Dr. A. Frank Thompson<br>Coverage: Valuation of Stocks and Bonds, Discounted Cash Flow Valuation, and Long Term Debt Characteristics. Please choose the best possible answer to the following questions. Completed exams and scan sheets will be due at the beginning of class on March 7, 2011.

## True/False

Indicate whether the statement is true or false.
$\qquad$ 1. Suppose an investor plans to invest a given sum of money. She can earn an effective annual rate of $5 \%$ on Security A, while Security B will provide an effective annual rate of $12 \%$. Within 11 years' time, the compounded value of Security B will be more than twice the compounded value of Security A. (Ignore risk, and assume that compounding occurs daily.)
2. A bond that had a 20 -year original maturity with 1 year left to maturity has more interest rate price risk than a 10 -year original maturity bond with 1 year left to maturity. (Assume that the bonds have equal default risk and equal coupon rates, and they cannot be called.)
3. The cash flows associated with common stock are more difficult to estimate than those related to bonds because stocks only have residual claims against the company.
4. A call provision gives bondholders the right to demand, or "call for," repayment of a bond. Typically, calls are exercised if interest rates rise, because when rates rise the bondholder can get the principal amount back and reinvest it elsewhere at higher rates.
5. Sinking funds are devices used to force companies to retire bonds on a scheduled basis prior to their maturity. Many bond indentures allow the company to acquire bonds for a sinking fund by either purchasing bonds in the market or selecting the bonds to be acquired by a lottery administered by the trustee through a call at face value.
6. For bonds, price sensitivity to a given change in interest rates is generally greater the longer before the bond matures.
7. As a general rule, a company's debentures have higher required interest rates than its mortgage bonds because mortgage bonds are backed by specific assets while debentures are unsecured.

## Multiple Choice

Identify the choice that best completes the statement or answers the question.
$\qquad$ 8. You are analyzing the value of a potential investment by calculating the sum of the present values of its expected cash flows. Which of the following would lower the calculated value of the investment?
a. The cash flows are in the form of a deferred annuity, and they total to $\$ 100,000$. You learn that the annuity lasts for only 5 rather than 10 years, hence that each payment is for $\$ 20,000$ rather than for $\$ 10,000$.
b. The discount rate increases.
c. The riskiness of the investment's cash flows decreases.
d. The total amount of cash flows remains the same, but more of the cash flows are received in the earlier years and less are received in the later years.
e. The discount rate decreases.
9. Which of the following bank accounts has the highest effective annual return?
a. An account that pays $8 \%$ nominal interest with monthly compounding.
b. An account that pays $8 \%$ nominal interest with annual compounding.
c. An account that pays $7 \%$ nominal interest with daily (365-day) compounding.
d. An account that pays $7 \%$ nominal interest with monthly compounding.
e. An account that pays $8 \%$ nominal interest with daily ( 365 -day) compounding.
10. A Treasury bond promises to pay a lump sum of $\$ 1,000$ exactly 3 years from today. The nominal interest rate is $6 \%$, semiannual compounding. Which of the following statements is CORRECT?
a. The periodic interest rate is greater than $3 \%$.
b. The periodic rate is less than $3 \%$.
c. The present value would be greater if the lump sum were discounted back for more periods.
d. The present value of the $\$ 1,000$ would be smaller if interest were compounded monthly rather than semiannually.
e. The PV of the $\$ 1,000$ lump sum has a higher present value than the PV of a 3-year, $\$ 333.33$ ordinary annuity.
11. Last year Toto Corporation's sales were $\$ 225$ million. If sales grow at $6 \%$ per year, how large (in millions) will they be 5 years later?
a. $\$ 271.74$
b. $\$ 286.05$
c. $\$ 301.10$
d. $\$ 316.16$
e. $\$ 331.96$
12. Suppose the U.S. Treasury offers to sell you a bond for $\$ 747.25$. No payments will be made until the bond matures 5 years from now, at which time it will be redeemed for $\$ 1,000$. What interest rate would you earn if you bought this bond at the offer price?
a. $4.37 \%$
b. $4.86 \%$
c. $5.40 \%$
d. $6.00 \%$
e. $6.60 \%$
13. Ten years ago, Levin Inc. earned $\$ 0.50$ per share. Its earnings this year were $\$ 2.20$. What was the growth rate in Levin's earnings per share (EPS) over the 10-year period?
a. $15.17 \%$
b. $15.97 \%$
c. $16.77 \%$
d. $17.61 \%$
e. $18.49 \%$
14. An investment promises the following cash flow stream: $\$ 750$ at Time $0 ; \$ 2,450$ at the end of Year 1 (or at $\mathrm{t}=$ 1); $\$ 3,175$ at the end of Year 2; and $\$ 4,400$ at the end of Year 3. At a discount rate of $8.0 \%$, what is the present value of the cash flow stream?
a. $\$ 7,916.51$
b. $\$ 8,333.17$
c. $\$ 8,771.76$
d. $\$ 9,233.43$
e. $\$ 9,695.10$
15. Your uncle has $\$ 300,000$ invested at $7.5 \%$, and he now wants to retire. He wants to withdraw $\$ 35,000$ at the end of each year, beginning at the end of this year. He also wants to have $\$ 25,000$ left to give you when he ceases to withdraw funds from the account. For how many years can he make the $\$ 35,000$ withdrawals and still have $\$ 25,000$ left in the end?
a. $\quad 14.21$
b. 14.96
c. $\quad 15.71$
d. $\quad 16.49$
e. $\quad 17.32$
16. Your uncle has $\$ 300,000$ invested at $7.5 \%$, and he now wants to retire. He wants to withdraw $\$ 35,000$ at the beginning of each year, beginning immediately. He also wants to have $\$ 25,000$ left to give you when he ceases to withdraw funds from the account. For how many years can he make the $\$ 35,000$ withdrawals and still have $\$ 25,000$ left in the end?
a. 11.98
b. 12.61
c. $\quad 13.27$
d. 13.94
e. 14.63
17. Suppose you are buying your first house for $\$ 210,000$, and are making a $\$ 20,000$ down payment. You have arranged to finance the remaining amount with a 30 -year, monthly payment, amortized mortgage at a $6.5 \%$ nominal interest rate. What will your equal monthly payments be?
a. $\$ 1,083.84$
b. $\$ 1,140.88$
c. $\$ 1,200.93$
d. $\$ 1,260.98$
e. $\$ 1,324.02$
18. You decide to purchase a $\$ 210,000$ home making a $\$ 20,000$ downpayment. You secure a $6.5 \%$ fixed rate, 30 year mortgage on the balance. 10 years later when interest rates have dropped to $5 \%$, you decide to refinance. What is the amount of the outstanding loan balance at the time of refinancing?
a. $\$ 161,074.74$
b. $\$ 130,258.90$
c. $\$ 154,293.17$
d. $\$ 134,287.14$
19. Your company has just taken out a 1 -year installment loan for $\$ 72,500$. The nominal rate is $12.0 \%$, but with equal end-of-month payments. What percentage of the 2nd monthly payment will go toward the repayment of principal?
a. $73.01 \%$
b. $76.85 \%$
c. $80.89 \%$
d. $85.15 \%$
e. $89.63 \%$
20. Which of the following events would make it more likely that a company would choose to call its outstanding callable bonds?
a. The company's bonds are downgraded.
b. Market interest rates rise sharply.
c. Market interest rates decline sharply.
d. The company's financial situation deteriorates significantly.
e. Inflation increases significantly.
21. Which of the following bonds would have the greatest percentage increase in value if all interest rates fall by $1 \%$ ?
a. 10-year, zero coupon bond.
b. 20-year, $10 \%$ coupon bond.
c. 20 -year, $5 \%$ coupon bond.
d. 1-year, $10 \%$ coupon bond.
e. 20-year, zero coupon bond.
22. 1. In 1981, when interest rates were at $13.5 \%$ on U.S. long term bonds, and gas prices were at all time highs, you decided to invest in gold as a store of value. You purchased 10 gold 1 oz . Kugerrands for $\$ 475$ each. In 2008, some 27 years later, when gas prices were once again reaching all time highs, but interest rates on U.S. long term bonds were near a record low of $4 \%$, you sell the gold Kugerrands at $\$ 900$ a piece. Ignoring commissions, and storage fees, what was your return on investment from this activity?
a. $13.5 \%$
b. $7.125 \%$
c. $5.065 \%$
d. $2.395 \%$
23. In 1981, when interest rates were $13.5 \%$ on long term bonds, you decided to purchase a $\$ 5,000$ bond that produced $\$ 500$ a year in interest, and just matured this year $\$ 5,000$. Back in 1981, 27 years ago, you purchased this bond at a discounted price of $\$ 4,750$. Ignoring commissions, what was your rate of return on this investment?
a. $10.566 \%$
c. $5.231 \%$
b. 7.025\%
d. $2.395 \%$
24. In 1981, when interest rates, gas prices and unemployment were high, and the stock market was falling, you decided to purchase 100 shares of GE stock at $\$ 47.50$ per share. Over the next 27 years, GE stock split 2 for 1 in 1994, 2 for 1 in 1997 and 3 for 1 in 2000. So in 2008, from the 100 shares purchased in 1981 you now have 1200 shares of GE. During this same period GE produced a small dividend with a yield of average of $2.5 \%$, so for simplicity, assume that each year you received $\$ 118.75$ [which is somewhat understated because GE dividends were increased periodically] on your GE stock holding. If you sold all your GE shares today at $\$ 33.50$ per share, what would have been your rate of return on investment?
a. $10.566 \%$
b. $9.355 \%$
c. $7.025 \%$
d. $2.395 \%$
25. In 1998 , the business school of $U$ and I received a donation of $\$ 100,000$ from the Go Gently into that Good Night Fast Food Chain to allow students, with the help of some remarkable CFA advisors to invest in the market. The results of this investment activity were kept secret for 9 years, but in 2007 a faculty member asked for a report on the value of the fund. The faculty member argued that trust funds, pension plans, insurance companies and other fiduciaries were required to report their results periodically, why should a university fund designed to teach students about investing be exempt? Finally, it was reported that in 2007 the investment fund stood at $\$ 126,000$. What was the return on investment in this fund?
a. $6.234 \%$
b. $5.012 \%$
c. $2.601 \%$
d. $2.395 \%$
26. In 1998, a secretary in the provost's office of $U$ and I received a $\$ 100,000$ inheritance from her long lost cousin. She decided to invest the $\$ 100,000$ in a par value $\$ 100,000$ Wells Fargo bond paying $4.75 \%$ or $\$ 4750$ a year in annual interest. If the bond matures in 2007 , what was her return on investment?
a. $5 \%$
b. $4.75 \%$
c. $2.601 \%$
d. $2.395 \%$
27. In 1998, you receive a $\$ 100,000$ inheritance. Noting that the internet bubble is bursting and everyone wants to get out of technology, you decide to purchase 2000 shares of Intel at $\$ 16 /$ share, 1000 shares of Cisco at $\$ 17 /$ share and 1000 shares of Microsoft at $\$ 25 /$ share. The total cost of this investment ignoring commissions is $\$ 74,000$ leaving a cash position of $\$ 26,000$ [ $26 \%$ of the portfolio]. If you liquidate the position in 2007, the stock prices are as follows: Intel - $\$ 32 /$ share; Cisco - \$26/share; Microsoft - \$30/share. During this 9 year period these companies paid small dividends which will be ignored for simplicity. Also, there was small amount of annual interest on $\$ 26,000$ cash position. Assume that the cash position accumulated interest at $4 \%$ compounded annually. Based on the capital appreciation of the securities and the interest on cash, what was the rate of return on this portfolio?
a. $5.14 \%$
b. $4.75 \%$
c. $7.025 \%$
d. $8.346 \%$
28. Jersey City Trucking is financing a new truck with a loan of $\$ 10,000$ to be repaid in annual end-of-year installments of $\$ 2,504.56$. What annual interest rate is the company paying?
a. $7 \%$
b. $8 \%$
c. $9 \%$
d. $10 \%$
29. Your Cedar Falls lease provides for payments of $\$ 500$ at the end of each month for the next 12 months. However, your landlord offers you a new 1 -year lease arrangement that calls for zero rent for the next 3 months, then rental payments of $\$ 700$ at the end of each month for the next 9 months. You keep you money in a local bank savings account that pays a nominal annual rate of $5 \%$. By what amount would you be saving if you accepted the new lease over the old one?
a. $\quad \$ 253.62$ the new lease is less favorable
b. $+\$ 135.24$
c. +253.62
d. $-\$ 509.81$
30. In order to determine the capital structure of ABC Finance, it is necessary to convert its balance sheet figures to a market value basis. The right hand side of ABC's balance sheet as of today, February 24, 2008, is as follows:
Long-term debt (bonds, at par)
$\$ 10$ million
Preferred Stock
Common Stock (\$10 par)
Retained Earnings
Total Liabilities and Net Worth
\$ 2 million \$ 10 million
\$ 4 million
$\$ 26$ million

ABC's bonds have a $4 \%$ coupon rate, are payable semiannually, and carry a par value of $\$ 1,000$. They are set to mature on February 24, 2018. The yield to maturity is $12 \%$. What is the current market value of the firm's debt?
a. $\$ 5,412,000$
b. $\$ 5,237,102$
c. $\$ 5,062,104$
d. $\$ 5,183,291$
31. The expected return on Northeast Corporation's stock is $14 \%$. The stock's dividend is expected to grow at a constant rate of $8 \%$, and it currently sells for $\$ 50$ a share. Which of the following statements is CORRECT?
a. The stock's dividend yield is $7 \%$.
b. The stock's dividend yield is $8 \%$.
c. The current dividend per share is $\$ 4.00$.
d. The stock price is expected to be $\$ 54$ a share one year from now.
e. The stock price is expected to be $\$ 57$ a share one year from now.
32. A stock is expected to pay a dividend of $\$ 0.75$ at the end of the year. The required rate of return is $r_{s}=12.5 \%$, and the expected constant growth rate is $\mathrm{g}=8.5 \%$. What is the current stock price?
a. $\quad \$ 17.82$
b. $\$ 18.28$
c. $\quad \$ 18.75$
d. $\$ 19.22$
e. $\$ 19.70$
33. If $\mathrm{D}_{1}=\$ 1.75, \mathrm{~g}$ (which is constant) $=4.5 \%$, and $\mathrm{P}_{0}=\$ 46$, what is the stock's expected dividend yield for the coming year?
a. $3.26 \%$
b. $3.43 \%$
c. $3.61 \%$
d. $3.80 \%$
e. $3.99 \%$

