Name: _____ **Class:** _____ **Date:** _____ **ID: A**

End of Chapter 6 Problems

Numeric Response

1. Refer to the T-note and T-bond quote in Table 6-1.
   a. What is the asking price on the 9.25 percent February 2016 T-bond if the face value of the bond is $10,000?
   b. What is the bid price on the 4.875 percent August 2008 T-note if the face value of the bond is $10,000?

2. Refer again to Table 6-1.
   a. Verify the Asked price on the 5.000 percent July 2008 T-note for September 28, 2007. The Asked yield on the note is 4.10 percent and the note matures on July 31, 2008. Settlement occurs two business days after purchase; i.e., you would take possession of the note on September 30, 2007.
   b. Verify the Asked yield on the 4.00 percent February 2014 T-note for September 28, 2007. The Asked price is 98:05 and the note matures on February 15, 2014.

3. Refer to Table 6-1.
   a. Verify the September 28, 2007 Asked yield of 3.94% on the Treasury Bond, stripped Principal STRIP maturing August 2009. Use a two-day settlement period from the date of purchase (Le., ownership occurs on September 30,2007). The STRIP matures on August 15,2009.
   b. Verify the Asked price (68.681) on the Treasury note, stripped Principal STRIP maturing in February 2016, Le., the STRIP matures on February 15,2016,

4. On October 5, 2010, you purchase a $10,000 T-note that matures on August I5, 2021 (settlement occurs two days after purchase, so you receive actual ownership of the bond on October 7,2010). The coupon rate on the T-note is 4.375 percent and the current price quoted on the bond is 105:08 (or 105,25% of the face value of the T-note). The last coupon payment occurred on May 15,2010 (145 days before settlement), and the next coupon payment will be paid on November IS, 2010 (39 days from settlement),
   a. Calculate the accrued interest due to the seller from the buyer at settlement.
   b. Calculate the dirty price of this transaction.
   c. Calculate the yield to maturity (based on the clean price) on the bond received on October 7, 2010, and maturing on August 15, 2021 (or in 10.8603 years).

5. Consider an investor who, on January I, 2011, purchases a TIPS bond with an original principal of $100,000, an 8 percent annual (or 4 percent semiannual) coupon rate, and 10 years to maturity.

   a. If the semiannual inflation rate during the first six months is 0.3 percent. What is the principal amount used to determine the first coupon payment? What is the first coupon payment?

   b. Suppose that the semiannual inflation rate for the second six-month period is 1 percent. What is the inflation-adjusted principal at the end of the second six month period? What is the coupon payment for the second six-month period?

6. You can invest in taxable bonds that are paying a 9.5 percent annual rate of return or a municipal bond paying a 7,75 percent annual rate of return, If your marginal tax rate is 21 percent, which security bond should you buy?

7. A municipal bond you are considering as an investment currently pays a 6.75 percent annual rate of return.
   a. Calculate the tax equivalent rate of return if your marginal tax rate is 28 percent.
   b. Calculate the tax equivalent rate of return if your marginal tax rate is 21 percent.

8. Refer to Table 6-6.
   a. On September 27, 2007, what were the coupon rate, price, and yield on municipal bonds issued by the Illinois Municipal Electric Power Supply?
   b. What was the price, on September 26, 2007, on Maryland (MD) Transportation authority bonds maturing on July 1, 2037?

9. Refer to Table 6-7.
   a. What was the price on the AT&T 6.50 percent coupon bonds on September 28, 2007?
   b. What was the S&P bond rating on Home Dept 3.75 percent coupon bonds maturing in 2009 on September 28, 2007?
   c. What was the price on IBM 3.8 percent bonds on September 27,2007?

10. Using a Spreadsheet to Calculate Bond Values: What is the bond quote for a $1,000 face value bond with an 8 percent coupon rate (paid semiannually) and a required return of 7,5 percent if the bond is 6.48574, 8.47148, 10.519, and 14.87875 years from maturity?

Face value	Total payments	Periodic coupon payment	Required Payment	The Bond Value Will Be
100%	6.48574x2=12.97148	8%/2=4%	7.5%	102-17%
100	8.47148x2=16.94296	4	7.5	103-03
100	10.519x2=21.0380	4	7.5	103-19
100	14.87875x2=29.7575	4	7.5	104-14

11. Hilton Hotels Corp. has a convertible bond issue outstanding. Each bond, with a face value of $1,000, can be converted into common shares at a rate of 61.2983 shares of stock per $1,000 face value bond (the conversion rate), or $16.316 per share. Hilton's common stock is trading (on the NYSE) at $15.90 per share and the bonds are trading at $975.
    a. Calculate the conversion value of each bond.
    b. Determine if it is currently profitable for bond holders to convert their bonds into shares of Hilton Hotel common stock,

Short Answer

12. What are capital markets, and how do bond markets fit into the definition of capital markets?

13. What are the differences between T-bills, T-notes, and T-bonds?

14. What is a STRIP? Who would invest in a STRIP?

15. What is the difference between general obligation bonds and revenue bonds?

16. What is the difference between bearer bonds and registered bonds?

17. What is the difference between term bonds and serial bonds?

18. Which type of bond-a mortgage bond, a debenture, or a subordinated debenture-generally has the
    a. Highest cost to the bond issuer?
    b. Least risk to the bond holder?
    c. Highest yield to the bond holder? I&. What is a convertible bond? Is a convertible bond more or less attractive to a bond holder than a nonconvertible bond?

19. What is a convertible bond? Is a convertible bond more or less attractive to a bondolder than a noncovertible bond?

20. What is a callable bond? Is a call provision more or less attractive to a bond holder than a noncallable bond?

21. Explain the meaning of a sinking fund provision on a bond issue.

22. What is the difference between an investment-grade bond and a junk bond?

23. Go to the S&P Educational Version of Market Insight Web site at www.mhhe.com/edumarketinsight and find the S&P credit rating for Boeing Corp. (BA) and Texas Instruments (TXN) using the following steps. Click on "Educational Version of Market Insight." Enter your Site ID and click on "Login." Click on "Company." In the box marked "Ticker" enter BA and click on *"Go!"* Under Compustat Reports click on "Financial Hits." This brings up a file that contains the relevant data. Repeat this process using the ticker TXN.

24. What is the difference between a Eurobond and a foreign bond?

25. How are Brady bonds created?

End of Chapter 6 Problems
Answer Section

NUMERIC RESPONSE

1. ANS:
   a. The Ask price is \$10,000 132 26/32% = \$13,281.25
   b. The Bid price is \$10,000 100 20/32% = \$10,062.50

   PTS: 1
2. ANS:
   a. September 30, 2007 to July 31, 2008 is 0.8328 years. Thus,

   $$V_b = (5.00\%/2)\ (PVIFA_{4.10\%/2,\ 0.8328(2)}) + 100\%\ (PVIF_{4.10\%/2,\ 0.8328(2)}) = 100.7295\%$$

   or to the nearest 1/32% = 100-23%

   b. September 30, 2007 to February 15, 2014 is 6.37808 years. Also, 98:05 = 98.15625%. Thus,

   $$98.15625\% = (4.00\%/2)\ (PVIFA_{\text{Asked yield}/2,\ 6.37808(2)}) + 100\%\ (PVIF_{\text{Asked yield}/2,\ 6.37808(2)})$$

   Solving for Asked yield, we get 4.33%

   b. September 30, 2007 to February 15, 2014 is 6.46552 years. Also, 98:05 = 98.15625%. Thus,

   $$98.15625\% = (4.00\%/2)\ (PVIFA_{\text{Asked yield}/2,\ 6.46552(2)}) + 100\%\ (PVIF_{\text{Asked yield}/2,\ 6.46552(2)})$$

   Solving for Asked yield, we get 4.33%

   PTS: 1
3. ANS:
   a. September 30, 2007 to August 15, 2009 is 1.88219 years. Also, the Asked price is 92.923%. Thus,

   $$92.932\% = 100\%/\ (1 + \text{Asked yield}/2)^{2x1.88219}$$

   Solving for Asked yield, we get 3.94%

   b. September 30, 2007 to February 15, 2016 is 8.36885 years. Thus,

   $$V_b = 100\%/\ (1 + 4.54\%/2)^{2 \times 1.37217} = 68.681\%$$

   PTS: 1

4. ANS:
   a. Accrued interest over the 145 days is calculated as:
   (4.375%/2) ✋ 145/184 = 1.723845%
   of the face value of the bond, or $172.38 per $10,000 face value bond.

   b. Clean price + Accrued interest = Dirty price
   105.25% + 1.723845% = 106.973845%
   of the face value of the bond, or $10,697.3845 per $10,000 face value bond.

   c. $105.25\% = (4.375\%/2)\ (PVIFA_{ytm/2,\ 10.8603(2)}) + 100\%(PVIF_{ytm/2,\ 10.8603(2)})$

   Solving for the yield to maturity, we get 3.78%.

   PTS: 1
5. ANS:
   a. The inflation-adjusted principal at the end of the first six months June 30, 2011, is found by multiplying the original par value ($100,000) by the semiannual inflation rate. Thus, is adjusted upward by 0.3 percent (e.g., $100,000 x 1.003), or to $100,300. Therefore, the first coupon payment, paid on June 30, 2011, is $4,012 ($100,300 x 4.0%).

   b. The principal amount used to determine the second coupon payment is adjusted upward by 1 percent (e.g., $100,300 x 1.01), or to $101,303. The coupon payment to the investor for the second six month period is the inflation-adjusted principal on this coupon payment date ($101,304) times the semiannual coupon rate (4 percent). Or on December 31, 2011, the investor receives a coupon payment of $4,052.12 ($101,303 x 4.0%).

   PTS: 1
6. ANS:
   If your marginal tax rate is 21 percent, the after-tax or equivalent tax exempt rate of return on the taxable bond is
   9.5% (1 - .21) = 7.50%

   The municipal that pays 7.75 percent is the better deal.

   PTS: 1
7. ANS:
   a If your marginal tax rate is 28 percent, the after-tax or equivalent tax exempt rate of return on the taxable bond is
   6.75%/(1 - .28) = 9.375%

   b. If your marginal tax rate is 21 percent, the after-tax or equivalent tax exempt rate of return on the taxable bond is
   6.75%/(1 - .21) = 8.554%

   PTS: 1

8. ANS:
a. The Illinois Municipal Electric Power Supply bonds had a coupon rate of 5.00%, their price was 103.004%, and the yield was 4.60%.

b. On September 26, 2007, the Maryland Transportation Authority bonds were selling at 97.353% - .469% = 96.884%

PTS: 1

9. ANS:
a. The price of AT&T bonds on September 28, 2007 was 102.849% of the face value of the bond.

b. The dollar volume of trading in General Electric=s bond maturing in 2013 was 107,302x$1000 or $107,302,000.

c. The price of IBM 3.8 percent bonds on September 27, 2007 was 99.549% + 0.172% = 99.721% of the face value of the bond.

PTS: 1

10. ANS:
EXCEL Problem: Bond value = 102-17%
Bond value = 103-03%
Bond value = 103-19%
Bond value = 104-14%

PTS: 1

11. ANS:
a. If a bond holder were to convert Hilton Hotels bonds into stock, each bond (worth $975.00) could by exchanged for 61.2983 shares of stock worth $15.90. The conversion value of the bonds is:

$15.90 ✗ 61.2983 = $974.50

b. The bonds are currently worth $975.00 per bond, while their conversion value is $974.5. Thus, there is virtually no difference in dollar value of the investment to the investor if he or she holds Hilton=s debt or its common stock equivalent.

PTS: 1

SHORT ANSWER

12. ANS:
Capital markets are markets that trade equity (stocks) and debt (notes, bonds, and mortgages) instruments with maturities of more than one year. Bonds are long term debt obligations issued by corporations and government units. Proceeds from a bond issue are used to raise funds to support long term operations of the issuer (e.g., for capital expenditure projects). In return for the investor's funds, bond issuers promise to pay a specified amount in the future on the maturity of the bond (the face value) plus coupon interest on the borrowed funds (the coupon rate times the face value of the bond). If the terms of the repayment are not met by the bond issuer, the bondholder (investor) has a claim on the assets of the bond issuer. Bond markets are markets in which bonds are issued and trade. They are used to assist in the transfer of funds from individuals, corporations, and government units with excess funds to corporations and government units in need of long term debt funding. Bond markets are traditionally classified into three types: Treasury notes and bonds, municipal bonds, and corporate bonds.

PTS: 1

13. ANS:
In contrast to T-bills which are sold on a discount basis from face value, T-notes and T-bonds pay coupon interest (semiannually). Further, T-bills have an original maturity of less than one year. Treasury notes have original maturities from 1 to 10 years, while T-bonds have original maturities from 10 to 30 years. T-notes and bonds are issued in minimum denominations of $1,000, where T-bills are issued in minimum denominations of no less than $10,000.

PTS: 1

14. ANS:
A STRIP is a Treasury security in which periodic coupon interest payments can be separated from each other and from the final principal payment. A STRIP effectively creates two securities, one for each interest payment and one for the final principal payment. STRIPs are attractive investments to investors who want to receive a certain amount at a specified time in the future and are not concerned about receiving current income. For example, STRIPs are used as investment securities for individual retirement accounts, Keogh Plans, and pension funds.

PTS: 1

15. ANS:
General obligation (GO) bonds are backed by the full faith and credit of the issuer, i.e., the state or local government promises to use all of its financial resources (e.g., its taxation powers) to repay the bond. GO bonds have neither specific assets pledged as collateral backing the bond nor a specific revenue source identified as a source of repayment of the bond□s principal and interest. Because the taxing authority of the government issuer is promised to ensure repayment, the issuance of new GO bonds generally requires local taxpayer approval. Possibly because of this requirement, and taxpayers reluctance to have their taxes increase, general obligation bonds represent a smaller portion of municipal bonds issued
Revenue bonds are sold to finance a specific revenue generating project and are backed by cash flows from that project. For example, a revenue bond may be issued to finance an extension of a state highway. To help pay off the interest and principal on that bond, tolls collected from the use of the highway may be pledged as collateral to pay off the bond. If the revenue from the project is insufficient to pay interest and retire the bonds on maturity as promised, general tax revenues may not be used to meet these payments. Instead, the revenue bond goes into default and bondholders are not paid. Thus, revenue bonds are generally riskier then GO bonds.
.

PTS: 1

16. ANS:
With bearer bonds, coupons are attached to the bond and the holder (bearer) at the time of the coupon payment gets the relevant coupon paid on presentation to the issuer. With a registered bond, the bondholder (or owner) is kept in an electronic record by the issuer and the coupon payments are mailed or wire transferred to the registered owner. Because of the lack of security with bearer bonds, they have largely been replace by registered bonds.

PTS: 1

17. ANS:
Most corporate bonds are term bonds meaning that the entire issue matures on a single date. Some corporate bonds and most municipals bonds, on the other hand, are serial bonds, meaning that the issue contains many maturity dates, with a portion of the issue paid off on each. The economic reason for this is that many issuers like to avoid a ✌crisis at maturity.✍ That is, rather than having to pay off one very large principal sum at a given time in the future (as with a term issue), many issuers like to stretch out the period over which principal payments are made☝especially if their earnings are quite volatile.

PTS: 1

18. ANS:
a. subordinated debenture
b. mortgage bond
c. subordinated debenture

PTS: 1

19. ANS:
Convertible bonds are bonds that may be exchanged for another security of the issuing firm (e.g., common stock) at the discretion of the bondholder. If the market value of the securities the bondholder receives with conversion exceeds the market value of the bond, the bondholder can return the bonds to the issuer in exchange for the new securities and make a profit. As a result, conversion is an attractive feature to bondholders. It gives the bondholder an investment opportunity that is not available with nonconvertible bonds. As a result, the yield on a convertible bond is lower than that on a nonconvertible bond.

PTS: 1

20. ANS:
A call provision allows the issuer to require the bondholder to sell the bond back to the issuer at a given (call) price usually set above the par value of the bond. The difference between the call price and the face value on the bond is the call premium. Bonds are usually called in when interest rates drop (and bond prices rise) so that the issuer can gain by calling in the old bonds (with higher coupon rates) and issuing new bonds (with lower coupon rates).

PTS: 1

21. ANS:
A sinking fund provision which is a requirement that the issuer retire a certain amount of the bond issue early over a number of years, especially as the bond approaches maturity. The bond issuer provides the funds to the trustee by making frequent payments to a so-called sinking fund. This sinking fund accumulates in value and is eventually used to retire the specified dollar amount either by purchasing them in the open market or by calling them.

PTS: 1

22. ANS:
Bonds rated Baa or better by Moody's and BBB or better by S&P are considered to be investment grade bonds. Financial institutions are generally prohibited by state and federal law from purchasing anything but investment grade bond securities. Bonds rated below Baa by Moody's and BBB by S&P are considered to be speculative grade bonds and are often termed junk bonds, or high-yield bonds.

PTS: 1

23. ANS:
The answer to this S&P question will vary depending on the date of the assignment.

PTS: 1

24. ANS:
Eurobonds are long term bonds issued and sold outside the country of the currency in which they are denominated (e.g., dollar denominated bonds issued in Europe or Asia). Foreign bonds are long term bonds issued by firms and governments outside of the issuer's home country and are usually denominated in the currency of the country in which they are issued, for example a Japanese company issuing a dollar-denominate public bond in the U.S. Foreign bonds were issued long before Eurodollars and, as a result, are frequently called traditional international bonds.

PTS: 1

25. ANS:
Brady bonds were created through IMF and central bank sponsored programs under which **U.S. and other banks exchanged their dollar loans for dollar bonds issued by the relevant countries. These bonds have a much longer maturity than that promised on the original loans and a lower promised original coupon (yield) than the interest rate on the original loan. In many cases, these bond principal and interest payments have been partially syndicated by U.S. banks as collateral. Once banks and other financial institutions have swapped loans for bonds, they can sell them on the secondary market.**

PTS: 1