Bonds and long-term notes payable

Issuing bonds at a discount

A discount on bonds payable occurs when a company issues bonds with a contract rate less than market rate. (issue price is less than 100%)

To illustrate, let's assume that the Fila bonds discussed earlier are issued on December 31, 2002, at the discounted price of $92,277 (92.277% of par value). Fila records the bond issue as follows:

2002			
Dec. 31	Cash	92,277	
	Discount on Bonds Payable	7,723	
	Bonds Payable..		100,000
	Sold bonds at a discount on the original issue date.		

These bonds obligate the issuer to pay out two different future cash flows:

1. $100,000 face amount at the end of the bonds' five-year life, and
2. $4,000 interest (8% × $100,000 × 6/12) at the end of each six-month interest period of the bonds' five-year life.

The pattern of cash flows for Fila's bonds is shown in Exhibit 17.7.
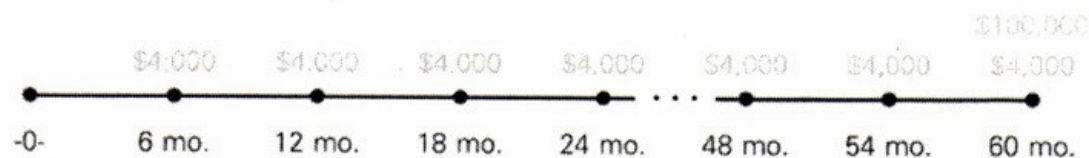
							$100,000
$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	
-0-	6 mo.	12 mo.	18 mo.	24 mo.	48 mo.	54 mo.	60 mo.

These bonds are reported in the *long-term liability* section of the issuer's December 31, 2002, balance sheet as shown in Exhibit 17.8.

Amortizing a bond discount

Amount repaid:

Ten interest payments of $4,000	$ 40,000
Par value at maturity	100,000
Total repaid to bondholders	$140,000
Less: Amount borrowed from bondholders	92,277
Total bond interest expense	$ 47,723

Alternative Computation

Ten payments of $4,000	$ 40,000
Add: Discount	7,723
Total bond interest expense	$ 47,723

Accounting for Fila's bonds must include two procedures:

1. Allocating the total bond interest expense of $47,723 across the 10 six-month periods in the bonds' life, and

2. Updating the carrying value of the bonds at each balance sheet date.

To allocate the total bond interest expense over the life of the bonds, known as amortizing the bond discount, either the straight-line or effective interest method can be used. Both methods reduce the discount on the bonds over the life of the bonds.

Straight-line method

The **straight-line method** of allocating interest allocates an equal portion of the total bond interest expense to each of the six-month interest periods.

To apply the straight-line method to Fila's bonds, we divide the five years' total expense of $47,723 by 10 (the number of semi-annual periods in the bonds' life). This gives us a total bond interest expense of $4,772 per period.[5] Alternatively, we can find this number by dividing the $7,723 original discount by 10. The resulting $772 is the amount of discount to be amortized in each interest period. When the $772 of amortized discount is added to the $4,000 cash interest payment, the total bond interest expense for each six-month period is $4,772.

The issuer records bond interest expense and updates the balance of the bond liability for each semi-annual cash payment with this entry:

2003			
June 30	Bond Interest Expense	4,772	
	Discount on Bonds Payable		772
	Cash...		4,000
	To record six months' interest and		
	discount amortization.		

Fila incurs a $4,772 bond interest expense each period but pays only $4,000. The $772 unpaid interest each period is part of the amount to be repaid when the bond becomes due ($7,723 discount + $92,277 issue price = $100,000 total face amount to be paid at maturity).

The $772 credit to the Discount on Bonds Payable account *increases* the bonds' carrying value as shown in Exhibit 17.10. This increase occurs because we *decrease* the balance of the Discount on Bonds Payable (contra) account, which is subtracted from the Bonds Payable account. Exhibit 17.10 shows this pattern of decreases in the Discount on Bonds Payable account (the unamortized discount), along with increases in the bonds' carrying value.

Dec. 31/02				$7,723	$92,277
Jun. 30/03	4,000	4,772	772	6,951[1]	93,049
Dec. 31/03	4,000	4,772	772	6,179[2]	93,821
Jun. 30/04	4,000	4,772	772	5,407	94,593
Dec. 31/04	4,000	4,772	772	4,635	95,365
Jun. 30/05	4,000	4,772	772	3,863	96,137
Dec. 31/05	4,000	4,772	772	3,091	96,909
Jun. 30/06	4,000	4,772	772	2,319	97,681
Dec. 31/06	4,000	4,772	772	1,547	98,453
Jun. 30/07	4,000	4,772	772	775	99,225
Dec. 31/07	4,000	4,775*	775*	-0-	100,000
Totals	$40,000	$47,723	$7,723		

*Adjusted for rounding.
[1] 7,723 − 772 = 6,951
[2] 6,951 − 772 = 6,179

We can summarize the following points in applying straight-line amortization to the discount on Fila's bonds over its life of 10 semi-annual periods:

1. The $92,277 cash received from selling the bonds equals the $100,000 par value of the bonds less the initial $7,723 discount from selling the bonds for less than par.

2. Semi-annual bond interest expense of $4,772 equals total bond interest expense of $47,723 divided by 10 semi-annual periods (alternatively computed as the periodic cash interest paid of $4,000 plus the periodic discount amortization of $772).

3. Semi-annual credit of $772 to the Discount on Bonds Payable account equals the total discount of $7,723 divided by 10 semi-annual periods.

4. Semi-annual $4,000 interest payment equals the bonds' $100,000 par value multiplied by the 4% semi-annual contract rate.

5. Carrying (or book) value of bonds continues to grow each period by the $772 discount amortization until it equals the par value of the bonds when they mature as shown in Exhibit 17.10.

Effective interest method

The **effective interest method**, or simply *interest method*, allocates bond interest expense over the life of the bonds in a way that yields a constant rate of interest. *This constant rate of interest is the market rate at the issue date.* The effect of selling bonds at a premium or discount is that the issuer incurs the prevailing market rate of interest at issuance and not the contract rate. Bond interest expense for a period is found by multiplying the balance of the liability at the end of the last period by the bonds' original market rate. An amortization table can be constructed to help us keep track of interest allocation and the balances of bond related accounts.

Effective Interest Amortization of Bond Discount

Bonds: $100,000 par value, semi-annual interest payments, five-year life, 4% semi-annual contract rate, 5% semi-annual market rate.

	(A)	(B)	(C)	(D)	(E)
Dec. 31/02				$7,723	$92,277
Jun. 30/03	$4,000	$4,614[1]	$614	$7,109	92,891
Dec. 31/03	4,000	4,645[2]	645	6,464	93,536
Jun. 30/04	4,000	4,677	677	5,787	94,213
Dec. 31/04	4,000	4,711	711	5,076	94,924
Jun. 30/05	4,000	4,746	746	4,330	95,670
Dec. 31/05	4,000	4,784	784	3,546	96,454
Jun. 30/06	4,000	4,823	823	2,723	97,277
Dec. 31/06	4,000	4,864	864	1,859	98,141
Jun. 30/07	4,000	4,907	907	952	99,048
Dec. 31/07	4,000	4,952	952	-0-	100,000
	$40,000	$47,723	$7,723		

[1] $92,277 \times 0.05 = 4,614$
[2] $92,891 \times 0.05 = 4,645$

Column (A) is the bonds' par value ($100,000) multiplied by the semi-annual contract rate (4%).

Column (B) is the bonds' prior period carrying value multiplied by the semi-annual market rate (5%).

Column (C) is the difference between interest paid and bond interest expense, or [(B) – (A)].

Column (D) is the prior period's unamortized discount less the current period's discount amortization.

Column (E) is the bonds' par value less unamortized discount, or [$100,000 – (D)].

The amortization table shows how the balance of the discount (column D) is amortized by the effective interest method until it reaches zero. The bonds' carrying value changes each period until it equals par value at maturity. Total bond interest expense is $47,723, comprised of $40,000 of semi-annual cash interest payments and $7,723 of the original discount below par value.

Balance sheet presentation of bond discount

	Dec. 31 2004	Dec. 31 2003
Long-term liabilities:		
Bonds payable, 8%, due December 31, 2007	$100,000	$100,000
Less: Discount on bonds payable..	5,076	6,464
Carrying value...	$ 94,924	$ 93,536

Five-year, 6% bonds with a $100,000 par value are issued at a price of $91,893. Interest is paid semi-annually, and the market rate is 8% on the issue date. Use this information to answer the following questions:

4. Are these bonds issued at a discount or a premium? Explain why.

5. What is the issuer's journal entry to record the sale?

6. What is the amount of bond interest expense recorded at the first semi-annual cash payment using the (a) straight-line method and (b) effective interest method?

Issuing bonds at a premium

When bonds carry a contract rate greater than the market rate, the bonds sell at a price greater than par value (or > 100%). The difference between par and market value is the **premium on bonds**. Buyers bid up the price of bonds above the bonds' par value until it reaches a level yielding the market rate.

To illustrate, let's assume that the Hydro Quebec bonds discussed earlier are issued on December 31, 2002 at 104.92 (104.92% of par value), which amounts to $104,920. Hydro Quebec records the bond issue with this entry:

```
2002
Dec. 31    Cash ........................................................    104,920
                Premium on Bonds Payable...................              4,920
                Bonds Payable.....................................            100,000
           Sold bonds at a premium on the original
           issue date.
```

Hydro Quebec's bonds obligate it to pay out two different future cash flows:

1. $100,000 face amount at the end of the bonds' three-year life.
2. $7,000 (= 14% × $100,000 × 6/12) at the end of each six-month interest period of the bonds' three-year life.

The pattern of cash flows for Hydro Quebec bonds is shown in Exhibit 17.13.
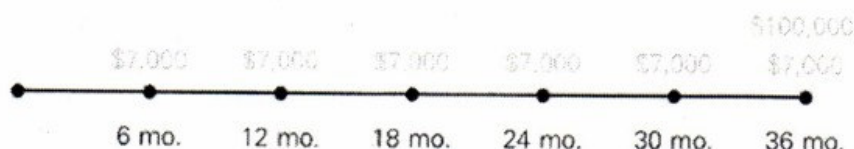
These bonds are reported in the long-term liability section of the issuer's December 31, 2002, balance sheet as shown in Exhibit 17.14.

Long-term liabilities:		
Bonds payable, 14%, due December 31, 2005	$100,000	
Add: Premium on bonds payable...	4,920	$104,920

The premium is added to the par value of the bonds to produce the carrying (book) value of the bonds payable. The Premium on Bonds Payable is an adjunct (also called accretion) liability account.

Amortizing a Bond Premium

The issuer (Hydro Quebec) receives $104,920 for its bonds and will pay bond-holders the $100,000 face amount after six years have passed plus interest payments totalling $42,000. Because the $4,920 premium is not repaid to bondholders at maturity, it reduces the expense of using the $104,920 for three years.

The upper portion of Exhibit 17.15 shows that total bond interest expense of $37,080 is the difference between the total amount repaid to bondholders ($142,000) and the amount borrowed from bondholders ($104,920). Alternatively, we can compute total bond interest expense as the sum of the interest payments less the bond premium. The premium is subtracted because it will not be paid to the bondholders when the bonds mature. This alternative computation is shown in the lower portion of Exhibit 17.15. Total bond interest expense is allocated over the six semi-annual periods with either the straight-line or the effective interest method.

Amount repaid:	
Six interest payments of $7,000	$ 42,000
Par value at maturity	100,000
Total repaid to bondholders	$142,000
Less: Amount borrowed from bondholders	104,920
total bond interest expense	$ 37,080

Alternative Computation

Six payments of $7,000	$ 42,000
Less: Premium	4,920
Total interest expense	$ 37,080

Straight Line Method

We explained how the straight-line method allocates an equal portion of total bond interest expense to each of the bonds' interest periods. To apply the straight-line method to Hydro Quebec's bonds, we divide the three years' total bond interest expense of $37,080 by six (the number of semi-annual periods in the bonds' life). This gives us a total bond interest expense of $6,180 per period.

The issuer records bond interest expense and updates the balance of the bond liability for each semi-annual cash payment with this entry:

2003			
June 30	Bond Interest Expense	6,180	
	Premium on Bonds Payable	820	
	Cash		7,000
	To record six months' interest and premium amortization.		

This is the entry made at the end of each of the six semi-annual interest periods. The $820 debit to the Premium on Bonds Payable account decreases the bonds' carrying value. Exhibit 17.16 shows an amortization table using the straight-line method for the Hydro Quebec bonds.

Exhibit 17.16

Bond Premium and Carrying Value Under Straight-Line

Period Ending	(A) Cash Interest Paid $100,000 × 14% × 6/12	(B) Period Interest Expense 37,080/6	(C) Premium Amort. 4,920/6	(D) Unamortized Premium	(E) Carrying Value $100,000 + (D)
Dec. 31/02				$4,920	$104,920
June 30/03	7,000	6,180	820	4,100[1]	104,100
Dec. 31/03	7,000	6,180	820	3,280[2]	103,280
June 30/04	7,000	6,180	820	2,460	102,460
Dec. 31/04	7,000	6,180	820	1,640	101,640
June. 30/05	7,000	6,180	820	820	100,820
Dec. 31/05	7,000	6,180	820	-0-	100,000
Totals	$42,000	$37,080	$4,920		

[1] 4,920 − 820 = 4,100
[2] 4,100 − 820 = 3,280

9

Effective Interest Amortization of Bond Premium

	(A)	(B)	(C)	(D)	(E)
Dec. 31/02				$4,920	$104,920
June 30/03	7,000	6,295[1]	705	4,215	104,215
Dec. 31/03	7,000	6,253[2]	747	3,468	103,468
June 30/04	7,000	6,208	792	2,676	102,676
Dec. 31/04	7,000	6,161	839	1,837	101,837
June 30/05	7,000	6,110	890	947	100,947
Dec. 31/05	7,000	6,053*	947	-0-	100,000
Totals	$42,000	$37,080	$4,920		

*Adjusted for rounding.
[1] $104,920 \times 0.06 = 6,295$
[2] $104,215 \times 0.06 = 6,253$

Column (A) is the bonds' par value ($100,000) multiplied by the semi-annual contract rate (7%).

Column (B) is the bonds' prior period carrying value multiplied by the semi-annual market rate (6%).

Column (C) is the difference between interest paid and bond interest expense, or [(A) – (B)].

Column (D) is the prior period's unamortized premium less the current period's premium amortization.

Column (E) is the bonds' par value plus unamortized premium, or [$100,000 + (D)].

Column A lists the semi-annual cash payments. Column B shows the amount of expense computed as the 6% market rate multiplied by the beginning carrying value. The amount of cash paid out in Column A is larger than bond interest expense because the cash payment is based on the higher 7% semi-annual contract rate. The excess cash payment over the expense reduces the principal. These amounts are shown in Column C. Column E shows the new carrying value after the amortized premium in Column C is deducted from the prior period's carrying value. Column D shows how the premium is reduced by the amortization process over the life of the bonds.

The effect of premium amortization on the bond interest expense and the bond liability is seen in the journal entry on June 30, 2003, when the issuer makes the first semi-annual interest payment:

2003			
June 30	Bond Interest Expense	6,295	
	Premium on Bonds Payable	705	
	Cash		7,000
	To record six months' interest and premium amortization.		

Similar entries are recorded at each payment date until the bonds mature at the end of 2005. The effective interest method yields decreasing amounts of bond interest expense and increasing amounts of premium amortization over the bonds' life.

Accruing Bond Interest Expense

If a bond's interest period does not coincide with the issuing company's accounting period, an adjusting entry is necessary to recognize bond interest expense accruing since the most recent interest payment.

To illustrate, let's assume that the Hydro Quebec bonds described in Exhibit 17.17 were issued on December 31, 2002. If Hydro Quebec's year-end is April 30, four months of bond interest and premium amortization accrue (from December 31, 2002, to April 30, 2003). An adjusting entry is needed to capture:

1. Four months of interest equal to $4,197 (= $6,295 from column (B) of Exhibit 17.17 × 4/6), and

2. Four months of premium amortization equal to $470 (= $705 from column (C) of Exhibit 17.17 × 4/6).

The resulting interest payable is $4,667, the sum of the $4,197 interest expense and $470 premium amortization (also calculated as $7,000 from column (A) of Exhibit 17.17 × 4/6). We record these effects with this adjusting entry:

2003			
Apr. 30	Bond Interest Expense	4,197	
	Premium on Bonds Payable	470	
	Interest Payable		4,667
	To record four months' accrued interest and premium amortization.		

Similar entries are made on each April 30 year end throughout the three-year life of the bonds.

When the $7,000 cash payment occurs on the next interest date, the journal entry recognizes the bond interest expense and amortization for May and June of 2003. It must also eliminate the interest payable liability created by the April 30 adjusting entry. In this case we make the following entry to record payment on June 30, 2003:

2003			
June 30	Interest Payable	4,667	
	Bond Interest Expense ($6,295 × 2/6)	2,098	
	Premium on Bonds Payable ($705 × 2/6)	235	
	Cash		7,000
	To record two months' interest and amortization and eliminate the accrued interest liability.		

The interest payments made each December 31 are recorded as usual because the entire six-month interest period is included within a single fiscal year.

Problems

Use this information to solve Flashback questions 7, 8, and 9: On December 31, 2001, a company issued 16%, 10-year bonds with a par value of $100,000. Interest is paid on June 30 and December 31. The bonds are sold at an issue price of $110,592 to yield a 14% annual market rate.

Are these bonds issued at a discount or a premium? Explain why.

Using the effective interest method of allocating bond interest expense, the issuer records the second interest payment (on December 31, 2002) with a debit to Premium on Bonds Payable in the amount of: (a) $7,470; (b) $7,741; (c) $259; (d) $530; or (e) $277.

How are the bonds reported in the long-term liability section of the issuer's balance sheet as of December 31, 2002?

On May 1, a company sells 9% bonds with a $500,000 par value that pays semi-annual interest on each January 1 and July 1. The bonds are sold at par value plus interest accrued since January 1. The bond issuer's entry to record the first semi-annual interest payment on July 1 includes: (a) A debit to Interest Payable for $15,000; (b) A debit to Bond interest expense for $22,500; or (c) A credit to Interest Payable for $7,500.

On February 1, 2002, Enviro-Engineering Inc. has available for issue a $416,000 5% three-year bond. Interest is to be paid semi-annually beginning August 1, 2002.

Required
Part 1

Calculate the issue price of the bonds assuming a market interest rate of:

a. 5%

b. 4%

c. 6%

Part 2

Assuming the bonds were issued on July 1, 2002, at a market interest rate of 5%, prepare the entries for the following dates:

a. July 1, 2002 (date of issue)

b. August 1, 2002 (interest payment date)

Part 3

Assuming the bonds were issued on Feb. 1, 2002, at a market interest rate of 4%:

a. Prepare an amortization schedule using the straight-line method.

b. Record the entries for the following dates:

   i. February 1, 2002 (date of issue)

   ii. August 1, 2002 (interest payment date)

   iii. September 30, 2002 (Enviro's year-end)

Part 4

Assuming the bonds were issued on February 1, 2002, at a market interest rate of 6%:

a. Prepare an amortization schedule using the effective interest method.

b. Record the entries for the following dates:

   i. February 1, 2002 (date of issue)

   ii. August 1, 2002 (interest payment date)

   iii. September 30, 2002 (Enviro's year-end)

Use the following information for QS 17-19 to 17-23:

Holiday Corporation issued a $95,000, 7%, four-year bond on September 1, 2002, for cash of $92,300. Interest is to be paid semi-annually beginning March 1, 2003. Assume a year-end of April 30. The amortization schedule, using the straight-line method, is shown below:

Period Ending	(A) Cash Interest Paid $95,000 7% × 6/12	(B) Period Interest Expense $2,700/8	(C) Discount Amort. $2,700/8	(D) Unamortized Discount	(E) Carrying Value $95,000 − (D)
Sept. 1/02				2,700	92,300
Mar. 1/03	3,325	3,663	338	2,362	92,638
Sept. 1/03	3,325	3,663	338	2,024	92,976
Mar. 1/04	3,325	3,663	338	1,686	93,314
Sept. 1/04	3,325	3,663	338	1,348	93,652
Mar. 1/05	3,325	3,663	338	1,010	93,990
Sept. 1/05	3,325	3,663	338	672	94,328
Mar. 1/06	3,325	3,663	338	334	94,666
Sept. 1/06	3,325	3,659*	334*	-0-	95,000
Totals	**26,600**	**29,300**	**2,700**		