Problem Set #11 

Solutions

1. Consider two bonds, A and B. Both bonds presently are selling at their par value of $1,000. Each pays interest of $120 annually. Bond A will mature in 5 years, while bond B will mature in 6 years. If the yields to maturity on the two bonds change from 12% to 14%, _________.

A. both bonds will increase in value but bond A will increase more than bond B
B. both bonds will increase in value but bond B will increase more than bond A
C. both bonds will decrease in value but bond A will decrease more than bond B
D. both bonds will decrease in value but bond B will decrease more than bond A

2. A callable bond pays annual interest of $60, has a par value of $1,000, matures in 20 years but is callable in 10 years at a price of $1,100, and has a value today of $1055.84. The yield to call on this bond is _________.

A. 6%
B. 6.58%
C. 7.2%
D. 8%

\[ 1,055.84 = \frac{60}{r} \left[ 1 - (1 + r)^{-10} \right] + \frac{1100}{(1 + r)^{10}}; \quad r = 6.00\% \]

Calculator entries are N = 10, PV = -1,055.84, PMT = 60, FV = 1,100, CPT I/Y \(\rightarrow 6\)
3. If you are holding a premium bond, you must expect a _______ each year until maturity. If you are holding a discount bond, you must expect a _______ each year until maturity. (In each case assume that the yield to maturity remains stable over time.)

A. capital gain; capital loss
B. capital gain; capital gain
C. capital loss; capital gain
D. capital loss; capital loss

4. A coupon bond that pays interest of 4% annually has a par value of $1,000, matures in 5 years, and is selling today at $785. The actual yield to maturity on this bond is _________.

A. 7.2%
B. 8.8%
C. 9.1%
D. 9.6%

\[
\text{r} = \frac{1000}{785} \left[ \frac{1 - (1 + r)^{-5}}{r} \right] + \frac{1000}{(1 + r)^5} \\
\text{r} = 9.62\%
\]

Calculator entries are N = 5, PV = -785, PMT = 40, FV = 1,000, CPT I/Y \rightarrow 9.62

5. You would typically find all but which one of the following in a bond contract?

A. A dividend restriction clause
B. A sinking fund clause
C. A requirement to subordinate any new debt issued
D. A price-earnings ratio
6. You buy a 10-year $1,000 par value zero-coupon bond priced to yield 6%. You do not sell the bond. If you are in a 28% tax bracket, you will owe taxes on this investment after the first year equal to ________.

A. $0  
B. $4.27  
C. $9.38  
D. $33.51

\[
\text{Taxes owed} = (\$591.90 - \$558.39) \times 0.28 = \$9.38
\]

7. You buy a bond with a $1,000 par value today for a price of $875. The bond has 6 years to maturity and makes annual coupon payments of $75 per year. You hold the bond to maturity, but you do not reinvest any of your coupons. What was your effective EAR over the holding period?

A. 10.4%  
B. 9.57%  
C. 7.45%  
D. 8.78%

\[
\text{Total value in 6 years} = 1,000 + 6 \times 75 = 1,450
\]

Calculator entries for EAR are N = 6, PV = -875, PMT = 0, FV = 1,450, CPT I/Y \(\rightarrow\) 8.78, or \((875)(1 + \text{EAR})^6 = 1,000 + (75)(6); \text{EAR} = 8.78\%\]
8. If the quote for a Treasury bond is listed in the newspaper as 99:08 bid, 99:11 ask, the actual price at which you can sell this bond given a $10,000 par value is _____________.

A. $9,828.12

B. $9,925

C. $9,934.37

D. $9,955.43

\[
\left(99 + \frac{08}{32}\right) \times \frac{10,000}{100} = $9,925.00
\]