Chapter 3 Understanding Interest Rates

3.1 Multiple Choice Questions

1) A loan that requires the borrower to make the same payment every period until the maturity date is called a
   A) simple loan.
   B) fixed-payment loan.
   C) discount loan.
   D) same-payment loan.
   E) none of the above.
   Answer: B

2) A coupon bond pays the owner of the bond
   A) the same amount every month until maturity date.
   B) the face value of the bond plus an interest payment once the maturity date has been reached.
   C) a fixed interest payment every period and repays the face value at the maturity date.
   D) the face value at the maturity date.
   E) none of the above.
   Answer: C

3) A credit market instrument that pays the owner the face value of the security at the maturity date and nothing prior to then is called a
   A) simple loan.
   B) fixed-payment loan.
   C) coupon bond.
   D) discount bond.
   Answer: D

4) (I) A simple loan requires the borrower to repay the principal at the maturity date along with an interest payment. (II) A discount bond is bought at a price below its face value, and the face value is repaid at the maturity date.
   A) (I) is true, (II) false.
   B) (I) is false, (II) true.
   C) Both are true.
   D) Both are false.
   Answer: C

5) Which of the following are true of coupon bonds?
   A) The owner of a coupon bond receives a fixed interest payment every year until the maturity date, when the face or par value is repaid.
   B) U.S. Treasury bonds and notes are examples of coupon bonds.
   C) Corporate bonds are examples of coupon bonds.
   D) All of the above.
   E) Only (A) and (B) of the above.
   Answer: D

6) Which of the following are generally true of all bonds?
   A) The longer a bond's maturity, the lower is the rate of return that occurs as a result of the increase in an interest rate.
   B) Even though a bond has a substantial initial interest rate, its return can turn out to be negative if interest rates rise.
   C) Prices and returns for long-term bonds are more volatile than those for shorter-term bonds.
   D) All of the above are true.
   E) Only (A) and (B) of the above are true.
   Answer: D

7) (I) A discount bond requires the borrower to repay the principal at the maturity date plus an interest payment. (II) A coupon bond pays the lender a fixed interest payment every year until the maturity date, when a specified final amount (face or par value) is repaid.
   A) (I) is true, (II) false.
   B) (I) is false, (II) true.
   C) Both are true.
   D) Both are false.
   Answer: B

8) If a $5,000 coupon bond has a coupon rate of 13 percent, then the coupon payment every year is
   A) $650.
   B) $1,300.
   C) $130.
   D) $13.
   E) None of the above.
   Answer: A

9) An $8,000 coupon bond with a $400 annual coupon payment has a coupon rate of
   A) 5 percent.
   B) 8 percent.
   C) 10 percent.
   D) 40 percent.
   Answer: A

10) The concept of _____ is based on the common-sense notion that a dollar paid to you in the future is less valuable to you than a dollar today.
A) present value
B) future value
C) interest
D) deflation
Answer: A

11) Dollars received in the future are worth _____ than dollars received today. The process of calculating what dollars received in the future are worth today is called _____
A) more; discounting.
B) less; discounting.
C) more; inflating.
D) less; inflating.
Answer: B

12) The process of calculating what dollars received in the future are worth today is called
A) calculating the yield to maturity.
B) discounting the future.
C) deflating the future.
D) none of the above.
Answer: B

13) With an interest rate of 5 percent, the present value of $100 received one year from now is approximately
A) $100.
B) $105.
C) $95.
D) $90.
Answer: C

14) With an interest rate of 10 percent, the present value of a security that pays $1,100 next year and $1,460 four years from now is
A) $1,000.
B) $2,560.
C) $3,000.
D) $2,000.
Answer: D

15) With an interest rate of 8 percent, the present value of $100 received one year from now is approximately
A) $108.
B) $100.
C) $96.
D) $93.
Answer: D

16) With an interest rate of 6 percent, the present value of $100 received one year from now is approximately
A) $106.
B) $100.
C) $94.
D) $92.
Answer: C

17) The interest rate that equates the present value of payments received from a debt instrument with its market price today is the
A) simple interest rate.
B) discount rate.
C) yield to maturity.
D) real interest rate.
Answer: C

18) The interest rate that financial economists consider to be the most accurate measure is the
A) current yield.
B) yield to maturity.
C) yield on a discount basis.
D) coupon rate.
Answer: B

19) Financial economists consider the _____ to be the most accurate measure of interest rates.
A) simple interest rate
B) discount rate
C) yield to maturity real interest rate
Answer: C

20) For a simple loan, the simple interest rate equals the
A) real interest rate.
B) nominal interest rate.
C) current yield.
D) yield to maturity.
Answer: D

21) For simple loans, the simple interest rate is _____ the yield to maturity.
A) greater than
B) less than
C) equal to
D) not comparable to
Answer: C

22) The yield to maturity of a one-year, simple loan of $500 that requires an interest payment of $40 is
A) 5 percent.
B) 8 percent.
C) 12 percent.
D) 12.5 percent.
Answer: B

23) The yield to maturity of a one-year, simple loan of $400 that requires an interest payment of $50 is
A) 5 percent.
B) 8 percent.
C) 12 percent.
D) 12.5 percent.
Answer: D

24) A $10,000, 8 percent coupon bond that sells for $10,000 has a yield to maturity of
A) 8 percent.
B) 10 percent.
C) 12 percent.
D) 14 percent.
Answer: A

25) Which of the following $1,000 face value securities has the highest yield to maturity?
A) A 5 percent coupon bond selling for $1,000
B) A 10 percent coupon bond selling for $1,000
C) A 12 percent coupon bond selling for $1,000
D) A 12 percent coupon bond selling for $1,100
Answer: C

26) Which of the following $1,000 face value securities has the highest yield to maturity?
A) A 5 percent coupon bond selling for $1,000
B) A 10 percent coupon bond selling for $1,000
C) A 15 percent coupon bond selling for $1,000
D) A 15 percent coupon bond selling for $900
Answer: D

27) Which of the following are true for a coupon bond?
A) When the coupon bond is priced at its face value, the yield to maturity equals the coupon rate.
B) The price of a coupon bond and the yield to maturity are negatively related.
C) The yield to maturity is greater than the coupon rate when the bond price is below the par value.
D) All of the above are true.
E) Only (A) and (B) of the above are true.
Answer: D

28) Which of the following are true for a coupon bond?
A) When the coupon bond is priced at its face value, the yield to maturity equals the coupon rate.
B) The price of a coupon bond and the yield to maturity are negatively related.
C) The yield to maturity is greater than the coupon rate when the bond price is above the par value.
D) All of the above are true.
E) Only (A) and (B) of the above are true.
Answer: E

29) Which of the following are true for a coupon bond?
A) When the coupon bond is priced at its face value, the yield to maturity equals the coupon rate.
B) The price of a coupon bond and the yield to maturity are positively related.
C) The yield to maturity is greater than the coupon rate when the bond price is above the par value.
D) All of the above are true.
E) Only (A) and (B) of the above are true.
Answer: A

30) The yield to maturity on a consol bond that pays $100 yearly and sells for $500 is
A) 5 percent.
B) 10 percent.
C) 12.5 percent.
D) 20 percent.
E) 25 percent.
Answer: D

31) The yield to maturity on a consol bond that pays $200 yearly and sells for $1000 is
A) 5 percent.
B) 10 percent.
C) 20 percent.
D) 25 percent.
Answer: C

32) The yield to maturity for a one-year discount bond equals
A) the increase in price over the year, divided by the initial price.
B) the increase in price over the year, divided by the face value.
C) the increase in price over the year, divided by the interest rate.
D) none of the above.
Answer: A

33) If a $10,000 face value discount bond maturing in one year is selling for $8,000, then its yield to maturity is
A) 10 percent.
B) 20 percent.
C) 25 percent.
D) 40 percent.
Answer: C

34) If a $10,000 face value discount bond maturing in one year is selling for $9,000, then its yield to maturity is
A) 9 percent.
B) 10 percent.
C) 11 percent.
D) 12 percent.
Answer: C

35) If a $10,000 face value discount bond maturing in one year is selling for $5,000, then its yield to maturity is
A) 5 percent.
B) 10 percent.
C) 50 percent.
D) 100 percent.
Answer: D

36) If a $5,000 face value discount bond maturing in one year is selling for $5,000, then its yield to maturity is
A) 0 percent.
B) 5 percent.
C) 10 percent.
D) 20 percent.
Answer: A

37) Which of the following are true for the current yield?
A) The current yield is defined as the yearly coupon payment divided by the price of the security.
B) The formula for the current yield is identical to the formula describing the yield to maturity for a discount bond.
C) The current yield is always a poor approximation for the yield to maturity.
D) All of the above are true.
E) Only (A) and (B) of the above are true.
Answer: A

38) The nearer the bond's price is to the bond's par value and the longer the maturity of the bond the more closely _____ approximates _____
A) current yield; yield to maturity.
B) current yield; coupon rate.
C) yield to maturity; current yield.
D) yield to maturity; coupon rate.
Answer: A

39) Which of the following are true for the current yield?
A) The current yield is defined as the yearly coupon payment divided by the price of the security.
B) The current yield and the yield to maturity always move together.
C) The formula for the current yield is identical to the formula describing the yield to maturity for a discount bond.
D) All of the above are true.
E) Only (A) and (B) of the above are true.
Answer: E

40) The current yield is a less accurate measure of the yield to maturity the _____ the time to maturity of the bond and the _____ the price is from/to the par value.
A) shorter; closer
B) shorter; farther
C) longer; closer
D) longer; farther
Answer: B

41) The current yield on a $6,000, 10 percent coupon bond selling for $5,000 is
A) 5 percent.
B) 10 percent.
C) 12 percent.
D) 15 percent.
Answer: C

42) The current yield on a $5,000, 8 percent coupon bond selling for $4,000 is
A) 5 percent.
B) 8 percent.
C) 10 percent.
D) 20 percent.
E) none of the above.
Answer: C

43) For a consol, the current yield is an _____ of the yield to maturity.
A) underestimate
B) overestimate
C) exact measure
D) approximate measure
Answer: C

44) Which of the following are true of the yield on a discount basis as a measure of the interest rate?
A) It uses the percentage gain on the face value of the security, rather than the percentage gain on the purchase price of the security.
B) It puts the yield on the annual basis of a 360-day year.
C) It ignores the time to maturity.
D) All of the above are true.
E) Only (A) and (B) of the above are true.
Answer: E

45) The formula for the measure of the interest rate called the yield on a discount basis is peculiar because
A) it uses the percentage gain on the face value of the bill, rather than the percentage gain on the purchase price of the bill.
B) it ignores the time to maturity.
C) it puts the yield on the annual basis of a 360-day year.
D) both (A) and (B) of the above.
E) both (A) and (C) of the above.
Answer: E

46) The yield on a discount basis of a 180-day $1,000 Treasury bill selling for $950 is
A) 10 percent.
B) 20 percent.
C) 25 percent.
D) 40 percent.
Answer: A

47) The yield on a discount basis of a 90-day $1,000 Treasury bill selling for $950 is
A) 5 percent.
B) 10 percent.
C) 15 percent.
D) 20 percent.
E) none of the above.
Answer: D

48) The yield on a discount basis of a 90-day $1,000 Treasury bill selling for $900 is
A) 10 percent.
B) 20 percent.
C) 25 percent.
D) 40 percent.
Answer: D

49) The yield on a discount basis of a 180-day $1,000 Treasury bill selling for $900 is
A) 10 percent.
B) 20 percent.
C) 25 percent.
D) 40 percent.
Answer: B

50) The Fisher equation states that
A) the nominal interest rate equals the real interest rate plus the expected rate of inflation.
B) the real interest rate equals the nominal interest rate less the expected rate of inflation.
C) the nominal interest rate equals the real interest rate less the expected rate of inflation.
D) both (A) and (B) of the above are true.
E) both (A) and (C) of the above are true.
Answer: D

51) If you expect the inflation rate to be 15 percent next year and a one-year bond has a yield to maturity of 7 percent, then the real interest rate on this bond is
A) 7 percent.
B) 22 percent.
C) -15 percent.
D) -8 percent.
E) none of the above.
Answer: D

52) If you expect the inflation rate to be 5 percent next year and a one-year bond has a yield to maturity of 7 percent, then the real interest rate on this bond is
A) -12 percent.
B) -2 percent.
C) 2 percent.
D) 12 percent.
Answer: C

53) The nominal interest rate minus the expected rate of inflation
A) defines the real interest rate.
B) is a better measure of the incentives to borrow and lend than is the nominal interest rate.
C) is a more accurate indicator of the tightness of credit market conditions than is the nominal interest rate.
D) indicates all of the above.
E) indicates only (A) and (B) of the above.
Answer: D

54) The nominal interest rate minus the expected rate of inflation
A) defines the real interest rate.
B) is a less accurate measure of the incentives to borrow and lend than is the nominal interest rate.
C) is a less accurate indicator of the tightness of credit market conditions than is the nominal interest rate.
D) defines the discount rate.
Answer: A

55) In which of the following situations would you prefer to be making a loan?
A) The interest rate is 9 percent and the expected inflation rate is 7 percent.
B) The interest rate is 4 percent and the expected inflation rate is 1 percent.
C) The interest rate is 13 percent and the expected inflation rate is 15 percent.
D) The interest rate is 25 percent and the expected inflation rate is 50 percent.
Answer: B

56) In which of the following situations would you prefer to be borrowing?
A) The interest rate is 9 percent and the expected inflation rate is 7 percent.
B) The interest rate is 4 percent and the expected inflation rate is 1 percent.
C) The interest rate is 13 percent and the expected inflation rate is 15 percent.
D) The interest rate is 25 percent and the expected inflation rate is 50 percent.
Answer: D

57) What is the return on a 5 percent coupon bond that initially sells for $1,000 and sells for $1,200 one year later?
A) 5 percent
B) 10 percent
C) -5 percent
D) 25 percent
E) None of the above
Answer: D

58) What is the return on a 5 percent coupon bond that initially sells for $1,000 and sells for $900 one year later?
A) 5 percent
B) 10 percent
C) -5 percent
D) -10 percent
E) None of the above
Answer: C

59) The return on a 5 percent coupon bond that initially sells for $1,000 and sells for $1,100 one year later is
A) 5 percent.
B) 10 percent.
C) 14 percent.
D) 15 percent.
Answer: D

60) The return on a 10 percent coupon bond that initially sells for $1,000 and sells for $900 one year later is
A) -10 percent.
B) -5 percent.
C) 0 percent.
D) 5 percent.
Answer: C

61) Which of the following are generally true of all bonds?
A) The only bond whose return equals the initial yield to maturity is one whose time to maturity is the same as the holding period.
B) A rise in interest rates is associated with a fall in bond prices, resulting in capital losses on bonds whose term to maturities are longer than the holding period.
C) The longer a bond's maturity, the greater is the size of the price change associated with an interest rate change.
D) All of the above are true.
E) Only (A) and (B) of the above are true.
Answer: D

62) Which of the following are true concerning the distinction between interest rates and return?
A) The rate of return on a bond will not necessarily equal the interest rate on that bond.
B) The return can be expressed as the sum of the current yield and the rate of capital gains.
C) The rate of return will be greater than the interest rate when the price of the bond falls between time t and time t+1.
D) All of the above are true.
E) Only (A) and (B) of the above are true.
Answer: E

63) If the interest rates on all bonds rise from 5 to 6 percent over the course of the year, which bond would you prefer to have been holding?
A) A bond with one year to maturity
B) A bond with five years to maturity
C) A bond with ten years to maturity
D) A bond with twenty years to maturity
Answer: A

64) Suppose you are holding a 5 percent coupon bond maturing in one year with a yield to maturity of 15 percent. If the interest rate on one-year bonds rises from 15 percent to 20 percent over the course of the year, what is the yearly return on the bond you are holding?
A) 5 percent
B) 10 percent
C) 15 percent
D) 20 percent
Answer: C

65) (I) Prices of longer-maturity bonds respond more dramatically to changes in interest rates. (II) Prices and returns for long-term bonds are less volatile than those for short-term bonds.
A) (I) is true, (II) false.
B) (I) is false, (II) true.
C) Both are true.
D) Both are false.
Answer: A

66) (I) Prices of longer-maturity bonds respond less dramatically to changes in interest rates. (II) Prices and returns for long-term bonds are less volatile than those for shorter-term bonds.
A) (I) is true, (II) false.
B) (I) is false, (II) true.
C) Both are true.
D) Both are false.
Answer: D

67) The riskiness of an asset's return that results from interest rate changes has been given the special name of
A) interest-rate risk.
B) liquidity risk.
C) bond-market risk.
D) yield-to-maturity risk.
Answer: A

68) If an investor's holding period is longer than the term to maturity of a bond, the investor is exposed to
A) interest-rate risk.
B) reinvestment risk.
C) bond-market risk.
D) yield-to-maturity risk.
Answer: B

69) (I) The average lifetime of a debt security's stream of payments is called duration. (II) The duration of a portfolio is the weighted average of the durations of the individual securities, with the weights reflecting the proportion of the portfolio invested in each.
A) (I) is true, (II) false.
B) (I) is false, (II) true.
C) Both are true
D) Both are false.
Answer: C

70) The duration of a ten-year, 10 percent coupon bond when the interest rate is 10 percent is 6.76 years. What happens to the price of the bond if the interest rate falls to 8 percent?
A) it rises 20 percent
B) it rises 12.3 percent
C) it falls 20 percent
D) it falls 12.3 percent
Answer: B

3.2 True/False

1) A bond's current market value is equal to the present value of the coupon payments plus the present value of the face amount.
Answer: TRUE

2) The current yield is the best measure of an investor's return from holding a bond.
Answer: FALSE

3) Unless a bond defaults, an investor cannot lose money investing in bonds.
Answer: FALSE

4) The current yield is the yearly coupon rate divided by the current market price.
Answer: TRUE

5) Prices for long-term bonds are more volatile than for shorter-term bonds.
Answer: TRUE

6) A long-term bond's price is less affected by interest rate movements than is a short-term bond's price.
Answer: FALSE

7) Increasing duration implies that interest rate risk has increased.
Answer: TRUE

8) All else being equal, the greater the interest rate the greater is the duration.
Answer: FALSE

9) The real rate is equal to the nominal rate plus inflation.
Answer: FALSE

10) The current yield goes up as the yield to maturity on a bond falls.
Answer: FALSE

3.3 Essay

1) Distinguish between interest rates, yield to maturity, and current yield.

2) Describe the cash flows received from ownership of a coupon bond. What are the sources of income?

3) What concept is used to value a bond?

4) Why are long-term bonds more risky than short-term bonds?

5) What is interest rate risk and how is it measured?

6) Why may a bond's rate of return differ from its yield to maturity?

7) How does reinvestment risk differ from interest rate risk?