500	\$ 27,636	\$ 2,136	791,733
12/31/2021	25,500	27,711	2,211	793,944

Requirement 3

Premium. The issue price is \$916,254.

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$850,000
2. Interest payment	PMT	\$25,500 = \$850,000 × 6% × ½ year
3. Periods to maturity	N	20 = 10 years × 2 periods each year
4. Market interest rate	I	2.5% = 5% / 2 periods each year

Calculator Output

Issue price	PV	\$916,254
-------------	----	-----------

(1)	(2)	(3)	(4)	(5)
Date	Cash Paid	Interest Expense	Decrease in Carrying Value	Carrying Value
	Face Amount x 3% Stated <u>Rate</u>	Carrying Value x 2.5% Market <u>Rate</u>	<u>(2) – (3)</u>	Prior Carrying Value – (4)
1/1/2021				\$ 916,254
6/30/2021	\$ 25,500	\$ 22,906	\$ 2,594	913,660
12/31/2021	25,500	22,842	2,658	911,002

Problem 9-8B (LO 9-8)**Requirement 1**

(\$ in millions)	Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
Surf City	\$11,519	÷	\$8,309	=	1.39
Paradise Falls	\$15,232	÷	\$23,929	=	0.64

Surf City has a higher debt to equity ratio than Paradise Falls.

Requirement 2

(\$ in millions)	Net Income	÷	Average Total Assets	=	Return on Assets Ratio
Surf City	\$18	÷	\$19,816*	=	0.1%
Paradise Falls	\$1,298	÷	\$38,899**	=	3.3%

* $(\$19,828 + \$19,804) / 2$

** $(\$39,161 + \$38,637) / 2$

Paradise Falls is more profitable than Surf City.

Requirement 3

(\$ in millions)	Net Income + Interest + Taxes	÷	Interest	=	Times Interest Earned Ratio
Surf City	\$374	÷	\$356	=	1.1
Paradise Falls	\$1,638	÷	\$336	=	4.9

Paradise Falls, with a times interest earned ratio of 4.9, is better able to meet interest payments as they become due than Surf City with a ratio of only 1.1.

ADDITIONAL PERSPECTIVES

Continuing Problem: Great Adventures

AP9-1

Requirement 1

(1)	(2)	(3)	(4)	(5)
Date	Cash Paid Monthly Payment	Interest Expense Carrying Value $\times 6\% \times 1/12$	Decrease in Carrying Value $(2) - (3)$	Carrying Value Prior Carrying Value - (4)
11/ 1 /2022				\$ 500,000
11/30/2022	\$ 5,551	\$ 2,500	\$ 3,051	496,949
12/31/2022	5,551	2,485	3,066	493,883

Requirement 2

November 1, 2022

Land	500,000	
Notes Payable (long-term)		500,000
<i>(Purchase land by issuing a note payable)</i>		

Requirement 3

November 30, 2022

Interest Expense ($\$500,000 \times 6\% \times 1/12$)	2,500	
Notes Payable (difference)	3,051	
Cash (monthly payment)		5,551
<i>(Pay monthly installment on note)</i>		

December 31, 2022

Interest Expense ($\$496,949 \times 6\% \times 1/12$)	2,485	
Notes Payable (difference)	3,066	
Cash (monthly payment)		5,551
<i>(Pay monthly installment on note)</i>		

Balance as of December 31, 2022:

November 1 – Issuance	\$500,000
November 30 – First payment	(3,051)
December 31 – Second payment	<u>(3,066)</u>
Balance	<u>\$493,883</u>

Requirement 4

Current liability*	\$ 38,014
Long-term liability	<u>455,869</u>
	<u>\$493,883</u>

* Portion of note that will be paid within one year of the balance sheet date.

Additional Perspective 9-1 (in General Ledger)

Students will be given the following existing trial balance.

Great Adventures, Inc.
Trial Balance
December 31, 2022
(Prior to transactions in AP9-1)

Accounts	Debit	Credit
Cash	\$ 89,070	
Accounts Receivable	50,000	
Allowance for Uncollectible Accounts		\$ 2,400
Inventory	7,000	
Prepaid Insurance	900	
Land	-0-	
Equipment	62,000	
Accumulated Depreciation		25,250
Accounts Payable		20,800
Deferred Revenue		5,000
Warranty Liability		4,000
Contingent Liability		12,000
Income Tax Payable		14,500
Interest Payable		750
Notes Payable (current)		10,000
Notes Payable (long-term)		20,000
Common Stock		20,000
Retained Earnings		33,450
Service Revenue		44,500
Sales Revenue		120,000
Interest Revenue		120
Sales Discounts	350	
Cost of Goods Sold	38,500	
Depreciation Expense	17,250	
Insurance Expense	5,700	
Rent Expense	2,400	
Salaries Expense	24,000	
Supplies Expense	500	
Bad Debt Expense	2,400	
Repairs and Maintenance Expense	400	
Warranty Expense	4,000	

Chapter 9 - Long-Term Liabilities

Loss	12,000	
Interest Expense	1,800	
Income Tax Expense	14,500	
Totals	<u>\$332,770</u>	<u>\$332,770</u>

Additional Perspective 9-1 (in General Ledger, continued)November 1, 2022

Land	500,000	
Notes Payable (long-term)		500,000
<i>(Purchase land by issuing a note payable)</i>		

November 30, 2022

Interest Expense ($\$500,000 \times 6\% \times 1/12$)	2,500	
Notes Payable (long-term)	3,051	
Cash (monthly payment)		5,551
<i>(Pay monthly installment on note)</i>		

December 31, 2022

Interest Expense ($\$496,949 \times 6\% \times 1/12$)	2,485	
Notes Payable (long-term)	3,066	
Cash (monthly payment)		5,551
<i>(Pay monthly installment on note)</i>		

December 31, 2022

Notes Payable (long-term)	38,014	
Notes Payable (current)		38,014
<i>(Reclassify portion of long-term note payable as current)</i>		

Additional Perspective 9-1 (in General Ledger, continued)

Great Adventures, Inc.		
Income Statement		
For the period ended December 31, 2022		
Service revenue	\$ 44,500	
Sales revenue	120,000	
Sales discounts	(350)	
Net sales	<u>164,150</u>	
Cost of goods sold	<u>38,500</u>	
Gross profit		\$125,650
Depreciation Expense	17,250	
Insurance Expense	5,700	
Rent Expense	2,400	
Salaries Expense	24,000	
Supplies Expense	500	
Bad Debt Expense	2,400	
Repairs and Maintenance Expense	400	
Warranty Expense	4,000	
Loss	<u>12,000</u>	
Total operating expenses		<u>68,650</u>
Operating income (loss)		57,000
Interest revenue		120
Interest expense		<u>(6,785)</u>
Income before income taxes		50,335
Income tax expense		<u>14,500</u>
Net income		<u>\$ 35,835</u>

Additional Perspective 9-1 (in General Ledger, continued)

Great Adventures, Inc.
Balance Sheet
December 31, 2022

<u>Assets</u>		<u>Liabilities</u>	
Current assets:		Current liabilities:	
Cash	\$ 77,968	Accounts payable	\$ 20,800
Accounts receivable	50,000	Deferred Revenue	5,000
Allow for Uncoll Accts	(2,400)	Warranty Liability	4,000
Inventory	7,000	Contingent Liability	12,000
Prepaid Insurance	900	Income tax payable	14,500
Total current assets	133,468	Interest payable	750
		Notes Payable (current)	48,014
		Total current liabilities	105,064
		Notes payable (long-term)	475,869
		Total liabilities	580,933
Long-term assets:			
Land	500,000	<u>Stockholders' Equity</u>	
Equipment	62,000	Common stock	20,000
Accumulated depreciation	(25,250)	Retained earnings	69,285
		Total stockholders' equity	89,285
		Total liabilities and	
Total assets	\$670,218	stockholders' equity	\$670,218

Additional Perspective 9-1 (in General Ledger, concluded)

<u>Dec. 31, 2022</u>	<u>Debit</u>	<u>Credit</u>
Service Revenue	44,500	
Sales Revenue	120,000	
Interest Revenue	120	
Sales Discounts		350
Retained Earnings		164,270
<i>(Close revenue accounts)</i>		
<u>Dec. 31, 2022</u>		
Retained Earnings	128,435	
Cost of Goods Sold		38,500
Depreciation Expense		17,250
Insurance Expense		5,700
Rent Expense		2,400
Salaries Expense		24,000
Supplies Expense		500
Bad Debt Expense		2,400
Repairs and Maintenance Expense		400
Warranty Expense		4,000
Loss		12,000
Interest Expense		6,785
Income Tax Expense		14,500
<i>(Close expense accounts)</i>		

Financial Analysis: American Eagle

AP9-2

(\$ in thousands)

Requirement 1

	Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
2018	\$569,522	÷	\$1,246,791	=	0.46
2017	\$578,091	÷	\$1,204,569	=	0.48

The ratio **decreased** in the more recent year.

Requirement 2

	Net Income	÷	Average Total Assets	=	Return on Assets
2018	\$204,163	÷	$(\$1,816,313 + 1,782,660)/2$	=	11.3%

This rate **exceeds** the approximate cost of borrowing.

Requirement 3

The bankruptcy risk of American Eagle is **low**. The company carries very little debt and has several large lines of credit that it could use to borrow in the future if necessary.

Financial Analysis: Buckle

AP9-3

(\$ in thousands)

Requirement 1

	Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
2018	\$146,868	÷	\$391,248	=	0.38
2017	\$149,308	÷	\$430,539	=	0.35

The ratio **increased** in the more recent year.

Requirement 2

	Net Income	÷	Average Total Assets	=	Return on Assets
2018	\$89,707	÷	(\$538,116 + \$579,847)/2	=	16.0%

This rate **exceeds** the approximate cost of borrowing.

Requirement 3

The bankruptcy risk of The Buckle is **low**. The company carries no bank borrowings and has an unsecured line of credit that it could use to borrow in the future if necessary.

Comparative Analysis: American Eagle vs. Buckle

AP9-4

(\$ in thousands)

Requirement 1

	Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
American Eagle	\$569,522	÷	\$1,246,791	=	0.46
Buckle	\$146,868	÷	\$391,248	=	0.38

American Eagle has a riskier (higher) debt to equity ratio. The ratios are both much **lower** than those for Coca-Cola and Pepsi reported in the chapter. The soft-drink industry maintains a higher debt to equity ratio than the retail clothing industry.

Requirement 2

	Net Income	÷	Average Total Assets	=	Return on Assets Ratio
American Eagle	\$204,163	÷	(\$1,816,313 + 1,782,660)/2	=	11.3%
Buckle	\$89,707	÷	(\$538,116 + \$579,847)/2	=	16.0%

Buckle appears more profitable.

Ethics

AP9-5

1. Current liabilities are understated and long-term liabilities are overstated by \$447,116.

Current liabilities are defined as debt that is due within one year of the balance sheet date. Because \$447,116 of the principal will be paid in the following year, this portion of the long-term note should be classified as current.

2.

	Current Ratio		Debt to Equity Ratio	
	Current Assets/ Current Liabilities		Total Liabilities / Total Equity	
With Jim's suggestion	\$3,100,000 / \$2,700,000	= 1.15	\$5,283,026 / \$4,000,000	= 1.32
Without Jim's suggestion	\$3,100,000 / \$3,147,116	= 0.99	\$5,283,026 / \$4,000,000	= 1.32

3. Yes.

By misclassifying the current portion of the note as part of long-term liabilities, the current ratio is overstated. Thus, the company's ability to pay its debt in the following year is overstated. Lenders may not understand the company's true ability to pay debt. The expectation of using long-term profits to pay long-term debt is not a justification for the misclassification. There are no guarantees that those profits will exist, and to the extent the company cannot pay its debt in the following year, longer-term profits are not helpful. The debt to equity ratio does not reveal this misclassification because the numerator is total liabilities. Whether the debt is classified as current or long-term has no effect on the reported amount of total liabilities.

4. No.

The portion of the note that is due within one year of the balance sheet date (\$447,116) should be reported as a current liability. The portion of the note due in more than one year should be classified as a long-term liability (\$2,135,910 = \$2,583,026 – \$447,116).

Internet Research

AP9-6

This case provides an opportunity for students to learn more about credit ratings at Standard & Poor's. This case also allows students to access current items in the business press. Answers to the assignment will vary depending on the news items chosen.

Written Communication

AP9-7

Requirement 1

A company that borrows by issuing bonds is effectively by-passing the bank and borrowing directly from the investing public, usually at a lower interest rate than it would in a bank loan. However, issuing bonds entails significant bond issue costs for the underwriter, legal fees, and accounting costs. For smaller loans, the additional bond issuance costs exceed the savings from a lower interest rate, making it more economical to borrow from a bank. For loans of \$20 million or more, the interest rate savings often exceed the additional bond issuance costs, making a bond issue more attractive.

Requirement 2

One of the primary reasons for issuing bonds over issuing common stock relates to taxes. Interest expense incurred when borrowing money is tax deductible, while dividends paid to stockholders are *not* tax deductible. Therefore, debt can be a less costly form of financing.

Requirement 3

The price of a bond is calculated as the present value of the principal (the face amount on the bond due at maturity) *plus* the present value of the periodic interest payments. The stated rate is used to calculate the periodic interest payment each period. The market rate is used to calculate the present value of the principal and periodic interest payments.

Earnings Management

AP9-8

Requirement 1

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$100,000,000
2. Interest payment	PMT	\$3,000,000 = \$100,000,000 × 6% × ½ year
3. Periods to maturity	N	30 = 15 years × 2 periods each year
4. Market interest rate	I	2.5% = 5% / 2 periods each year

Calculator Output

Issue price	PV	\$110,465,146
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Requirement 2

Calculator Input

Bond Characteristics	Key	Amount
1. Face amount	FV	\$100,000,000
2. Interest payment	PMT	\$3,000,000 = \$100,000,000 × 6% × ½ year
3. Periods to maturity	N	20 = 10 years × 2 periods each year
4. Market interest rate	I	2.5% = 5% / 2 periods each year

Calculator Output

Issue price	PV	\$107,794,581
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Requirement 3**Calculator Input**

Bond Characteristics	Key	Amount
1. Face amount	FV	\$100,000,000
2. Interest payment	PMT	\$3,000,000 = \$100,000,000 × 6% × ½ year
3. Periods to maturity	N	20 = 10 years × 2 periods each year
4. Market interest rate	I	4.5% = 9% / 2 periods each year

Calculator Output

Issue price	PV	\$80,488,095
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Requirement 4

December 31, 2021

Bonds Payable	100,000,000	
Premium on Bonds Payable	7,794,581	
Gain		27,306,486
Cash		80,488,095
<i>(Retire bonds before maturity)</i>		

The transaction increases net income by the amount of the gain, \$27,306,486.

Requirement 5

No.

Investors likely would not agree with David Plesko's plan. To report the \$27 million gain on repurchase, the company must give up bonds costing only \$6 million (\$100 million times 6%) in interest each year and reissue new bonds requiring the payment of \$9 million (\$100 million times 9%) in interest each year. The additional interest cost of \$3 million each year will reduce the company's cash flows.