

FIN 423 – Fall 2012
Answers to Exam 2 (Chapters 7 and 8)

Part 1- Multiple Choice Concept Questions (2 points each)

1. The duration of a bond is a function of the bond's
 - A. coupon rate.
 - B. time to maturity.
 - C. yield to maturity.
 - D. all of the above**
 - E. none of the above

2. The modified duration of a bond paying semiannual coupons is equal to its Macaulay duration
 - A. times the change in interest rate.
 - B. times (one plus the bond's yield to maturity).
 - C. divided by (one plus the bond's yield to maturity).
 - D. divided by (one minus the bond's yield to maturity).
 - E. none of the above**

Note: Modified duration equals to Macaulay duration divided by one plus half of YTM.

3. The curvature of the price-yield curve for a given bond is referred as the bond's
 - A. Macaulay duration
 - B. modified duration
 - C. convexity**
 - D. sensitivity
 - E. tangency

4. The dollar value of an 01 is related to the
 - A. change in yield to call due to passage of one year
 - B. change in yield to maturity of one percent
 - C. change in yield to maturity of one basis point**
 - D. change in coupon rate of one percent
 - E. change in coupon rate of one basis point

5. Which statement is true for the Macaulay duration (in years) of a zero-coupon bond?
 - A. A zero-coupon bond does not have Macaulay duration because of the lack of coupons.
 - B. It is equal to the bond's maturity in years divided by its yield to maturity.
 - C. It is equal to the bond's maturity in years.**
 - D. It is equal to one-half the bond's maturity in years.
 - E. None of these statements is correct.

6. Which of the following are true about the interest-rate sensitivity of bonds?
- I. Bond prices and yields are inversely related.
 - II. Prices of long-term bonds tend to be more sensitive to interest rate changes than prices of short-term bonds.
 - III. The lower the bond's coupon rate, the lower the bond's price sensitivity to interest rate changes.
 - IV. The sensitivity of a bond's price to a change in its yield to maturity is inversely related to the yield to maturity at which the bond is currently selling.
- A. I and II only
 - B. I and III only
 - C. I, II, and IV only**
 - D. II, III, and IV only
 - E. I, II, III, and IV
7. Which one of the following is defined as the relationship between the interest rate on default-free, zero-coupon bonds and the time to maturity?
- A. discount rate curve
 - B. Treasury yield curve
 - C. risk premium structure
 - D. term structure of interest rates**
 - E. market interest rate curve
8. Zero-coupon bonds that are created by separating the interest and principal payments from U.S. Treasury bonds are called U.S. Treasury:
- A. notes.
 - B. bills.
 - C. STRIPS.**
 - D. SWAPS.
 - E. tax-exempts.
9. Which one of the following theories states that the term structure of interest rates reveals the financial market's projections of future interest rates?
- A. market rate theory
 - B. market yield theory
 - C. Fisher hypothesis
 - D. expectations theory**
 - E. rational rate hypothesis

10. Which one of the following is defined as a forward rate?
- A. rate agreed upon today for a long-term loan
 - B. interest rate quoted today which will apply to all loans made this week
 - C. interest rate on a loan made today that will vary as the market rate varies
 - D. interest rate adjusted for the anticipated rate of inflation
 - E. expected future interest rate implied by current interest rates**
11. Which one of the following features applies to a U.S. Treasury bill?
- A. U.S. agency debt
 - B. zero-coupon security**
 - C. taxable at the state level
 - D. semi-annual interest payments
 - E. annual interest payments
12. Based on expectations theory, the graphical representation of the term structure of interest rates will be _____ anytime investors believe that short-term interest rates will be higher in the future than they are today.
- A. humped
 - B. flat
 - C. downward sloping
 - D. upward sloping**
 - E. shifted downward

Part 2- Quantitative questions

Unless otherwise stated, all coupon payments are semiannual and all par values are \$100.

Please show your work to get credit.

- 13. A 5% bond with a yield to maturity of 6% that matures in 10 years. What is the price value of a basis point for this bond? (5 points)**

$$N = 20$$

$$PMT = (0.05 \times \$100) \div 2 = 2.5$$

$$I/Y = 3$$

$$FV = 100$$

$$CPT PV = -92.5613$$

$$\text{Price} = \$92.5613$$

If the yield increase by 1 bp from 6% to 6.01%:

$$I/Y = 3.005$$

$$CPT PV = -92.4903$$

$$\text{New price} = \$92.4903$$

Therefore, the price value of a basis point equals to $\$92.5613 - \$92.4903 =$ **\$0.7010**