Chapter 12
Non-current Financial Liabilities

N. Problems

P12-1. ***Suggested solution:***

a. Companies may be motivated to keep debt off the balance sheet so as to improve key financial ratios and free up borrowing capacity.
b. Examples of obligations that were previously off-balance-sheet but now have to be recognized include: i) those emanating from derivative contracts; ii) special-purpose entities; iii) decommissioning costs; and iv) finance leases.

P12-2. ***Suggested solution:***

a.	**Proposal one**		**Proposal two**	
Estimated EBIT		$300,000		$300,000
Less: Interest	$2,000,000 × 4%	80,000	$3,000,000 × 4%	120,000
Income before taxes		220,000		180,000
Income taxes	$220,000 × 30%	66,000	$180,000 × 30%	54,000
Net income after taxes		$154,000		$126,000
ROE (Net income / Market value of equity)	$154,000 / $2,000,000	**7.7%**	$126,000 / $1,000,000	**12.6%**
b. Proposal two results in the higher of the two estimated ROEs (Proposal two ROE 12.6% > proposal one ROE 7.7%)				
c. The primary benefit to the shareholders of adopting proposal two is the higher envisaged return. Drawbacks to increased financial leverage include a heightened risk of loss if estimates are not realized and an increased risk of bankruptcy.				

P12-3. ***Suggested solution:***

a. Financial leverage quantifies the relationship between the relative level of a firm's debt and its equity base. Financial leverage offers investors the opportunity to increase their return on equity when the business performs well but in so doing exposes them to an increased risk of loss and bankruptcy.
b. The function of debt rating agencies is to provide investors with an independent evaluation of the riskiness of debt securities and in so doing assist investors in making informed investment decisions.
c. Financial liabilities are contractual obligations to deliver cash or other financial assets to another party.
d. Companies sell notes directly to the investing public to reduce interest costs. They do this by decreasing or eliminating the spread charged by financial intermediaries.

P12-4. ***Suggested solution:***

a. A bond indenture is the contract that outlines the terms of the bond, including the maturity date; rate of interest and interest payment dates; security pledged; and financial covenants.
b. A covenant is the borrower's promise to restrict certain activities. There are both positive and negative covenants. A positive covenant is one where the borrower promises to do something, e.g., maintain a current ratio in excess of 2:1. A negative covenant is one in which the borrower pledges *not* to do something, e.g., will not pay dividends without the lender's prior consent.
c. Companies issue bonds for reasons that include reducing the cost of borrowing and accessing large amounts of capital.
d. Corporations usually engage an investment bank to underwrite (sell) the bonds on its behalf on either a firm commitment or a best-efforts basis. The more common method is the firm commitment underwriting, where the investment bank guarantees the borrower a price for the bonds. Another arrangement is the best-efforts approach, where the broker agrees to try to sell as much of the issue as possible to investors.

P12-5. ***Suggested solution:***

- Callable bonds permit the issuing company to "call" for the bonds to be redeemed before maturity.
- Convertible bonds can be exchanged or "converted" for other securities in the corporation, usually ordinary shares.
- Debentures are unsecured bonds.
- Real-return bonds provide protection against inflation. While the mechanics differ slightly across issues, the basic premise is that the principal owed is indexed to inflation; thus, at maturity the principal is repaid at the inflated amount.
- Perpetual bonds are bonds that never mature.
- Secured bonds are bonds backed by specific collateral such as a mortgage on real estate.
- Serial bonds are bonds issued at the same time that mature at regular intervals, rather than all on the same date.
- Stripped (zero-coupon) bonds are bonds that do not pay interest. Stripped bonds are sold at a discount and mature at face value.

P12-6. ***Suggested solution:***

Discount to be amortized per period ($5,000,000 - $4,850,000) / (5 × 2) = $15,000 Interest expense per period ($5,000,000 × 4% / 2) + $15,000 = $115,000		
a. Journal entry on issuance (Jan. 1, 2018)		
Dr. Cash (Sales proceeds – transaction costs)	4,850,000	
Cr. Bonds payable ($4,900,000 – $50,000)		4,850,000
b. Journal entry on interest payment date (July 1, 2018)		
Dr. Interest expense (from above)	115,000	
Cr. Cash ($5,000,000 × 4% / 2)		100,000

Cr. Bonds payable ($115,000 - $100,000)		15,000
c. Journal entry at year-end (Dec. 31, 2018)		
Dr. Interest expense (from above)	115,000	
Cr. Interest payable ($5,000,000 × 4% / 2)		100,000
Cr. Bonds payable ($115,000 - $100,000)		15,000

P12-7. ***Suggested solution:***

a.	The fair value of the note is determined using discounted cash flow analysis. ▪ PVFA(0.5%, 36) = 1/0.005 - 1/0.005(1.005)^{36} = 32.8710 ▪ PV of the note = $1,000 × PVFA(0.5%, 36) = $1,000 x 32.8710 = $32,871 Or using a BAII PLUS financial calculator ▪ 36N, 0.50 I/Y, 1,000 PMT, CPT PV PV = –32,871 (rounded)		
	Dr. Automobile	32,871	
	Cr. Notes payable		32,871
b.	Dr. Interest expense [$32,871 × 0.50% = $164 (rounded)]	164	
	Cr. Notes payable*		164
	Dr. Notes payable*	1,000	
	Cr. Cash		1,000
	*May be combined		

P12-8. ***Suggested solution:***

a.	The fair value of the note is determined using discounted cash flow analysis.		
	Value of principal = $10,000 / 1.04^3		$8,890
	Value of coupons = $200 × PVFA(4%,3) = $200 × 2.77509		555
	Total		$9,445
	Using a BAII PLUS financial calculator ▪ 3 N, 4 I/Y, 10000 FV, 200 PMT, CPT PV PV = –9,445 (rounded)		
	Dr. Office furniture	9,445	
	Cr. Notes payable		9,445
b.	Dr. Interest expense [$9,445 × 4% = $378 (rounded)]	378	
	Cr. Cash		200
	Cr. Notes payable		178

P12-9. ***Suggested solution:***

Premium to be amortized per period ($5,180,000 - $5,000,000) / (6 × 2) = $15,000 Interest expense per period ($5,000,000 × 6% / 2) - $15,000 = $135,000		
a. Journal entry on issuance (Jan. 1, 2019)		
Dr. Cash (Net sales proceeds $5,200,000 – $20,000)	5,180,000	
Cr. Bonds payable		5,180,000
b. Journal entry on interest payment date (July 1, 2019)		
Dr. Interest expense (from above)	135,000	
Dr. Bonds payable ($150,000 - $135,000)	15,000	
Cr. Cash ($5,000,000 × 6% / 2)		150,000
c. Journal entry at year-end (Dec. 31, 2019)		
Dr. Interest expense (from above)	135,000	
Dr. Bonds payable ($150,000 - $135,000)	15,000	
Cr. Interest payable ($5,000,000 × 6% / 2)		150,000

d. A firm commitment underwriting is when the investment bank guarantees the borrower a price for the bonds, expecting to resell them to its investment clients at a profit. The best efforts approach is when the broker simply agrees to try to sell as much of the issue as possible to investors.

P12-10. ***Suggested solution:***

a. Journal entry on issuance (May 1, 2016)		
Dr. Cash ($1,000,000 + $13,333)	1,013,333	
Cr. Bonds payable		1,000,000
Cr. Accrued interest payable ($1,000,000 × 4% × 4/12)		13,333
b. Journal entry on interest payment date (June 30, 2016)		
Dr. Accrued interest payable	13,333	
Dr. Interest expense ($1,000,000 × 4% × 2/12)	6,667	
Cr. Cash		20,000
c. Journal entry on interest payment date (Dec. 31, 2016)		
Dr. Interest expense ($1,000,000 × 4%/2)	20,000	
Cr. Cash		20,000

P12-11. ***Suggested solution:***

Most non-current financial liabilities are initially valued at fair value minus debt issue costs. Fair value is determined by, in order of preference: using active market values; referencing recent

similar transactions; and employing discounted cash flow analysis. The debt and equity components of compound financial instruments must be separately valued.

After issuance, most non-current financial liabilities are measured at amortized cost using the effective interest method. The effective interest method charges the original premium or discount, and debt issue costs to interest expense over the life of the liability.

The one exception to the foregoing is financial liabilities at fair value through profit and loss, commonly referred to as at fair value through profit or loss financial liabilities. At fair value through profit or loss liabilities are valued initially and subsequently at fair value. All transaction costs are expensed. Changes in market value are reported on the income statement.

P12-12. ***Suggested solution:***

a(i). Series A will sell at a discount as the coupon rate is less than the market rate of interest
a(ii). Series B will sell at par as the coupon rate equals the market rate of interest
a(iii). Series C will sell at a premium as the coupon rate exceeds the market rate of interest

b. All series: the principal amount = $1,000,000; the number of payments = 6 × 2 = 12; and the market rate of interest = 6%/2 = 3%

b(i). Coupon interest payment = $1,000,000 × (5%/2) = $25,000

- PV of coupons = $25,000 × PVFA(3%, 12) = $25,000 × 9.9540 = $248,850
- PV of principal = $1,000,000/$1.03^{12}$ = $701,380
- PV of the note = $248,850 + $701,380 = $950,230

Using a BAII PLUS financial calculator:

- 12N, 3 I/Y, 25,000 PMT, 1000000 FV, CPT PV PV = –950,230 (rounded)

Journal entry on issue date—Series A

Dr. Cash	950,230	
Cr. Bonds payable		950,230

b(ii). Coupon interest payment = $1,000,000 × (6%/2) = $30,000

- PV of coupons = $30,000 × PVFA(3%, 12) = $30,000 × 9.9540 = $298,620
- PV of principal = $1,000,000/$1.03^{12}$ = $701,380
- PV of the note = $298,620 + $701,380 = $1,000,000

Using a BAII PLUS financial calculator:

- 12N, 3 I/Y, 30,000 PMT; 1000000 FV, CPT PV PV = –1,000,000

Journal entry on issue date—Series B

Dr. Cash	1,000,000	
Cr. Bonds payable		1,000,000

b(iii). Coupon interest payment = $1,000,000 × (7%/2) = $35,000

- PV of coupons = $35,000 × PVFA(3%, 12) = $35,000 × 9.9540 = $348,390
- PV of principal = $1,000,000/$1.03^{12}$ = $701,380
- PV of the note = $348,390 + $701,380 = $1,049,770

Using a BAII PLUS financial calculator:
- 12N, 3 I/Y, 35,000 PMT; 1000000 FV, CPT PV PV = –1,049,770 (rounded)

Journal entry on issue date—Series C

Dr. Cash	1,049,770	
Cr. Bonds payable		1,049,770

P12-13. ***Suggested solution:***

Determining the effective interest rate for the period using a BAII PLUS financial calculator
- The net proceeds (PV) to Escape are $3,860,000 ($3,900,000 – $40,000);N = 10 (5 × 2); PMT = $80,000 ($4,000,000 × 4% × 6/12)
- 10 N, 3860000 +/– PV, 4000000 FV, 80000 PMT, CPT I/Y I/Y = 2.3978% (rounded)

Spreadsheet

Effective period rate			2.3978%					
Date	Interest expense		Interest paid		Discount amortized		Amortized cost	
Jan. 1, 2016							$3,860,000	(a)
July 1, 2016	$92,555	(b)	$80,000	(c)	$12,555	(d)	3,872,555	(e)
Jan. 1, 2017	92,856	(f)	80,000		12,856		3,885,411	

(a) $3,900,000 – $40,000 = $3,860,000
(b) $3,860,000 × 2.3978% = $92,555
(c) $4,000,000 × 4%/2 = $80,000
(d) $92,555 – $80,000 = $12,555
(e) $3,860,000 + $12,555 = $3,872,555
(f) $3,872,555 × 2.3978% = $92,856

a. Journal entry on issuance (Jan. 1, 2016)

Dr. Cash (Sales proceeds – transaction costs)	3,860,000	
Cr. Bonds payable ($3,900,000 – $40,000)		3,860,000

b. Journal entry on interest payment date (July 1, 2016)

Dr. Interest expense ($3,860,000 × 2.3978%)	92,555	
Cr. Cash		80,000
Cr. Bonds payable ($92,555 – $80,000)		12,555

c. Journal entry at year-end (Dec. 31, 2016)

Dr. Interest expense ($3,872,555 × 2.3978%)	92,856	
Cr. Interest payable		80,000
Cr. Bonds payable ($92,856 – $80,000)		12,856

P12-14. ***Suggested solution:***

Determining the effective interest rate for the period using a BAII PLUS financial calculator

- The net proceeds (PV) to Australian are $4,180,000 ($4,200,000 – $20,000); N = 10 (5 × 2); PMT = $80,000 ($4,000,000 × 4% × 6/12)
- 10 N, 4180000 +/– PV, 4000000 FV, 80000 PMT, CPT I/Y I/Y = 1.5117% (rounded)

Spreadsheet

Effective period rate			1.5117%					
Date	Interest expense		Interest paid		Premium amortized		Amortized cost	
Jan. 1, 2018							$4,180,000	(a)
July 1, 2018	$63,191	(b)	$80,000	(c)	$16,809	(d)	4,163,191	(e)
Jan. 1, 2019	62,937	(f)	80,000		17,063		4,146,128	
(a) net sales proceeds $4,200,000 – $20,000								
(b) $4,180,000 × 1.5117% = $63,191								
(c) $4,000,000 × 4%/2 = $80,000								
(d) $80,000 – $63,191 = $16,809								
(e) $4,180,000 – $16,809 = $4,163,191								
(f) $4,163,191 × 1.5117% = $62,937								

a. Journal entry on issuance (Jan. 1, 2018)

Dr. Cash (Net sales proceeds $4,200,000 – $20,000)	4,180,000	
Cr. Bonds payable		4,180,000

b. Journal entry on interest payment date (July 1, 2018)

Dr. Interest expense ($4,180,000 × 1.5117%)	63,191	
Dr. Bonds payable ($80,000 – $63,191)	16,809	
Cr. Cash		80,000

c. Journal entry at year-end (Dec. 31, 2018)

Dr. Interest expense ($4,163,191 × 1.5117%)	62,937	
Dr. Bonds payable ($80,000 – $62,937)	17,063	
Cr. Interest payable		80,000

P12-15. ***Suggested solution:***

Determining the effective interest rate for the period using a BAII PLUS financial calculator

- The net proceeds (PV) to Really are $1,890,000 ($1,900,000 – $10,000); N = 10 (5 × 2); PMT = $50,000 ($2,000,000 × 5% × 6/12)
- 10 N, 1890000 +/– PV, 2000000 FV, 50000 PMT, CPT I/Y I/Y = 3.1497% (rounded)

Spreadsheet

Effective period rate			3.1497%					
Date	Interest expense		Interest paid		Discount amortized		Amortized cost	
Jan. 1, 2016							$1,890,000	(a)
July 1, 2016	$59,529	(b)	$50,000	(c)	$9,529	(d)	1,899,529	(e)
Jan. 1, 2017	59,829	(f)	50,000		9,829		1,909,358	

(a) $1,900,000 – $10,000 = $1,890,000

(b) $1,890,000 × 3.1497% = $59,529

(c) $2,000,000 × 5%/2 = $50,000

(d) $59,529 – $50,000 = $9,529

(e) $1,890,000 + $9,529 = $1,899,529

(f) $1,899,529 × 3.1497% = $59,829

a. Journal entry on issuance (Jan. 1, 2016)

Dr. Cash (Sales proceeds – transaction costs)	1,890,000	
Cr. Bonds payable ($1,900,000 – $10,000)		1,890,000

b. Journal entry on interest payment date (July 1, 2016)

Dr. Interest expense ($1,890,000 × 3.1497% = $59,529)	59,529	
Cr. Cash		50,000
Cr. Bonds payable ($59,529 – $50,000)		9,529

c. Journal entry at year-end (Dec. 31, 2016)

Dr. Interest expense ($1,899,529 × 3.1497% = $59,829)	59,829	
Cr. Interest payable		50,000
Cr. Bonds payable ($59,829 – $50,000)		9,829

P12-16. ***Suggested solution:***

The fair value of the bond (sales price) is determined using discounted cash flow analysis where:
- N = 20 (10 × 2); PMT = $20,000 ($1,000,000 × 4% × 6/12); I/Y = 1.95% (3.9% /2)

Because the discount rate is not a whole number, the annuity factor is not given in a table, so we need to compute it by formula.

$$PVFA(r,t) = \left(\frac{1}{r} - \frac{1}{r(1+r)^t}\right) = \left(\frac{1}{.0195} - \frac{1}{.0195(1+.0195)^{20}}\right) = 16.4306$$

Value of principal	= $1,000,000 / 1.0195^{20}	$ 679,603
Value of coupons	= $20,000 × PVFA(1.95%,20) = $20,000 × 16.430607	328,612
Total		$1,008,215

Using a BAII PLUS financial calculator
- 20N, 1.95I/Y, 1000000 FV, 20000 PMT, CPT PV PV = –1,008,215 (rounded)

Spreadsheet

Effective period rate			1.9500%					
Date	Interest expense		Interest paid		Premium amortized		Amortized cost	
Jan. 1, 2018							$1,008,215	(a)
Jul. 1, 2018	$19,660	(b)	$20,000	(c)	$340	(d)	1,007,875	(e)
Jan. 1, 2019	19,654	(f)	20,000		346		1,007,529	

(a) sales proceeds

(b) $1,008,215 × 1.95% = $19,660

(c) $1,000,000 × 4%/2 = $20,000

(d) $20,000 – $19,660 = $340

(e) $1,008,215 – $340 = $1,007,875

(f) $1,007,875 × 1.95% = $19,654

a. Journal entry on issuance (Jan. 1, 2018)

Dr. Cash (Sales proceeds)	1,008,215	
Cr. Bonds payable		1,008,215

b. Journal entry at year-end (June 30, 2018)

Dr. Interest expense	19,660	
Dr. Bonds payable ($20,000 – $19,660)	340	
Cr. Interest payable		20,000

c. Journal entry on interest payment date (July 1, 2018)

Dr. Interest payable	20,000	
Cr. Cash		20,000

d. Journal entry on interest payment date (Jan. 1, 2019)		
Dr. Interest expense	19,654	
Dr. Bonds payable ($20,000 – $19,654)	346	
Cr. Cash		20,000

P12-17. ***Suggested solution:***

The bonds are ten year or twenty period bonds. They are issued one-half of the way through the first period so the discount must be amortized over the remaining 19 1/2 periods. Discount to be amortized per period ($1,000,000 - $980,500) / 19.5 = $1,000 Interest expense per period ($1,000,000 × 6% / 2) + $1,000 = $31,000		
a. Journal entry on issuance (April 1, 2017)		
Dr. Cash ($980,500 + $15,000)	995,500	
Cr. Bonds payable		980,500
Cr. Accrued interest payable ($1,000,000 × 6% × 3/12)		15,000
b. Journal entry on interest payment date (June 30, 2017)		
Dr. Accrued interest payable	15,000	
Dr. Interest expense ($31,000 (from above) × 1/ 2)	15,500	
Cr. Bonds payable ($1,000 x 1/2)		500
Cr. Cash ($1,000,000 × 6% / 2)		30,000
c. Journal entry on interest payment date (Dec. 31, 2017)		
Dr. Interest expense (from above)	31,000	
Cr. Bonds payable ($31,000 - $30,000)		1,000
Cr. Cash ($1,000,000 × 6% / 2)		30,000

P12-18. ***Suggested solution:***

The bonds are eight year or 16 period bonds. They are issued one-third of the way through the first period so the premium must be amortized over the remaining 15 2/3 periods. Premium to be amortized per period ($5,009,400 - $5,000,000) / 15 2/3 = $600 Interest expense per period ($5,000,000 × 4% / 2) - $600 = $99,400		
a. Journal entry on issuance (March 1, 2018)		
Dr. Cash ($5,009,400 + $33,333)	5,042,733	
Cr. Bonds payable		5,009,400
Cr. Accrued interest payable ($5,000,000 × 4% × 2/12)		33,333
b. Journal entry on interest payment date (June 30, 2018)		
Dr. Accrued interest payable	33,333	
Dr. Interest expense ($99,400 (from above) × 2/ 3)	66,267	
Dr. Bonds payable ($600 x 2/3)	400	

Cr. Cash ($5,000,000 × 4% / 2)		100,000
c. Journal entry on interest payment date (Dec. 31, 2018)		
Dr. Interest expense (from above)	99,400	
Dr. Bonds payable ($100,000 - $99,400)	600	
Cr. Cash ($5,000,000 × 4% / 2)		100,000

P12-19. ***Suggested solution:***

a. Effective period rate = 4%/2 = 2%

Small differences due to rounding

Straight-line method									**Effective interest method**				
Date	Interest expense		Interest paid		Premium amortized		Amortized cost		Date	Interest expense	Interest paid	Premium amortized	Amortized cost
Jan. 1, 2018							$3,109,882	(a)	Jan. 1, 2018				$3,109,882
June 30, 2018	$61,265	(b)	$75,000	(c)	$13,735	(d)	$3,096,147	(e)	June 30, 2018	$62,198	$75,000	$12,802	$3,097,080
Dec. 31, 2018	$61,265		$75,000		$13,735		$3,082,412		Dec. 31, 2018	$61,942	$75,000	$13,058	$3,084,021
June 30, 2019	$61,265		$75,000		$13,735		$3,068,677		June 30, 2019	$61,680	$75,000	$13,320	$3,070,702
Dec. 31, 2019	$61,264		$75,000		$13,736		$3,054,941		Dec. 31, 2019	$61,414	$75,000	$13,586	$3,057,116
June 30, 2020	$61,265		$75,000		$13,735		$3,041,206		June 30, 2020	$61,142	$75,000	$13,858	$3,043,258
Dec. 31, 2020	$61,265		$75,000		$13,735		$3,027,471		Dec. 31, 2020	$60,865	$75,000	$14,135	$3,029,123
June 30, 2021	$61,265		$75,000		$13,735		$3,013,736		June 30, 2021	$60,582	$75,000	$14,418	$3,014,706
Dec. 31, 2021	$61,264		$75,000		$13,736		$3,000,000		Dec. 31, 2021	$60,294	$75,000	$14,706	$3,000,000
	$490,118		$600,000		$109,882					$490,118	$600,000	$109,882	

(a) given

(b) $75,000 – $13,735 = $61,265

(c) $3,000,000 × 5%/2 = $75,000

(d) $3,109,882 – $3,000,000 = $109,882; $109,882/8 = $13,735 (rounded)

(e) $3,109,882 – $13,735 = $3,096,147

b(i). Cash flow for each of the periods is not affected. Irrespective of the method chosen to account for the amortization of the bond premium, the cash outflow is $75,000 on each interest payment date.

b(ii). The total interest expense over the life of the bond is $490,118 under both the effective interest and straight-line methods.

b(iii). If the straight-line method is chosen, reported profitability will be higher than that under the effective rate method in 2018 and 2019 but lower in 2020 and 2021. (Interest expense is initially lower under the straight-line method; hence, net income will be higher.)

P12-20. ***Suggested solution:***

Part a

The market rate of interest for similar transactions is 0.5% per month (6%/12 = 0.5) as established by Simply's independent offer of financing. The present value of the consideration given up and hence the potential purchase price is:

Option i.	$40,000
Option ii.	$39,445
Option iii.	$39,708

Option ii.

- PVFA(0.5%, 36) = 1/0.005 - 1/0.005(1.005)^{36} = 32.8710
- Payments = $43,200/36 = $1,200
- PV of the note = $1,200 × PVFA(0.5%, 36) = $1,200 x 32.8710 = $39,445

Using a BAII PLUS financial calculator

- 36N, 0.50 I/Y, 1200 PMT, CPT PV PV = –39,445 (rounded)

Option iii.

- PVFA(0.75%, 36) = 1/0.0075 - 1/0.0075(1.0075)^{36} = 31.4468
- Required payment = $38,000/31.4468 = 1,208 (rounded)
- PV of the note = $1,208 × PVFA(0.5%, 36) = $1,208 x 32.8710 = $39,708 (rounded)

Using a BAII PLUS financial calculator

- 36N, 0.75 I/Y, +/-38000 PV, CPT PMT PMT = 1,208 (rounded)
- 36N, 0.5 I/Y, 1208 PMT, CPT PV PV = –39,708 (rounded)

The best offer is option ii. as Simply can acquire the vehicle for a cash equivalent price of $39,445.

Part b

(i).	Dr. Automobile	39,708	
	Cr. Notes payable		39,708
(ii).	Dr. Interest expense [$39,708 × 0.5% = $199) (rounded)]	199	
	Dr. Notes payable ($1,208 – $199)	1,009	
	Cr. Cash (from previous payment calculation)		1,208

P12-21. ***Suggested solution:***

Part a

The present value of the consideration given up and hence the potential purchase price is:

Option i.	$250,000
Option ii.	$252,847
Option iii.	$247,075

Option ii.

- PVFA(0.4%, 48) = 1/0.004 - 1/0.004(1.004)^{48} = 43.5942
- Payments = $278,400/48 = $5,800
- PV of the note = $5,800 × PVFA(0.4%, 48) = $5,800 x 43.5942 = $252,846 (rounded)

Using a BAII PLUS financial calculator

- 48N, 0.4 I/Y, 5800 PMT, CPT PV PV = –252,847 (rounded)

Option iii.

- PVFA(0.5%, 60) = 1/0.005 - 1/0.005(1.005)^{60} = 51.7256
- Required payment = $240,000/51,7256 = 4,640 (rounded)
- PVFA(0.4%, 60) = 1/0.004 - 1/0.004(1.004)^{60} = 53.2489
- PV of the note = $4,640 × PVFA(0.4%, 60) = $4,640 x 53.2489 = $247,075 (rounded)

Using a BAII PLUS financial calculator

- 60N, 0.5 I/Y, +/-240000 PV, CPT PMT PMT = 4,640 (rounded)
- 60N, 0.4 I/Y, 4640 PMT, CPT PV PV = –247,075 (rounded)

Part b

The best offer is option iii. as Outstanding can acquire the data management system for a cash equivalent price of $247,075.

Part c

Option ii.

(1)	Dr. Data management system	252,847	
	Cr. Notes payable		252,847
(2)	Dr. Interest expense [$252,847 × 0.4% = $1,011) (rounded)]	1,011	
	Dr. Notes payable ($5,800 – $1,011)	4,789	
	Cr. Cash (from previous payment calculation)		5,800

Option iii.

(1)	Dr. Data management system	247,075	
	Cr. Notes payable		247,075
(2)	Dr. Interest expense [$247,075 × 0.4% = $988) (rounded)]	988	
	Dr. Notes payable ($4,640 – $3,652)	3.652	
	Cr. Cash (from previous payment calculation)		4,640

P12-22. ***Suggested solution:***

a.	The fair value of the note is determined using discounted cash flow analysis. ▪ PVFA(0.3%, 48) = 1/0.003 - 1/0.003(1.003)^{48} = 44.6419 ▪ PV of the note = $1,050 × PVFA(0.3%, 48) = $1,050 x 44.6419 = $46,874 Or using a BAII PLUS financial calculator ▪ 48N, 0.30 I/Y, 1,050 PMT, CPT PV PV = –46,874 (rounded)		
	Dr. Automobile	56,874	
	Cr. Notes payable		46,874
	Cr. Cash		10,000
b.	Dr. Depreciation expense - automobile	1,008	
	Cr. Accumulated depreciation - automobile		1,008
	($56,874 - $8,500) / 48 = $1,008 (rounded)		
c.	Dr. Interest expense [$46,874 × 0.3% = $141 (rounded)]	141	
	Cr. Notes payable		141
d.	Dr. Notes payable	1,050	
	Cr. Cash		1,050
e.	Dr. Interest expense	138	
	[($46,874 + $141 - $1,050) × 0.3% = $138 (rounded)]		
	Cr. Notes payable		138

P12-23. ***Suggested solution:***

Determining the effective interest rate for the period using a BAII PLUS financial calculator
- The net proceeds (PV) to Buy Low are $970,000
- N = 6 (3 × 2); PMT = $25,000 ($1,000,000 × 5% × 6/12)
- 6N, 970000 +/– PV, 1000000 FV, 25000 PMT, CPT I/Y I/Y = 3.0548% (rounded)

a. Effective period rate = 3.0548%

Small differences due to rounding

Straight-line method									**Effective interest method**				
Date	Interest expense		Interest paid		Discount amortized		Amortized cost		Date	Interest expense	Interest paid	Discount amortized	Amortized cost
Jan. 1, 2019							$970,000	(a)	Jan. 1, 2019				$970,000
June 30, 2019	$30,000	(b)	$25,000	(c)	$5,000	(d)	$975,000	(e)	June 30, 2019	$29,632	$25,000	$4,632	$974,632
Dec. 31, 2019	$30,000		$25,000		$5,000		$980,000		Dec. 31, 2019	$29,773	$25,000	$4,773	$979,405
June 30, 2020	$30,000		$25,000		$5,000		$985,000		June 30, 2020	$29,919	$25,000	$4,919	$984,323
Dec. 31, 2020	$30,000		$25,000		$5,000		$990,000		Dec. 31, 2020	$30,069	$25,000	$5,069	$989,393
June 30, 2021	$30,000		$25,000		$5,000		$995,000		June 30, 2021	$30,224	$25,000	$5,224	$994,616

Dec. 31, 2021	$30,000		$25,000		$5,000		$1,000,000		Dec. 31, 2021	$30,384	$25,000	$5,384	$1,000,000
	$180,000		$150,000		$30,000					$180,000	$150,000	$30,000	
(a) given													
(b) $25,000 + $5,000 = $30,000													
(c) $1,000,000 × 5%/2 = $25,000													
(d) $1,000,000 – $970,000 = $30,000; $30,000/6 = $5,000													
(e) $970,000 + $5,000 = $975,000													

b. Journal entry on issuance (Jan. 1, 2019) - both methods		
Dr. Cash	970,000	
Cr. Bonds payable		970,000
c. Journal entry on interest payment date (June 30, 2019) - straight-line		
Dr. Interest expense (from spreadsheet)	30,000	
Cr. Bonds payable		5,000
Cr. Cash		25,000
d. Journal entry on interest payment date (June 30, 2019) - effective interest		
Dr. Interest expense (from spreadsheet)	29,632	
Cr. Bonds payable		4,632
Cr. Cash		25,000
e. Journal entry on retirement of bonds (Dec. 31, 2021) - both methods		
Dr. Bonds payable	1,000,000	
Cr. Cash		1,000,000

f. The straight-line and effective interest methods are different approaches of allocating discounts and premiums to interest expense over the life of the bonds. The choice of methods does not affect a company's cash flow, as the coupon payment (the cash outflow) remains the same. Moreover, total interest expense over the life of the bond is the same. Initial interest expense will be higher under the straight-line method for bonds issued at a discount and lower for bonds issued at a premium. IFRS believes that the effective interest method is conceptually superior as a uniform interest rate is used to calculate interest expense over the life of the bond. It thus provides for better matching of expenses than does the straight-line method. The Accounting Standards for Private Enterprises permits the use of the straight-line method as it is easy to use and period results do not usually differ materially from those obtained under the effective interest method.

P12-24. ***Suggested solution:***

There are a number of ways to approach this question, but NPV (net present value) analysis is normally used. Adler's cash position has not changed—they raised $3,441,000 using this money to pay out the old bond issue.

The present value of the old bond issue is determined by the repurchase price – $3,441,000. This is confirmed by using a BAII PLUS financial calculator. 5N, 4000000 FV, 180000* PMT, 8 I/Y, CPT PV PV = 3,441,000 (rounded). The present value of the new bond issue is determined by the issue price – $3,441,000. This is confirmed by using a BAII PLUS financial calculator. 5N, 3441000 FV, 275280** PMT, 8 I/Y, CPT PV PV = 3,441,000.
*$4,000,000 × 4.5% = $180,000; **$3,441,000 × 8% = $275,280

The net cash inflow was $0, as 100% of the sale proceeds of the new issue were used to retire the old issue. This coupled with the fact that the present value of the old and new indebtedness is the same means that Adler is not any better off than previously. When taxation and transaction costs are considered, the company will be worse off.

P12-25. ***Suggested solution:***

a. Journal entry on issuance (March 1, 2018)		
Dr. Cash ($5,315,703 + $50,000)	5,365,703	
Cr. Bonds payable (given)		5,315,703
Cr. Interest expense ($5,000,000 × 6% × 2/12)		50,000
b. Journal entry on interest payment date (July 1, 2018)		
Dr. Interest expense ($74,420* + $50,000)	124,420	
Dr. Bonds payable ($150,000 – $124,420)	25,580	
Cr. Cash		150,000
*[$5,315,703 × (4.2%/2) × (4/6) = $74,420 (rounded)]		
c. Journal entry on reacquisition of the bonds (July 1, 2018)		
Dr. Loss on bond redemption ($5,400,000 – $5,290,123)	109,877	
Dr. Bonds payable ($5,315,703 – $25,580)	5,290,123	
Cr. Cash		5,400,000

P12-26. ***Suggested solution:***

a.				
The sales proceeds of the bonds is $10,000,000 × 103 = $10,300,000				
The premium to be amortized per period is ($10,300,000 - $10,000,000) / (3 × 2) = $50,000				
The interest paid per period is $10,000,000 x 5% / 2 = $250,000				
The interest expense per period is $250,000 - $50,000 = $200,000				
Date	Interest expense	Interest paid	Premium amortized	Amortized cost
01/01/2018				$10,300,000
06/30/2018	$200,000	$250,000	$50,000	$10,250,000
12/31/2018	$200,000	$250,000	$50,000	$10,200,000
06/30/2019	$200,000	$250,000	$50,000	$10,150,000
12/31/2019	$200,000	$250,000	$50,000	$10,100,000

06/30/2020	$200,000	$250,000	$50,000	$10,050,000
12/31/2020	$200,000	$250,000	$50,000	$10,000,000
	$1,200,000	$1,500,000	$300,000	

b. Journal entry on issuance (Jan. 1, 2018)		
Dr. Cash ($10,000,000 × 103)	10,300,000	
Cr. Bonds payable		10,300,000
b. Journal entry on interest payment date (June 30, 2018)		
Dr. Interest expense (from above)	200,000	
Dr. Bonds payable ($250,000 - $200,000)	50,000	
Cr. Cash ($10,000,000 × 5% / 2)		250,000
c. Journal entry at maturity (Jan. 1, 2021)		
Dr. Bonds payable	10,000,000	
Cr. Cash		10,000,000

P12-27. ***Suggested solution:***

a.

Date	Interest expense	Interest paid	Discount amortized	Amortized cost
07/01/2018				$7,887,020[a]
12/31/2018	$138,023[b]	$120,000[c]	$18,023[d]	$7,905,043[e]
06/30/2019	$138,338	$120,000	$18,338	$7,923,381
12/31/2019	$138,659	$120,000	$18,659	$7,942,040
06/30/2020	$138,986	$120,000	$18,986	$7,961,026
12/31/2020	$139,318	$120,000	$19,318	$7,980,344
06/30/2021	$139,656	$120,000	$19,656	$8,000,000
	$832,980	$720,000	$112,980	

[a] Given

[b] $7,887,020 × 3.5% / 2 = $138,023

[c] $8,000,000 × 3.0% / 2 = $120,000

[d] $138,023 - $120,000 = $18,023

[e] $7,887,020 + $18,023 = $7,905,043

b. Journal entry on issuance (July 1, 2018)		
Dr. Cash (given)	7,887,020	
Cr. Bonds payable		7,887,020
c. Journal entry on interest payment date (Dec. 31, 2019)		
Dr. Interest expense (from above)	138,659	
Cr. Bonds payable ($138,659 - $120,000)		18,659

Cr. Cash ($8,000,000 × 3% / 2)		120,000

d. Journal entry at maturity (Jul. 1, 2021)		
Dr. Bonds payable	8,000,000	
Cr. Cash		8,000,000

e. New bond issues are sold at the offering price in what is known as the primary market. This market is dominated by institutional investors; small investors are seldom able to purchase new bond issues at the offering price. Subsequent to issue, bonds trade in a decentralized, secondary, over-the-counter (OTC) market, rather than in a common location like the Toronto Stock Exchange.

P12-28. ***Suggested solution:***

a. Journal entry to recognize the issuance of the note payable (January 1, 2018)

Dr. Cash	144,000	
Cr. Note payable		144,000

€100,000 × C$1.44/€1.00 = C$144,000

b. Journal entry to revalue the obligation at period-end (December 31, 2018)

Dr. Foreign exchange loss	3,000	
Cr. Note payable		3,000

€100,000 × C$1.47/€1.00 = C$147,000; C$147,000 − C$144,000 = C$3,000 (a loss)

c. Journal entry to record the payment of interest (December 31, 2018)

Dr. Interest expense	7,250	
Dr. Foreign exchange loss	100	
Cr. Cash		7,350

€$100,000 × 5.0% = €$5,000 × C$1.47/€1.00 = C$7,350 (spot rate); €$5,000 × C$1.45/€1.00 = C$7,250 = (average rate); C$7,350 − C$7,250 = $100 (a loss)

d. Journal entry to revalue the obligation at period-end (December 31, 2019)

Dr. Note payable	5,000	
Cr. Foreign exchange gain		5,000

€$100,000 × C$1.42/€$1.00 = C$142,000; C$142,000 – (C$144,000 + C$3,000) = C$5,000 (a gain)

e. Journal entry to record the payment of interest (December 31, 2019)

Dr. Interest expense	7,150	
Cr. Foreign exchange gain		50
Cr. Cash		7,100

€$100,000 × 5.0% = €$5,000 × C$1.42/€$1.00 = C$7,100 (spot rate); €$7,100 × C$1.43/€$1.00 = C$7,150 (average rate); C$7,100 − C$7,150 = C$50 (a gain)

f. Journal entry to record the derecognition of the note (Dec. 31, 2019)

Dr. Note payable	142,000	
Cr. Cash		142,000

€$100,000 × C$1.42/€$1.00 = C$142,000; or C$144,000 + C$3,000 – C$5,000 = C$142,000

P12-29. ***Suggested solution:***

a.

(i). Journal entry on issuance (July 1, 2018)

Dr. Cash (Sales proceeds)	5,040,000	
Cr. Bonds payable ($5,040,000 – $40,000)		5,000,000
Cr. Cash (Sales commission)		40,000

(ii). Journal entry on reacquisition of the bonds (July 31, 2021)

Dr. Interest expense ($3,000,000 × 6% × 1/12)	15,000	
Dr. Bonds payable	3,000,000	
Dr. Loss on redemption of bonds ($3,075,000 – $3,000,000 – $15,000)	60,000	
Cr. Cash ($3,000,000 × 102% + $15,000)		3,075,000

(iii). Journal entry on interest payment date (Dec. 31, 2021)

Dr. Interest expense ($2,000,000 × 6% × 4/12)	40,000	
Dr. Accrued interest payable ($2,000,000 × 6% × 2/12)*	20,000	
Cr. Cash ($2,000,000 × 6% × 6/12)		60,000

* Inuvialuit does not use reversing entries

(iv). Journal entry on retirement of the bonds (March 31, 2022)

Dr. Bonds payable	2,000,000	
Dr. Interest expense ($2,000,000 × 6% × 3/12)	30,000	
Cr. Cash		1,980,000
Cr. Gain on retirement of bonds ($2,000,000 + $30,000 – $1,980,000)		50,000

b. The most likely reason why the company was able to repurchase its bonds at a discount on March 31, 2022 is that the market interest rate for similar bonds had increased and was then greater than the 6% coupon rate on Inuvialuit bonds. The decline in the market price of the company's bonds may have also been attributable to a perceived increase in the probability of default by the market and/or one or more of the debt rating agencies downgrading the rating on the bond.

P12-30. ***Suggested solution:***

Using a BAII PLUS financial calculator	
Situation 1	12N, 6I/Y, 10000000 FV, 700000 PMT, CPT PV PV = –10,838,384 (rounded)
Situation 2	12N, 12I/Y, 20000000 FV, 2000000 PMT, CPT PV PV = –17,522,250 (rounded)
Situation 3	8N, 14I/Y, 40000000 FV, 4800000 PMT, CPT PV PV = –36,288,909 (rounded)

a. Journal entry on issuance (Jan. 1, 2018)

Situation 1	Dr. Cash (Sales proceeds)	10,838,384	
	Cr. Bonds payable		10,838,384
Situation 2	Dr. Cash (Sales proceeds)	17,522,250	
	Cr. Bonds payable		17,522,250
Situation 3	Dr. Cash (Sales proceeds)	36,288,909	
	Cr. Bonds payable		36,288,909

b. Journal entry at year-end (Dec. 31, 2018)

Situation 1	Dr. Interest expense	647,321	
	Dr. Bonds payable	52,679	
	Cr. Cash		700,000

1. Calculate the outstanding balance at the beginning of period 2: 11N, 6I/Y, 10000000 FV, 700000 PMT, CPT PV PV = –10,788,687 (rounded)
2. Use the balance to determine interest expense: 10,788,687 × 12% / 2 = $647,321

Situation 2	Dr. Interest expense	2,102,670	
	Cr. Bonds payable		102,670
	Cr. Cash		2,000,000
	$17,522,250 × 12% = $2,102,670		
Situation 3	Dr. Interest expense	5,080,447	
	Cr. Bonds payable		280,447
	Cr. Cash		4,800,000
	$36,288,909 × 14% = $5,080,447		

c. Journal entry on retirement (Jan. 1, 2022)

Situation 3	Dr. Bonds payable*	37,669,030	
	Dr. Loss on retirement	2,330,970	
	Cr. Cash		40,000,000

*Calculate the outstanding balance at the beginning of period 5: 4N, 14I/Y, 40000000 FV, 4800000 PMT, CPT PV PV = –37,669,030 (rounded)

P12-31. ***Suggested solution:***

Determining the effective interest rate for the period using a BAII PLUS financial calculator

- The net proceeds (PV) are $9,990,000 ($10,500,000 – $400,000 – $200,000); N = 12 (6 × 2); PMT = $200,000 ($10,000,000 × 4% × 6/12)
- 12N, 9900000 +/– PV, 10000000 FV, 200000 PMT, CPT I/Y I/Y = 2.0951% (rounded)

Spreadsheet

Effective period rate		2.0951%						
Small differences due to rounding								
Date	Interest expense		Interest paid		Discount amortized		Amortized cost	
Jan. 1, 2017							$9,900,000	(a)
June 30, 2017	$207,416		$200,000	(b)	$7,416	(c)	9,907,416	(d)
Dec. 31, 2017	207,572		200,000		7,572		9,914,988	
June 30, 2018	207,730		200,000		7,730		9,922,718	
Dec. 31, 2018	207,892		200,000		7,892		9,930,610	
June 30, 2019	208,057		200,000		8,057		9,938,668	
Dec. 31, 2019	208,226		200,000		8,226		9,946,894	
Jan. 1, 2020	Redeem and derecognize 40% of the outstanding bonds						–3,978,758	
							$5,968,136	
June 30, 2020	125,039		120,000		5,039		5,973,175	
Dec. 31, 2020	125,145		120,000		5,145		5,978,320	
June 30, 2021	125,253		120,000		5,253		5,983,573	
Dec. 31, 2021	125,363		120,000		5,363		5,988,935	
June 30, 2022	125,475		120,000		5,475		5,994,410	
Dec. 31, 2022	125,590		120,000		5,590		6,000,000	

(a) The net sale proceeds of the bonds ($10,500,000 – $400,000 – $200,000 = $9,900,000)

(b) $10,000,000 × 4%/2 = $200,000

(c) $207,416 – $200,000 = $7,416

(d) $9,900,000 + $7,416 = $9,907,416

a. Journal entry on issuance (Jan. 1, 2017)		
Dr. Cash (Sales proceeds – transaction costs)	9,900,000	
Cr. Bonds payable ($10,500,000 – $400,000 – $200,000)		9,900,000
b. Journal entry on interest payment date (Dec. 31, 2019)		
Dr. Interest expense (from spreadsheet)	208,226	
Cr. Cash		200,000
Cr. Bonds payable		8,226
c. Journal entry on reacquisition of the bonds (Jan. 1, 2020)		
Dr. Loss on bond redemption ($4,040,000 – $3,978,758)	61,242	
Dr. Bonds payable (from spreadsheet)	3,978,758	
Cr. Cash ($4,000,000 × 101%)		4,040,000

d. Journal entry on retirement of the bonds (Dec. 31, 2022)		
Dr. Bonds payable	6,000,000	
Cr. Cash		6,000,000

P12-32. ***Suggested solution:***

a. Determining the interest rate for the period using a BAII PLUS financial calculator

- The net proceeds (PV) to Candoit are $9,772,469 ($9,972,469– $200,000); N = 10 (5 × 2); PMT = $150,000 ($10,000,000 × 3% × 6/12)
- 10 N, 9772469 +/– PV, 10000000 FV, 150000 PMT, CPT I/Y I/Y = 1.75%
- Nominal annual interest rate = 3.5% (2 × 1.75%)
- Effective annual interest rate = 3.5306% (rounded) ($(1 + .0175)^2 - 1$))

b. Using a BAII PLUS financial calculator

Net book value at March 16, 2020:

- When the bonds were issued on March 15, 2018, they were five-year bonds (10 period bonds). It is now two years later, so three years (six periods) remain.
- 6N, 1.75 I/Y, 10000000 FV, 150000 PMT, CPT PV PV = –9,858,775 (rounded)

Net book value at September 16, 2020:

- When the bonds were issued on March 15, 2018, they were five-year bonds (10 period bonds). It is now 2½ years later, so 2½ years (five periods) remain.
- 5N, 1.75 I/Y, 10000000 FV, 150000 PMT, CPT PV PV = –9,881,304 (rounded)

Spreadsheet

Small differences due to rounding

Date	Interest expense		Interest paid		Discount amortized		Amortized cost	
Mar. 15, 2018							$9,772,469	(a)
Sept. 15, 2018	$171,018	(b)	$150,000	(c)	$21,018	(d)	9,793,487	(e)
Mar. 15, 2019	171,386		150,000		21,386		9,814,874	
Sept. 15, 2019	171,760		150,000		21,760		9,836,634	
Mar. 15, 2020	172,141		150,000		22,141		9,858,775	(f)
Sept. 15, 2020	172,529		150,000		22,529		9,881,304	(g)
Mar. 15, 2021	172,923		150,000		22,923		9,904,226	
Sept. 15, 2021	173,324		150,000		23,324		9,927,550	
Mar. 15, 2022	173,732		150,000		23,732		9,951,283	
Sept. 15, 2022	174,147		150,000		24,147		9,975,430	
Mar. 15, 2023	174,570		150,000		24,570		10,000,000	

(a) net proceeds from issue – $9,972,469 – $200,000 = $9,772,469

(b) $9,772,469 × 1.75% = $171,018

(c) $10,000,000 × 3.0%/2 = $150,000

(d) $171,018 – $150,000 = $21,018

(e) $9,772,469 + $21,018 = $9,793,487
(f) the outstanding balance as at March 15, 2020 equals that determined using the financial calculator approach
(g) the outstanding balance as at Sept. 15, 2020 equals that determined using the financial calculator approach

c. The market rate of interest was lower on the date of repurchase than on the date of issue. When the bonds were issued, they were sold at a discount as the market rate of interest was higher than the coupon rate. At date of repurchase, they sold at par implying that the market rate of interest equalled the coupon rate. Hence, the market rate has declined.
d. The repurchase did not result in an economic gain for either Candoit or the investor. The cash paid to redeem the bond was equal to the present value of the future cash flow streams discounted at the market rate of interest on the date of redemption. More simply, there was not an economic gain or loss because the company reacquired the bonds at their fair market value. The loss on redemption suffered by Candoit (and the offsetting gain realized by the investor) were due to the change in the market value when interest rates declined.

P12-33. ***Suggested solution:***

a. The fair value of the bond at time of issue is determined using discounted cash flow analysis. The book value of the bond at the time of repurchase is determined using discounted cash flow analysis using the original effective rate of interest to discount the remaining cash flow stream. As at date of redemption, there are 5 years (10 periods) left to maturity.
Using a BAII PLUS financial calculator (issue) ▪ 24N (12 × 2), 3 I/Y (6%/2), 140,000 PMT ($4,000,000 × 7%/2); 4000000 FV, CPT PV PV = –4,338,711 (rounded)
Issue Dr. Cash 4,338,711 Cr. Bonds payable 4,338,711
Using a BAII PLUS financial calculator (repurchase – book value) ▪ 10 N (5 × 2), 3 I/Y (6%/2), 140,000 PMT ($4,000,000 × 7%/2); 4000000 FV, CPT PV PV = –4,170,604 (rounded)
Redemption Dr. Bonds payable 4,170,604 Cr. Gain on redemption of bonds ($4,170,604 – 4,080,000) 90,604 Cr. Cash ($4,000,000 × 102) 4,080,000
b. The fair value of the bond at time of issue is determined using discounted cash flow analysis. The fair market value of the bond at the time of repurchase is determined using discounted cash flow analysis using the current effective rate of interest (6%/2 = 3%) to discount the remaining cash flow stream. As at date of redemption, there are 4½ years (nine periods) left to maturity.

The book value of the bond at the time of repurchase is determined using discounted cash flow analysis using the original effective rate of interest to discount the remaining cash flow stream. As at date of redemption, there are 4½ years (nine periods) left to maturity.

Using a BAII PLUS financial calculator (issue)
- 16 N (8 × 2), 3.25 I/Y (6.5%/2), 150000 PMT ($6,000,000 × 5%/2), 6000000 FV, CPT PV
  PV = –5,445,404 (rounded)

Issue

Dr. Cash	5,445,404	
Cr. Bonds payable		5,445,404

Using a BAII PLUS financial calculator (redemption)
market value:
- 9 N (4½ × 2), 3 I/Y (6/2), 150000 PMT, 6000000 FV, CPT PV PV = –5,766,417 (rounded)

book value:
- 9 N (4½ × 2), 3.25 I/Y (6.5/2), 150000 PMT, 6000000 FV, CPT PV
  PV = –5,653,674 (rounded)

Repurchase

Dr. Bonds payable (book value)	5,653,674	
Dr. Loss on repurchase of bonds ($5,766,417 –$5,653,674)	112,743	
Cr. Cash (market value)		5,766,417

P12-34. ***Suggested solution:***

a. The fair value of the bond at time of issue is determined using discounted cash flow analysis.

The book value of the bond at the time of repurchase is determined using discounted cash flow analysis using the original effective rate of interest to discount the remaining cash flow stream. As at date of redemption, there are 3 years (6 periods) left to maturity.

Using a BAII PLUS financial calculator (issue)
- 16N (8 × 2), 3 I/Y (6%/2), 150,000 PMT ($6,000,000 × 5%/2); 6000000 FV, CPT PV
  PV = –5,623,167 (rounded)

Issue

Dr. Cash	5,623,167	
Cr. Bonds payable		5,623,167

Using a BAII PLUS financial calculator (repurchase – book value)
- 6N (3 × 2), 3 I/Y (6%/2), 150,000 PMT ($6,000,000 × 5%/2); 6000000 FV, CPT PV PV = –5,837,484 (rounded) 5,837,484 x 40% = 2,334,994

Redemption

Dr. Bonds payable	2,334,994	

Dr. Loss on redemption of bonds ($2,424,000 - 2,334,994)	89.006	
Cr. Cash ($2,400,000 × 101)		2,424,000

b. The fair value of the bond at time of issue is determined using discounted cash flow analysis.

The fair market value of the bond at the time of repurchase is determined using discounted cash flow analysis using the current effective rate of interest (7%/2 = 3.5%) to discount the remaining cash flow stream. As at date of redemption, there are 2½ years (five periods) left to maturity.

The book value of the bond at the time of repurchase is determined using discounted cash flow analysis using the original effective rate of interest to discount the remaining cash flow stream. As at date of redemption, there are 2½ years (five periods) left to maturity.

Using a BAII PLUS financial calculator (issue)

- 12 N (6 × 2), 2.75 I/Y (5.5%/2), 150000 PMT ($5,000,000 × 6%/2), 5000000 FV, CPT PV PV = –5,126,303 (rounded)

Issue

Dr. Cash	5,126,303	
Cr. Bonds payable		5,126,303

Using a BAII PLUS financial calculator (redemption)
market value:

- 5 N (2½ × 2), 3.5 I/Y (7%/2), 150000 PMT ($5,000,000 × 6%/2), 6000000 FV, CPT PV PV = –4,887,124 (rounded)

book value:

- 5 N (2½ × 2), 2,75 I/Y (5.5%/2), 150000 PMT ($5,000,000 × 6%/2), 6000000 FV, CPT PV PV = –5,057,657 (rounded)

Repurchase

Dr. Bonds payable (book value)	5,057,657	
Cr. Gain on repurchase of bonds ($5,057,657 –$4,887,124)		170,533
Cr. Cash (market value)		4,887,124

P12-35. ***Suggested solution:***

Part I

a. Journal entry to recognize the issuance of the bonds (January 1, 2018)

Dr. Cash	5,500,000	
Cr. Bonds payable		5,500,000

US$5,000,000 × C$1.10/US$1.00 = C$5,500,000

b. Journal entry to revalue the obligation at period-end (December 31, 2018)

Dr. Bonds payable	100,000	
Cr. Foreign exchange gain		100,000

US$5,000,000 × C$1.08/US$1.00 = C$5,400,000; C$5,400,000 – C$5,500,000) = C$100,000 (a gain)

c. Journal entry to record the payment of interest (December 31, 2018)

Dr. Interest expense	327,000	
Cr. Foreign exchange gain		3.000
Cr. Cash		324,000

US$5,000,000 × 6.0% = US$300,000 × C$1.08/US$1.00 = C$324,000(spot rate); US$300,000 × C$1.09/US$1.00 = C$327,000 (average rate); C$324,000 − C$327,000 = $3,000 (a gain)

d. Journal entry to revalue the obligation at period-end (December 31, 2022)

Dr. Bonds payable	100,000	
Cr. Foreign exchange gain		100,000

(US$5,000,000 × C$1.07/US$1.00) – (US$5,000,000 × C$1.09/US$1.00) = C$5,350,000 - $5,450,000 = C$100,000 (a gain)

e. Journal entry to record the payment of interest (December 31, 2022)

Dr. Interest expense	324,000	
Cr. Foreign exchange gain		3,000
Cr. Cash		321,000

US$5,000,000 × 6.0% = US$300,000 × C$1.07/US$1.00 = C$321,000 (spot rate); US$300,000 × C$1.08/US$1.00 = C$324,000 (average rate); C$321,000 − C$324,000 = C$3,000 (a gain)

f. Journal entry to record the derecognition of the bond (Dec. 31, 2022)

Dr. Bonds payable	5,350,000	
Cr. Cash		5,350,000

US$5,000,000 × C$1.07/US$1.00 = C$5,350,000

Part II

The total foreign exchange gain or loss related to borrowing in US dollars can be determined as follows:

Due to change in exchange rates between recognition and derecognition dates	
Bond proceeds in Canadian dollars (US$5,000,000 × C$1.10/US$1.00)	C$5,500,000
Bond payout amount in Canadian dollars (US$5,000,000 × C$1.07/US$1.00)	C$5,350,000
Gain (US$5,000,000 × (C$110 - C$1.07)/US$1.00)	C$ 150,000
Due to the purchase of US dollars at exchange rates different from those expensed	
Interest expense in Canadian dollars (from below)	C$1,626,000
Interest paid in Canadian dollars (from below)	C$1,623,000
Gain in Canadian dollars	C$ 3,000
Total foreign exchange gain reported due to fluctuations in the exchange rate	
Due to change in rates between recognition and derecognition	C$150,000
Due to purchase of US dollars at exchange rates different from those expensed	C$ 3,000

Total gain reported in Canadian dollars over the life of the bond	C$153,000

Interest – US$*	Spot rate	Interest paid – C$	Average rate	Interest expense - C$
US$300,000	Dec. 31, 2018 - C$1.08	C$324,000	2018 - C$1.09	C$327,000
US$300,000	Dec. 31, 2019 - C$1.06	C$318,000	2019 - C$1.07	C$321,000
US$300,000	Dec. 31, 2020 - C$1.11	C$333,000	2020 - C$1.08	C$324,000
US$300,000	Dec. 31, 2021 - C$1.09	C$327,000	2021 - C$1.10	C$330,000
US$300,000	Dec. 31, 2022 - C$1.07	C$321,000	2022 - C$1.08	C$324,000
Total		**C$1,623,000**		**C$1,626,000**

* US$5,000,000 × 6.0% = US$300,000

P12-36. ***Suggested solution:***

a. Spreadsheet

Effective period rate	7.2000%

Small differences due to rounding

Date	Interest expense		Interest paid		Discount amortized		Amortized cost	
Dec. 1, 2016							$2,838,944	(a)
June 30, 2021	$194,236	(b)	$180,000	(c)	$14,236	(d)	2,853,180	(e)
June 30, 2022	205,429		180,000		25,429		2,878,609	
June 30, 2023	207,260		180,000		27,260		2,905,868	
July 1, 2023	Book value of bonds purchased ($2,905,868/3)						$968,623	(f)
July 1, 2023							1,937,245	
June 30, 2024	139,482		120,000	(g)	19,482		$1,956,727	(h)

(a) The sale price of the bonds

(b) ($180,000 × 5/12 = $75,000); [($2,838,944 × 7.20% × 7/12) + $75,000 = $194,236]

(c) $3,000,000 × 6% = $180,000

(d) $194,236 – $180,000 = $14,236

(e) $2,838,944 + $14,236 = $2,853,180

(f) $1,000,000 of the $3,000,000 in bonds are redeemed so 1/3 of the liability is removed from the books

(g) $180,000 × 2/3 = $120,00 or $2,000,000 × 6% = $120,000

(h) this is the amount to be derecognized

b. Journal entry on issuance (Dec. 1, 2020)

Dr. Cash ($2,838,944 + $75,000)	2,913,944	
Cr. Bonds payable (given)		2,838,944
Cr. Interest expense ($3,000,000 × 6% × 5/12)		75,000

c. Journal entry on interest payment date (June 30, 2021)

Dr. Interest expense (from spreadsheet)	194,236	
Cr. Bonds payable		14,236
Cr. Cash		180,000
d. Journal entry on interest payment date (June 30, 2023)		
Dr. Interest expense (from spreadsheet)	207,260	
Cr. Bonds payable		27,260
Cr. Cash		180,000
e. Journal entry on reacquisition of the bonds (July 1, 2023)		
Dr. Bonds payable (from spreadsheet)	968,623	
Cr. Cash (given)		950,000
Cr. Gain on bond redemption ($968,623 – $950,000)		18,623
f. Journal entry on interest payment date (June 30, 2024)		
Dr. Interest expense (from spreadsheet)	139,482	
Cr. Bonds payable		19,482
Cr. Cash		120,000
g. Journal entry on reacquisition of the bonds (July 1, 2024)		
Dr. Loss on bond redemption ($2,040,000 – $1,956,727)	83,273	
Dr. Bonds payable (from spreadsheet)	1,956,727	
Cr. Cash ($2,000,000 × 102%)		2,040,000

P12-37. ***Suggested solution:***

a(i). The fair value of the bond is determined using discounted cash flow analysis where:
- FV = $5,000,000; N = 120 (10 × 12); I/Y = 0.3% (3.6%/12):
- PV = $5,000,000 / 1.003^{120} = $3,490,262.

Using a BAII PLUS financial calculator
- 120 N, 0.3 I/Y, 5000000 FV, CPT PV PV = –3,490,262 (rounded)

Issue

Dr. Cash	3,490,262	
Cr. Bonds payable		3,490,262

The fair value of the bond (the repurchase price) is determined using the market rate of interest to discount the future value:
- FV = $2,000,000; N = 54 [(10 × 12) – (5.5 × 12)]; I/Y = 0.4% (4.8%/12)

The net book value of the bond is determined using the original effective rate interest to discount the future value:
- FV = $2,000,000; N = 54 [(10 × 12) – (5.5 × 12)]; I/Y = 0.3% (3.6%/12)
- Fair value = $2,000,000/$1.004^{54}$ = $1,612,165

- Book value = $\$2{,}000{,}000/1.003^{54} = \$1{,}701{,}295$

Using a BAII PLUS financial calculator
- 54 N, 0.4 I/Y, 2000000 FV, CPT PV PV = –1,612,165 (rounded) is the fair value
- 54 N, 0.3 I/Y, 2000000 FV, CPT PV PV = –1,701,295 (rounded) is the book value

Repurchase

Dr. Bonds payable (from above)	1,701,295	
Cr. Gain on repurchase of bonds ($1,701,295 – $1,612,165)		89,130
Cr. Cash (from above)		1,612,165

a(ii).

Issue

Dr. Cash ($2,000,000 + $10,000)	2,010,000	
Cr. Interest expense ($2,000,000 × 6%/12)		10,000
Cr. Bonds payable		2,000,000

Interest payment

Dr. Interest expense	120,000	
Cr. Cash ($2,000,000 × 6%)		120,000

a(iii). The fair value of the bond (sales price) is determined using discounted cash flow analysis:
- N = 6 (3 × 2); PMT = $75,000 ($3,000,000 × 5% × 6/12); I/Y = 2.25% (4.5%/2)

$$PVFA(r,t) = \left(\frac{1}{r} - \frac{1}{r(1+r)^t}\right) = \left(\frac{1}{.0225} - \frac{1}{.0225(1+.0225)^6}\right) = 5.5545$$

Value of principal	= $3,000,000 / 1.0225^6	$2,625,073
Value of coupons	= $75,000 × PVFA(2.25%, 6) = $75,000 × 5.5545	416,588
Total		$3,041,661

Using a BAII PLUS financial calculator
- 6N, 2.25I/Y, 3000000 FV, 75000 PMT, CPT PV PV = –3,041,659 (rounded)

Dr. Cash	$3,041,659	
Cr. Bonds payable		$3,041,659

b.

Spreadsheet

Small differences due to rounding

Date	Interest expense		Interest paid		Premium amortized		Amortized cost	
Jan. 1, 2020							$3,041,659	(a)
June 30, 2020	$68,437	(b)	$75,000	(c)	$6,563	(d)	3,035,096	(e)

Dec. 31, 2020	68,290		75,000		6,710		3,028,386	
June 30, 2021	68,139		75,000		6,861		3,021,525	
Dec. 31, 2021	67,984		75,000		7,016		3,014,509	
June 30, 2022	67,826		75,000		7,174		3,007,335	
Dec. 31, 2022	67,665		75,000		7,335		3,000,000	
(a) issue price								
(b) $3,041,659 × 2.25% = $68,437								
(c) $3,000,000 × 5%/2 = $75,000								
(d) $75,000 – $68,437 = $6,563								
(e) $3,041,659 – $6,563 = $3,035,096								

P12-38. ***Suggested solution:***

a(i). The fair value of the bond is determined using discounted cash flow analysis where:
- FV = $7,000,000; N = 96 (8 × 12); I/Y = 0.4% (4.8%/12):
- PV = $7,000,000 / 1.004^{96} = 4,771,573

Using a BAII PLUS financial calculator
- 96 N, 0.4 I/Y, 7000000 FV, CPT PV PV = –4,771,573 (rounded)

Issue

Dr. Cash	4,771,573	
Cr. Bonds payable		4,771,573

The fair value of the bond (the repurchase price) is determined using the market rate of interest to discount the future value:
- FV = $3,000,000; N = 42 [(8 × 12) – (4.5 × 12)]; I/Y = 0.3% (3.6%/12)

The net book value of the bond is determined using the original effective rate interest to discount the future value:
- FV = $3,000,000; N = 42 [(8 × 12) – (4.5 × 12)]; I/Y = 0.4% (4.8%/12)
- Fair value = $3,000,000/$1.003^{42}$ = $2,645,343
- Book value = $3,000,000/$1.004^{42}$ = $2,536,911

Using a BAII PLUS financial calculator
- 42 N, 0.3 I/Y, 3000000 FV, CPT PV PV = –2,645,343 (rounded) is the fair value
- 42 N, 0.4 I/Y, 3000000 FV, CPT PV PV = – 2,536,911 (rounded) is the book value

Repurchase

Dr. Bonds payable (from above)	2,536,911	
Dr. Loss on repurchase of bonds ($2,645,343 – $2,536,911)	108,432	
Cr. Cash (from above)		2,645,343

a(ii).

Issue

Dr. Cash ($4,000,000 + $20,000)	4,020,000	
Cr. Interest expense ($4,000,000 × 3% × 2/12)		20,000
Cr. Bonds payable		4,000,000

Interest payment

Dr. Interest expense	120,000	
Cr. Cash ($4,000,000 × 3%)		120,000

a(iii). The fair value of the bond (sales price) is determined using discounted cash flow analysis:

- N = 6 (3 × 2); PMT = $75,000 ($3,000,000 × 5% × 6/12); I/Y = 2.75% (5.5%/2)

$$PVFA(r,t) = \left(\frac{1}{r} - \frac{1}{r(1+r)^t}\right) = \left(\frac{1}{.0275} - \frac{1}{.0275(1+.0275)^6}\right) = 5.4624$$

Value of principal	= $3,000,000 / 1.0275^6	$2,549,355
Value of coupons	= $75,000 × PVFA(2.75%, 6) = $75,000 × 5.4624	409,680
Total		$2,959,035

Using a BAII PLUS financial calculator

- 6N, 2.75I/Y, 3000000 FV, 75000 PMT, CPT PV PV = –2,959,032 (rounded)

Dr. Cash	$2,959,032	
Cr. Bonds payable		$2,959,032

b.

Spreadsheet

Small differences due to rounding

Date	Interest expense		Interest paid		Premium amortized		Amortized cost	
Jan. 1, 2019							$2,959,032	(a)
June 30, 2019	$81,373	(b)	$75,000	(c)	$6,373	(d)	2,965,406	(e)
Dec. 31, 2019	$81,549		75,000		$6,549		2,971,954	
June 30, 2020	$81,729		75,000		$6,729		2,978,683	
Dec. 31, 2020	$81,914		75,000		$6,914		2,985,597	
June 30, 2021	$82,104		75,000		$7,104		2,992,701	
Dec. 31, 2021	$82,299		75,000		$7,299		3,000,000	

(a) issue price

(b) $2,959,032 × 2.75% = $81,373

(c) $3,000,000 × 5%/2 = $75,000

(d) $81,373 – $75,000 = $6,373

(e) $2,959,032 + $6,373 = $2,965,406

P12-39. ***Suggested solution:***

a. Determining the interest rate for the period using a BAII PLUS financial calculator

- The net proceeds (PV) to Illustrious are $8,148,101 ($8,298,101– $150,000); N = 8 (4 × 2); PMT = $160,000 ($8,000,000 × 4% × 6/12)
- 8 N, 8148101 +/– PV, 8000000 FV, 160000 PMT, CPT I/Y I/Y = 1.75%
- Nominal annual interest rate = 3.5% (2 × 1.75%)
- Effective annual interest rate = 3.5306% (rounded) $((1 + .0175)^2 - 1)$

b. Using a BAII PLUS financial calculator

Net book value at October 1, 2019:

- When the bonds were issued on April 1, 2019, they were four-year bonds (8 period bonds). It is now ½ year later, so 3½ years (seven periods) remain.
- 7N, 1.75 I/Y, 8000000 FV, 160000 PMT, CPT PV PV = –8,130,693(rounded)

Net book value at April 1, 2020:

- When the bonds were issued on April 15, 2019, they were four-year bonds (8 period bonds). It is now 1 year later, so 3 years (six periods) remain.
- 6N, 1.75 I/Y, 8000000 FV, 160000 PMT, CPT PV PV = –8,112,980 (rounded)

Spreadsheet

Small differences due to rounding

Date	Interest expense		Interest paid		Premium amortized		Amortized cost	
Apr. 1, 2019							$8,148,101	(a)
Sept. 30, 2019	$142,592	(b)	$160,000	(c)	$17,408	(d)	8,130,693	(e) (f)
Mar. 31, 2020	142,287		160,000		17,713		8,112,980	(g)
Sept. 30, 2020	141,977		160,000		18,023		8,094,957	
Mar. 31, 2021	141,662		160,000		18,338		8,076,619	
Sept. 30, 2021	141,341		160,000		18,659		8,057,960	
Mar. 31, 2022	141,014		160,000		18,986		8,038,974	
Sept. 30, 2022	140,682		160,000		19,318		8,019,656	
Mar. 31, 2023	140,344		160,000		19,656		8,000,000	

(a) net proceeds from issue – $8,298,101 – $150,000 = $8,148,101

(b) $8,148,101 × 1.75% = $142,592

(c) $8,000,000 × 4.0%/2 = $160,000

(d) $160,000 – $142,592 = $17,408

(e) $8,148,101 - $17,408 = $8,130,693

(f) the outstanding balance as at October 1, 2019 equals that determined using the financial calculator approach

(g) the outstanding balance as at April 1, 2020 equals that determined using the financial calculator approach

c. Recording the issuance of bonds at amortized cost		
Dr. Cash ($8,298,101– $150,000)	8,148,101	
Cr. Bonds payable		8,148,101
d. Recording the partial redemption of bonds		
Dr. Bonds payable	3,021,735	
($8,057,960 from above × $3 million / $8 million)		
Cr. Gain on redemption of bonds		21,735
($3,021,735 - $3,000,000)		
Cr. Cash ($3,000,000 bought at face value)		3,000,000
e. Recording the issuance of bonds designated as at fair value through profit or loss		
Dr. Cash ($8,298,101– $150,000)	8,148,101	
Dr. Bond issue expense	150,000	
Cr. Bonds payable		8,298,101

P12-40. ***Suggested solution:***

a. Offsetting is the practice of showing the net amount of related assets and liabilities on the balance sheet, rather than showing the components separately. Offsetting is allowed only when the entity has both a legally enforceable right to offset the asset and liability and intends to settle on a net basis. The principal benefit to offsetting is that it may improve key financial ratios making it easier to meet restrictive covenants. Moreover, it may free up borrowing capacity.
b. In-substance defeasance is an arrangement where funds sufficient to satisfy a liability are placed in trust with a third party to pay directly to the creditor at maturity. Defeasance arrangements qualify for offsetting only if the creditor formally confirms that the entity is no longer liable for the indebtedness.

P12-41. ***Suggested solution:***

a. Journal entry for open market purchase and retirement (Apr. 1, 2017)		
Dr. Bonds payable	1,000,000	
Dr. Interest expense ($1,000,000 × 6% × 3/12)	15,000	
Cr. Cash		984,736
Cr. Gain on bond redemption		30,264
($1,000,000 + $15,000 – $984,736)		
b. Journal entry for calling the bonds (Aug. 1, 2018)		
Dr. Bonds payable	500,000	
Dr. Interest expense ($500,000 × 6% × 1/12)	2,500	
Dr. Loss on bond redemption ($507,500 – $500,000 – $2,500)	5,000	
Cr. Cash ($500,000 × 101% + $2,500)		507,500

c. Journal entry on retirement of the bonds (Dec. 31, 2020)		
Dr. Bonds payable ($5,000,000 – $1,000,000 – $500,000)	3,500,000	
Cr. Cash		3,500,000

P12-42. ***Suggested solution:***

a. The present value fair value of the site restoration obligations is determined using discounted cash flow analysis.

Value of principal = $15,000,000 / 1.06^{20} $4,677,071

Using a BAII PLUS financial calculator

- 20 N, 6 I/Y, 15000000 FV, CPT PV PV = –4,677,071 (rounded)

a. Journal entries for the site restoration obligation under IFRS		
Dr. Land	4,677,071	
Cr. Site restoration obligation		4,677,071
b. Journal entries for the site restoration obligation under ASPE		
Dr. Land	4,677,071	
Cr. Asset retirement obligation		4,677,071

P12-43. ***Suggested solution:***

a. The present value fair value of the site restoration obligations is determined using discounted cash flow analysis.

Value of principal = $3,000,000 / 1.04^{8} $2,192,071

Using a BAII PLUS financial calculator

- 8 N, 4 I/Y, 3000000 FV, CPT PV PV = –2,192,071 (rounded)

a. Journal entries for the site restoration obligation under IFRS		
Dr. Oil platform	2,192,071	
Cr. Site restoration obligation		2,192,071
b. Journal entries for the site restoration obligation under ASPE		
Dr. Oil platform	2,192,071	
Cr. Asset retirement obligation		2,192,071

P12-44. ***Suggested solution:***

At the end of year five, the remaining life of the obligation is three years (8 – 5 = 3). The present fair value of the site restoration obligations valued at the original interest rate of 4% is determined using discounted cash flow analysis.

Value of principal = $3,000,000 / 1.04^3 $2,666,989

Using a BAII PLUS financial calculator
- 3 N, 4 I/Y, 3000000 FV, CPT PV PV = –2,666,989 (rounded)

At the beginning of year six, the present fair value of the site restoration obligations valued at the revised interest rate of 5% is determined using discounted cash flow analysis.

Value of principal = $3,000,000 / 1.05^3 $2,591,513

Using a BAII PLUS financial calculator
- 3 N, 5 I/Y, 3000000 FV, CPT PV PV = –2,591,513 (rounded)

a. Journal entry to record the change in the liability amount

Dr. Site restoration obligation	75,476	
Cr. Oil platform		75,476

$2,666,989 - $2,591,513 = $75,476

The cost of the asset was originally determined to be $2,192,071 depreciated on a straight-line basis over eight years. $2,192,071 / 8 years = $274,009 per year. Accumulated depreciation = $274,009 × 5 = $1,370,045. The net book value of the asset at the end of year five was $2,192,071 - $1,370,045 = $822,026. The revised net book value of the asset at the beginning of year six is $822,026 - $75,476 = $746,550. This amount has to be depreciated over the three remaining year $746,550 / 3 = $248,850. Thus the revised amount of depreciation pertaining to the asset related to the site restoration obligation is $248,850.

b. Journal entry to record the depreciation on the asset related to the sire restoration costs

Dr. Depreciation expense oil platform (from above)	248,850	
Cr. Accumulated depreciation oil platform		248,850

P12-45. ***Suggested solution:***

a. The present value fair value of the site restoration obligations is determined using discounted cash flow analysis.

Value of principal = $5,000,000 / 1.05^{10} $3,069,566

Using a BAII PLUS financial calculator
- 10 N, 5 I/Y, 5000000 FV, CPT PV PV = –3,069,566 (rounded)

a. Journal entries for the site restoration obligation and construction costs (December 31, 2017)

Dr. Mine asset	3,069,566	
Cr. Site restoration obligation		3,069,566

Dr. Mine asset	20,000,000	
Cr. Cash		20,000,000

b. Journal entries at year end (Dec. 31, 2018)		
Dr. Interest expense ($3,069,566 × 5%)	153,478	
Cr. Site restoration obligation		153,478
Dr. Depreciation expense mine asset	1,730,217	
Cr. Accumulated depreciation mine asset		1,730,217
(20,000,000 + 3,069,566) × (60,000 / 800,000)		
c. Journal entries at year end (Dec. 31, 2019)		
Dr. Interest expense (($3,069,566 + 153,478) × 5%)	161,152	
Cr. Site restoration obligation		161,152
Dr. Depreciation expense mine asset	2,595,326	
Cr. Accumulated depreciation mine asset		2,595,326
(20,000,000 + 3,069,566) × (90,000 / 800,000)		

P12-46. ***Suggested solution:***

a. The present value fair value of the site restoration obligations is determined using discounted cash flow analysis.

Value of principal = $5,000,000 / 1.05^{10} $3,069,566

Using a BAII PLUS financial calculator

- 10 N, 5 I/Y, 5000000 FV, CPT PV PV = –3,069,566 (rounded)

a. Journal entries for the site restoration obligation and construction costs (December 31, 2017)		
Dr. Mine asset	3,069,566	
Cr. Asset retirement obligation		3,069,566
Dr. Mine asset	20,000,000	
Cr. Cash		20,000,000
b. Journal entries at year end (Dec. 31, 2018)		
Dr. Accretion expense ($3,069,566 × 5%)	153,478	
Cr. Asset retirement obligation		153,478
Dr. Depreciation expense mine asset	1,730,217	
Cr. Accumulated depreciation mine asset		1,730,217
(20,000,000 + 3,069,566) × (60,000 / 800,000)		

c. Journal entries at year end (Dec. 31, 2019)		
Dr. Accretion expense (($3,069,566 + 153,478) × 5%)	161,152	
Cr. Asset retirement obligation		161,152
Dr. Depreciation expense mine asset	2,595,326	
Cr. Accumulated depreciation mine asset		2,595,326
(20,000,000 + 3,069,566) × (90,000 / 800,000)		

P12-47. ***Suggested solution:***

At the end of 2023, the remaining life of the obligation is four years (10 – 6 = 4). The present fair value of the site restoration obligations valued at the original interest rate of 5% is determined using discounted cash flow analysis.		
Value of principal	= $5,000,000 / 1.05^4	$4,113,512
Using a BAII PLUS financial calculator ▪ 4 N, 5 I/Y, 5000000 FV, CPT PV PV = –4,113,512 (rounded)		
At the beginning of 2024, the present fair value of the site restoration obligations valued at the revised interest rate of 4% is determined using discounted cash flow analysis.		
Value of principal	= $5,000,000 / 1.04^4	$4,274,021
Using a BAII PLUS financial calculator ▪ 4 N, 4 I/Y, 5000000 FV, CPT PV PV = –4,274,021 (rounded)		
a. Journal entry to record the change in the liability amount		
Dr. Mine asset	160,509	
Cr. Site restoration obligation		160,509
$4,274,021 - $4,113,512 = $160,509		

The original cost of the mine asset was $23,069,566 ($20,000,000 cost + 3,069,566 site restoration). 600,000 of the estimated 800,000 available tonnes have been extracted so the accumulated depreciation on the mine asset is $17,302,175 ($23,069,566 × 600,000 / 800,000 = $17,302,175). Hence, the remaining net book value at the beginning of 2024 is $5,767,391 ($23,069,566 - $17,302,175 = $5,767,391).

The revised net book value of the asset at the beginning of 2024 is $5,927,900 ($5,767,391 + $160,509 = $5,927,900). This amount must be depreciated over the remaining ore body of 200,000 tonnes. Depreciation for 2024 is $5,927,900 × 50,000 / 200,000 = $1,481.975.

The revised present value of the obligation and the new market-based interest rate are used to determine interest expense. $4,274,021× 4% = $170,961.

b. Journal entries at year end (Dec. 31, 2024)

Dr. Interest expense ($4,274,021 × 4%)	170,961	
Cr. Site restoration obligation		170,961
Dr. Depreciation expense mine asset (from above)	1,481,975	
Cr. Accumulated depreciation mine asset		1,481,975

P12-48. ***Suggested solution:***

Disclosures regarding an entity's indebtedness should cover essential aspects, including:

- The nature of contingent liabilities.
- A summary of the accounting policies used to determine the measurement basis of valuing liabilities; e.g. amortized cost.
- Pertinent details of the indebtedness, including collateral pledged and call or conversion privileges.
- The fair value of each class of financial liability and how this was determined; e.g., discounted cash flow analysis. This information need not be provided for financial instruments whose carrying value reasonably approximates the carrying value; e.g., trade payables.
- Total interest expense on liabilities other than those valued at fair value through profit and loss.
- A schedule that details the contractual maturity dates of financial liabilities.
- The nature and extent of risks arising from financial liabilities, including credit risk, liquidity risk, and market risk.
- Details of any obligations in default, including the carrying amount of loans in default at statement date and whether the default was remedied before the financial statements were issued.

P12-49. ***Suggested solution:***

a. As per Canadian Tire Corporation, Limited's balance sheet as at December 28, 2013, the company reported long-term liabilities totaling $3,858.0 million ($8,180.1 - $4,322.1) categorized as follows:

Type of liability	**Amount owing on Dec. 31, 2013 – in $millions**
Long-term provisions	$ 38.2
Long-term debt	2,339.1
Long-term deposits	1,152.0
Deferred income taxes	100.4
Other long-term liabilities	228.3
Total long-term liabilities	$3,858.0

b. The categories of provisions reported by Canadian Tire in Note 21 follow:

Type of provision	**Amount owing on Dec. 28, 2013 – in $millions**		
	Total	**Current**	**Long-term**
Sales and warranty returns	$109.5	$105.4	**$ 4.1**
Site restoration and decommissioning	32.4	9.4	**23.0**
Onerous contracts	3.2	3.0	**0.2**
Customer loyalty	71.2	69.8	**1.4**
Other	18.0	8.5	**9.5**
Total	$234.3	$196.1	**$38.2**

c. As per Note 26, the composition of the company's other long-term liabilities as at Dec. 28, 2013 follows:

Type of other long-term liability	**Amount owing on Dec. 28, 2013 – in $millions**
Employee benefits	$115.4
Deferred gains	21.3
Deferred revenue	14.3
Other	77.3
Total	$228.3

d. Canadian Tire reported $3,858.0 million in long-term liabilities at December 28, 2013 and total equity of $5,449.9 million. Its long-term debt to (total) equity ratio was thus $3,858.0 / $5,449.9 = 0.71:1.

P12-50. ***Suggested solution:***

a(i). The fair value of the note is determined using discounted cash flow analysis. The market rate suggested by the bank has been used to discount the obligation. List prices are not necessarily a reliable indicator of the asset's fair market value.

- PV = $10,500 / 1.06 = $9,906

Using a BAII PLUS financial calculator ▪ 1 N, 6 I/Y, 10500 FV, CPT PV PV = –9,906 (rounded)			
	Dr. Office furniture	9,906	
	Cr. Notes payable (furniture)		9,906
a(ii). The fair value of the note is determined using discounted cash flow analysis as the interest rate in the note is less than the market rate. ▪ PV = $1,040 × PVFA(8%,3) = $1,040 × 2.5771 = $2,680 Using a BAII PLUS financial calculator ▪ 3 N, 8 I/Y, 1040 PMT, CPT PV PV = –2,680 (rounded)			
	Dr. Office equipment ($2,680 + $500)	3,180	
	Cr. Notes payable (equipment)		2,680
	Cr. Cash		500
a(iii).	Dr. Cash	10,000	
	Cr. Notes payable (bank)		10,000
a(iv).	Dr. Interest expense ($9,906 × 6% × 365/365)	594	
	Cr. Notes payable (furniture)		594
	Dr. Interest expense ($2,680 × 8% × 334/365)	196	
	Cr. Notes payable (equipment)		196
	Dr. Notes payable (bank)	10,000	
	Dr. Interest expense ($10,000 × 6% × 302/365) (# days – include the day issued but not the day paid off)	496	
	Cr. Cash ($10,000 + $496)		10,496
a(v).	Dr. Notes payable (furniture) ($9,906 + $594)	10,500	
	Cr. Common shares		10,500

b. SSBC disclosure relative to the outstanding liabilities would include:
   - that the liabilities are carried at amortized cost
   - details of the indebtedness including the collateral pledged
   - the fair value of each class of financial liability and how this was determined
   - total interest expense
   - a schedule that details the contractual maturity dates of financial liabilities
   - the nature and extent of risks arising from financial liabilities, including credit, liquidity, and market risk

O. Mini-Cases

Case 1: Jackson Capital Inc. ***Suggested solution:***

Accounting Issues
This memo presents a review of the accounting issues associated with the long-term debt issued by JCI and its share capital as well as explores the issue of the company's cash flow.

Stock-indexed bond payable
On March 1, 2016, JCI issued long-term, 5%, stock-indexed bonds payable for $6 million. This bond, the principal repayment of which is indexed to the TSX Composite, bears the risk that the principal repayment will increase or decrease due to factors beyond the control of management. This factor makes valuation a key issue for this bond as it represents a contingent settlement provision. What is not clear here is whether the company originally elected to value the financial liability at fair value through profit or loss or at amortized cost. This needs to be determined as it will affect how the liability is accounted for.

If the liability is valued at fair value through profit or loss, then the bond would be reported at fair value on the balance sheet with the change in value from the previous balance sheet date being reported as a gain or loss on the income statement. Immediate recognition provides better matching and reflects the risk of the instrument.

If the liability is valued at amortized cost using the effective interest method, this would eliminate any earnings fluctuations due to revaluations caused by factors unrelated to the business. There is a presumption, however, that when the amortized cost method is used that the entity can reliably estimate the future cash flows related to the financial instrument. It may be difficult for the company to meet this test as this requires that they estimate the change in the TSX Composite Index six years forward.

The manner in which the liability should be classified is a matter of professional judgment. JCI should disclose the interest rate, maturity date, amount outstanding, and the terms of the debt in the notes to the financial statements.

Share capital
JCI's share capital includes 1 million 8% Class A preference shares redeemable at the holder's option on or after August 10, 2020. These Class A preference shares have some characteristics of a liability instrument (the holder has the right to require the issuer to redeem the share), even if the legal form is equity.

It is not clear whether the dividends on these shares are cumulative or non-cumulative and further investigation needs to be undertaken to determine this. If the dividends are cumulative, the entire $7 million should be classified as a liability with any dividends being classified as an interest expense. If, however, the dividends are non-cumulative the shares are a compound financial instrument with the liability component being the present value of the redemption amount. Dividends paid relate to the equity component and represent a distribution of profit and

loss.

Cash flow issues
JCI seems to have very few guaranteed sources of income and a very low level of short-term revenue. As well, the Brazilian debt may be subject to currency fluctuations and restrictions, making the cash flow from this loan extremely uncertain. To compound this problem, JCI seems to have a fairly high debt load (with the associated interest payments) and high operating expenses.

We need to carefully consider JCI's cash flow situation and what actions JCI would take if the company found itself short of operating cash. We should obtain representations from management as to which investments it would liquidate if cash flow needs arose. This assessment may affect the accounting treatment of certain investments (such as their classification as short term or long term). We should assess whether the value of the liquidated investments would cover JCI's cash flow needs. If we conclude that JCI is likely to run into serious cash flow difficulties, there may be a need to include a going-concern note in the financial statements or modify our audit report.

Case 2: Total Protection Limited. ***Suggested solution:***

Report on Accounting Policies
There are a number of users of the financial statements of TPL, each with different interests:

1. The shareholders/builders will use the financial statements to assess the profitability of the Company and to determine what cash, if any, should be distributed.
2. Safe-Way will calculate its royalties on the basis of the revenue-recognition policies adopted by the Company.
3. Customers may use the statements to determine the liquidity and viability of the Company before purchasing a warranty.
4. Other builders may rely on the statements before participating in the warranty programs. Their reputations are at stake.
5. The government may use the statements as part of its review of the Company's operations from time to time.

Accordingly, policies for accruals of future warranty costs will be of great importance to all the users and will affect the long-term viability of TPL. Given the number of users and high levels of assurance each requires, statements should be prepared in accordance with generally accepted accounting principles, with the appropriate disclosures.

The most significant accounting policies that must be developed are for warranty liabilities and expenses and for revenue recognition.

Matching the revenues and expenses is the critical issue because the largest portion of cash from warranty sales is received upfront and expenditures will be made on warranty repairs unevenly over the following 10 years.

To the extent that cash reserves are in place to meet future contingencies, interest will be earned on those funds. Policies should be re-evaluated from year to year according to repair experience and potential increases in reserves from investment income.

Warranty liabilities and expenses
Future warranty expenses are difficult to estimate because few warranties of 10 years have been offered in the marketplace. Accordingly, data on repair history for warranties longer than one year are not available in the industry. Further complicating estimations is the fact that new builders do not use materials and construction techniques of identical quality, and there are no controls over the builders participating in the plan.

The market-decline provision due to faulty construction is unique in this industry, so no comparable information is available to determine the extent of the risk arising from this coverage.

Despite the problems with warranty cost estimation, an attempt must be made to quantify the estimated future liability by reviewing the repair history of each builder participating in the plan and the nature of the repairs incurred to date. Otherwise, revenue cannot be recognized until the downstream costs can be reliably estimated.

Historical repair data from each builder should be reviewed to properly estimate the current portion of the warranty liability at the balance sheet date. This is particularly important in light of the Company's liquidity objective.

Revenue recognition
Warranties are a service, as opposed to a good, and as such the revenue recognition criteria of paragraphs 20 and 26 of IAS 18 apply:

¶20 When the outcome of a transaction involving the rendering of services can be estimated reliably, revenue associated with the transaction shall be recognised by reference to the stage of completion of the transaction at the end of the reporting period. The outcome of a transaction can be estimated reliably when all of the following conditions are satisfied:

(a) the amount of revenue can be measured reliably;
(b) it is probable that the economic benefits associated with the transaction will flow to the entity;
(c) the stage of completion of the transaction at the end of the reporting period can be measured reliably; and
(d) the costs incurred for the transaction and the costs to complete the transaction can be measured reliably.

26 When the outcome of the transaction involving the rendering of services cannot be estimated reliably, revenue shall be recognised only to the extent of the expenses recognized that are recoverable.

Given that the home warranties cover multiple years, ideally revenue should be recognized over the period of coverage. If this policy is adopted, a straight-line method is probably not appropriate as the reality of warranties for homes is that the majority of claims will occur in the first two years; if there is a problem with construction, it is much more likely to become apparent in the first year than in later years. Hence, revenues should be recognized in a manner that is higher initially and lower later in a manner that reflects the stage of completion of the service provided. It remains, though, that there is insufficient information to reliably estimate the downstream warranty costs; accordingly, as per paragraph 26, TPL can recognize revenue

only to the extent that expenses have been incurred and are recoverable. At this point, due to the upfront fee, recoverability is not an issue and as such revenue can be recognized to the extent that expenses have been incurred ($224,000 as per Exhibit I).

Other accounting issues
The repairs and rent charged by Safe-Way to TPL and the royalties received by Safe-Way from the Company are related-party transactions. Details of these transactions must be fully disclosed in the financial statements.

Case 3: Kaitlyn's Cats Inc. ***Suggested solution:***

a. This is a very common form of presentation. The benefits include: i) that it is easily understandable by even unsophisticated readers—KCI owes $523,973; ii) the amount reported complies with IFRS 9—the liability is initially valued at its fair value less transaction costs; and iii) the form of presentation does not emphasize premiums and discounts. This is the only one of the three proposals that complies with the governing standardIFRS 9. One drawback is that the recorded obligation does not accurately portray the fair value of the debt incurred—$538,973. Moreover, after issue date, the liability will be reported at amortized cost, which does not allow for changes in the fair value of the amount owed due to changes in the market rate of interest.

One benefit of this approach is that the presentation accurately portrays the substance of the transaction. KCI owes $500,000 at maturity; the bondholders paid a premium to acquire the bonds as the rate of interest offered by KCI is higher than the market rate, and the company spent $15,000 on bond-issue-related costs. Another benefit is that the excess of proceeds specifically relating to obligation to pay a rate of interest that is higher than the current market rate of interest is shown separately.

This method of presentation does not comply with IFR 9, though, as the transaction costs must be netted against the loan proceeds and expensed over time using the effective interest method. Also, arguably bond issue costs should be expensed as they do not meet the definition of an asset, which is partially described in IAS 38 as a resource from which future economic benefits are expected to flow to the entity. Critics of this approach contend that the expenditure is analogous to installation costs of equipment. While not directly recoverable, they are necessary to prepare the equipment for use and as such should be expensed over time. While debate of this point is likely to continue, IFRS 9 explicitly sets out the required accounting treatment for directly attributable transaction costs on liabilities carried at amortized cost. As such, proposal 2 does not comply with this standard.

The benefits to this form of presentation include that the liability initially recorded accurately depicts the fair value of the obligation undertaken. Also, it appeals to those who contend that the transaction costs should be immediately expensed as they do not provide an enduring economic benefit. The drawback of this proposal is that it does not comply with IFRS 9 with respect to the initial measurement of liabilities recorded at amortized cost.

b. The effective rate of interest is 2.6870% per period or 5.4462% per annum [PV – 523,973; FV = 500,000; N = 20; PMT = 15,000; CPT I/Y; I/Y = 2.6870 (rounded);

$(1 + .026870)^2 – 1 = 5.4462\%$ (rounded)]. The effective rate is used to determine interest expense as it reflects the interest obligation that KCI accepted at the time of issue inclusive of transaction costs. Using the effective interest rate to discount cash outflows results in the book value of the bond at maturity equalling that of the required cash outflow—$500,000. Also, using the effective interest method provides for more accurate matching of interest costs to the outstanding liability.

c. When KCI issues the bonds, it is entering into two related but separate obligations. The first is to pay the principal at maturity and the second is to pay interest every six months over the life of the bond. The $500,000 payout is the same as that that would be received by investors purchasing $500,000 of 5% bonds so can be ignored for the balance of this discussion. The difference lies in the series of interest payments—an annuity—that the investor expects to receive. The KCI bonds pay $15,000 every six months whereas bonds that pay the market rate of 5% per annum only pay $12,500 every six months. Clearly, from an investor's point of view, receiving $15,000 every six months is more desirable than receiving $12,500. Given this, investors are willing to pay more than $500,000 to receive the incremental interest payment. They collectively bid up the price to $538,973 which is the present value of the future cash flows discounted at the market rate of interest.

d. Yes, if KCI designates the liability as at fair value through profit or loss my answer to part "a" will change. Specifically, IFRS 9 requires that the liability be initially measured at its fair value ($538,973) and that the transaction costs ($15,000) be expensed. This required accounting treatment is consistent with that illustrated in possibility 3.

Case 4: Non-current liabilities. ***Suggested solution:***

a. If the bonds were issued at the price of 92.46, then the gross proceeds were $7,396,800 (8,000,000 x 0.9246). Now we can calculate the bond yield.

N = 5 × 2 = 10
PV = –7,396,800
PMT = 8,000,000 × 9% × ½ = 360,000
FV = 8,000,000
i = **5.5% per period**
Thus, the price indicates that the customer requires a market interest rate of 5.5% for each six month period which can be multiplied by to 2 derive a nominal annualized rate of 11% per year.

To find the net proceeds, we need to subtract the bond issue costs. Given investors paid $7,396,800, and bond issue costs totalled $280,010, net proceeds were $7,116,790.

b. The market rate on the other bond is 10%, which is lower than the rate on this bond. There may be many reasons as to why the interest rate on the other bond is lower, including:

i. It is possible that the other bond has collateral, which lowers the risk of lending, and therefore bondholders require a lower interest rate.
ii. It is possible that the other bond is a serial bond, which reduces the risk of collection to investors as the principal is collected over time.
iii. The other bond might have seniority over the new bond.
iv. The other bond might have stronger debt covenants that better protect the investor.
v. The other bond might have a shorter term, which might be another reason for lower rate, again due to reduced risk.
vi. The other bond might have other features (e.g., convertible or retractable) that give the bondholders other benefits that may compensate them for the lower yield.

c. The straight-line amortization method's main advantage is the simplicity of the interest expense calculation. However, with the availability of technology, calculation of interest expense using the effective interest method is also very easy, reducing the benefit of using the straight-line method. The main disadvantage of the straight-line method is that it fails to present the true cost of borrowing for the company. For example, observe in Exhibit 12-13c on page 583 of the text, the interest expense recorded on July 01, 2018 under the straight-line method is $34,441 on a bond with an amortized cost of $973,357. This represents an annual interest rate of 7.08% ($34,441/$973,357 × 2), while the yield on this bond is 7%.

d.

Journal entry:

Dr. Cash	$7,116,790	
Cr. Bonds payable		$7,116,790

Bond issue costs are reported as a reduction of the carrying value. [$7,396,800 – $280,010 = $7,116,790].

e. In order to prepare the bond amortization schedule, we need to re-calculate the effective interest on the bond, taking in consideration the bond issue costs.

N = 5 × 2 = 10
PV = –7,116,790
PMT = 8,000,000 × 9% × ½ = 360,000
FV = 8,000,000
i = **6% per period**

Thus, including the bond issue costs, the annualized nominal interest rate is 12%.

The amortization schedule follows:

Date	Carrying value beginning	Interest payment	Interest expense	Discount amortization	Carrying value ending
2017 Aug 1					7,116,790

2018 Jan 31	7,116,790	360,000	427,007	67,007	7,183,797
2018 July 31	7,183,797	360,000	431,028	71,028	7,254,825
2019 Jan 31	7,254,825	360,000	435,290	75,290	7,330,115
2019 July 31	7,330,115	360,000	439,807	79,807	7,409,922
2020 Jan 31	7,409,922	360,000	444,595	84,595	7,494,517
2020 July 31	7,494,517	360,000	449,671	89,671	7,584,188
2021 Jan 31	7,584,188	360,000	455,051	95,051	7,679,239
2021 July 31	7,679,239	360,000	460,754	100,754	7,779,993
2022 Jan 31	7,779,993	360,000	466,800	106,800	7,886,792
2022 July 31	7,886,792	360,000	473,208	113,208	8,000,000

Small differences due to rounding

f. The amount that was paid to retire the bonds = $2,376,000 ($8,000,000 × 0.99 × 30%). The carrying value of the bonds on August 1, 2021 = $2,333,998 ($7,779,993 × 30%, see the table above). Therefore the loss on redemption is $42,002.

The journal entry to record the retirement of the debt:

Dr. Bonds Payable	$2,333,998	
Dr. Loss on bond retirement	$42,002	
Cr. Cash		$2,376,000

For further in class discussions:

As is pointed out in the bonds overview section on page 570 of the text, the "actual annual return" of a bond depends on the number of payments made per year. This is because if there is more than one payment per year, there will be an opportunity for the payout amount itself to be gathering compound interest throughout the year.

Regarding the calculations of the effective interest rate there is a description on page 588 of the text explaining the key entries to use a financial calculator (BAII Plus model). Also, it should be pointed out that for many it will be easier to use a spreadsheet function – for example, in Microsoft Excel you would click on the "Formulas" tab and then select "Financial" types of functions and then scroll down to the "RATE" function. It is an easy matter to enter the required amounts in the input cells to derive the period's effective interest rate.