Multiple Choice Questions:

I.   DEFINITIONS

OPTIONS

a   1.   A financial contract that gives its owner the right, but not the obligation, to buy or sell a specified asset at an agreed-upon price on or before a given future date is called a(n) _____ contract.
   a.   option
   b.   futures
   c.   forward
   d.   swap
   e.   straddle

   Difficulty level: Easy

OPTION EXERCISE

b   2.   The act where an owner of an option buys or sells the underlying asset, as is his right, is called _____ the option.
   a.   striking
   b.   exercising
   c.   opening
   d.   splitting
   e.   strangling

   Difficulty level: Easy

STRIKE PRICE

c   3.   The fixed price in an option contract at which the owner can buy or sell the underlying asset is called the option's:
   a.   opening price.
   b.   intrinsic value.
   c.   strike price.
   d.   market price.
   e.   time value.

   Difficulty level: Easy

EXPIRATION DATE

d   4.   The last day on which an owner of an option can elect to exercise is the _____ date.
   a.   ex-payment
   b.   ex-option
   c.   opening
   d.   expiration
   e.   intrinsic

   Difficulty level: Easy

AMERICAN OPTIONS

e   5.   An option that may be exercised at any time up its expiration date is called a(n) _____
        option.
        a.   futures
        b.   Asian
        c.   Bermudan
        d.   European
        e.   American

Difficulty level: Easy

EUROPEAN OPTIONS

a   6.   An option that may be exercised only on the expiration date is called a(n) _____
        option.
        a.   European
        b.   American
        c.   Bermudan
        d.   futures
        e.   Asian

Difficulty level: Easy

CALL OPTION

b   7.   A _____ is a derivative security that gives the owner the right, but not the obligation,
        to buy an asset at a fixed price for a specified period of time.
        a.   futures contract
        b.   call option
        c.   put option
        d.   swap
        e.   forward contract

Difficulty level: Easy

PUT OPTION

c   8.   A _____ is a derivative security that gives the owner the right, but not the obligation,
        to sell an asset at a fixed price for a specified period of time.
        a.   futures contract
        b.   call option
        c.   put option
        d.   swap
        e.   forward contract

Difficulty level: Easy

ARBITRAGE

d 9. A trading opportunity that offers a riskless profit is called a(n):
   a. put option.
   b. call option.
   c. market equilibrium.
   d. arbitrage.
   e. cross-hedge.

Difficulty level: Easy

INTRINSIC VALUE

e 10. The value of an option if it were to immediately expire, that is, its lower pricing
       bound, is called an option's _____ value.
   a. strike
   b. market
   c. volatility
   d. time
   e. intrinsic

Difficulty level: Easy

PUT-CALL PARITY

a 11. The relationship between the prices of the underlying stock, a call option, a put option, and a
       riskless asset is referred to as the _____ relationship.
   a. put-call parity
   b. covered call
   c. protective put
   d. straddle
   e. strangle

Difficulty level: Medium

OPTION DELTA

d 12. The effect on an option's value of a small change in the value of the underlying asset is called
       the option:
   a. theta.
   b. vega.
   c. rho.
   d. delta.
   e. gamma.

Difficulty level: Medium

PUT OPTION

d   13.   An option that grants the right, but not the obligation, to sell shares of the underlying asset on a particular date at a specified price is called:

    a.   either an American or a European option.
    b.   an American call.
    c.   an American put.
    d.   a European put.
    e.   a European call.

Difficulty level: Medium

PUT OPTION

c   14.   Which one of the following provides the option of selling a stock anytime during the option period at a specified price even if the market price of the stock declines to zero?

    a.   American call
    b.   European call
    c.   American put
    d.   European put
    e.   either an American or a European put

Difficulty level: Medium

PUT-CALL PARITY

e   15.   Given an exercise price E, time to maturity T and European put-call parity, the present value of the strike price E plus the call option is equal to:

    a.   the current market value of the stock.
    b.   the present value of the stock minus a put option.
    c.   a put option minus the market value of the share of stock.
    d.   the value of a U.S. Treasury bill.
    e.   the share of stock plus the put option.

Difficulty level: Medium

PUT-CALL PARITY

c   16.   You can realize the same value as that derived from stock ownership if you:

    a.   sell a put option and invest at the risk-free rate of return.
    b.   buy a call option and write a put option on a stock and also lend out funds at the risk-free rate.
    c.   sell a put and buy a call on a stock as well as invest at the risk-free rate of return.
    d.   lend out funds at the risk-free rate of return and sell a put option on the stock.
    e.   borrow funds at the risk-free rate of return and invest the proceeds in equivalent amounts of put and call options.

Difficulty level: Medium

II. CONCEPTS

AMERICAN OPTIONS

e   17.   Which one of the following statements correctly describes your situation as the owner of an American call option?
   a.   You are obligated to buy at a set price at any time up to and including the expiration date.
   b.   You have the right to sell at a set price at any time up to and including the expiration date.
   c.   You have the right to buy at a set price only on the expiration date.
   d.   You are obligated to sell at a set price if the option is exercised.
   e.   You have the right to buy at a set price at any time up to and including the expiration date.

   Difficulty level: Medium

AMERICAN OPTIONS

c   18.   Jeff opted to exercise his August option on August 10 and received $2,500 in exchange for his shares. Jeff must have owned a (an):
   a.   warrant.
   b.   American call.
   c.   American put.
   d.   European call.
   e.   European put.

   Difficulty level: Medium

EUROPEAN OPTIONS

a   19.   Jillian owns an option which gives her the right to purchase shares of WAN stock at a price of $20 a share. Currently, WAN stock is selling for $24.50. Jillian would like to profit on this stock but is not permitted to exercise her option for another two weeks. Which of the following statements apply to this situation?
   I.   Jillian must own a European call option.
   II.   Jillian must own an American put option.
   III. Jillian should sell her option today if she feels the price of WAN stock will decline significantly over the next two weeks.
   IV.   Jillian cannot profit today from the price increase in WAN stock.
   a.   I and III only
   b.   II and IV only
   c.   I and IV only
   d.   II and III only
   e.   I, III, and IV only

   Difficulty level: Medium

EUROPEAN OPTIONS

e 20. The difference between an American call and a European call is that the American call:
   a. has a fixed exercise price while the European exercise price can vary within a small range.
   b. is a right to buy while a European call is an obligation to buy.
   c. has an expiration date while the European call does not.
   d. is written on 100 shares of the underlying security while the European call covers 1,000 shares.
   e. can be exercised at any time up to the expiration date while the European call can only be exercised on the expiration date.

Difficulty level: Medium

CALL EXPIRATION VALUE

d 21. If a call has a positive intrinsic value at expiration the call is said to be:
   a. funded.
   b. unfunded.
   c. at the money.
   d. in the money.
   e. out of the money.

Difficulty level: Medium

PUT EXPIRATION VALUE

e 22. A 35 put option on ABC stock expires today. The current price of ABC stock is $36. The put is:
   a. funded.
   b. unfunded.
   c. at the money.
   d. in the money.
   e. out of the money.

Difficulty level: Medium

CALL UPPER BOUND

d 23. The maximum value of a call option is equal to:
   a. the strike price minus the initial cost of the option.
   b. the exercise price plus the price of the underlying stock.
   c. the strike price.
   d. the price of the underlying stock.
   e. the purchase price.

Difficulty level: Medium

CALL LOWER BOUND

b   24.   The lower bound on a call's value is either the:
  a.   strike price or zero, whichever is greater.
  b.   stock price minus the exercise price or zero, whichever is greater.
  c.   strike price or the stock price, whichever is lower.
  d.   strike price or zero, whichever is lower.
  e.   stock price minus the exercise price or zero, whichever is lower.

Difficulty level: Medium

CALL LOWER BOUND

e   25.   The lower bound of a call option:
  a.   can be a negative value regardless of the stock or exercise prices.
  b.   can be a negative value but only when the exercise price exceeds the stock price.
  c.   can be a negative value but only when the stock price exceeds the exercise price.
  d.   must be greater than zero.
  e.   can be equal to zero.

Difficulty level: Medium

CALL INTRINSIC VALUE

e   26.   The intrinsic value of a call is:
  I.   the value of the call if it were about to expire.
  II.   equal to the lower bound of a call's value.
  III.   another name for the market price of a call.
  IV.   always equal to zero if the call is currently out of the money.
  a.   I and III only
  b.   II and IV only
  c.   I and II only
  d.   II, III, and IV only
  e.   I, II, and IV only

Difficulty level: Medium

PUT INTRINSIC VALUE

d   27.   The intrinsic value of a put is equal to the:
  a.   lesser of the strike price or the stock price.
  b.   lesser of the stock price minus the exercise price or zero.
  c.   lesser of the stock price or zero.
  d.   greater of the strike price minus the stock price or zero.
  e.   greater of the stock price minus the exercise price or zero.

Difficulty level: Medium

FACTORS AFFECTING OPTION VALUES

c   28.   Which of the following statements are correct concerning option values?
      I.   The value of a call increases as the price of the underlying stock increases.
      II.   The value of a call decreases as the exercise price increases.
      III.   The value of a put increases as the price of the underlying stock increases.
      IV.   The value of a put decreases as the exercise price increases.
      a.   I and III only
      b.   II and IV only
      c.   I and II only
      d.   II and III only
      e.   I, II, and IV only

      Difficulty level: Medium

FACTORS AFFECTING OPTION VALUES

e   29.   The value of a call increases when:
      I.   the time to expiration increases.
      II.   the stock price increases.
      III.   the risk-free rate of return increases.
      IV.   the volatility of the price of the underlying stock increases.
      a.   I and III only
      b.   II, III, and IV only
      c.   I, III, and IV only
      d.   I, II, and III only
      e.   I, II, III, and IV

      Difficulty level: Medium

FACTORS AFFECTING OPTION VALUES

d   30.   Which one of the following will cause the value of a call to decrease?
      a.   lowering the exercise price
      b.   increasing the time to expiration
      c.   increasing the risk-free rate
      d.   lowering the risk level of the underlying security
      e.   increasing the stock price

      Difficulty level: Medium

FACTORS AFFECTING OPTION VALUES

c   31.   Assume that you own both a May 40 put and a May 40 call on ABC stock. Which one of the following statements is correct concerning your option positions? Ignore taxes and transaction costs.
   a.   An increase in the stock price will increase the value of your put and decrease the value of your call.
   b.   Both a May 45 put and a May 45 call will have higher values than your May 40 options.
   c.   The time premiums on both your put and call are less than the time premiums on equivalent June options.
   d.   A decrease in the stock price will decrease the value of both of your options.
   e.   You cannot profit on your position as your profits on one option will be offset by losses on the other option.

Difficulty level: Medium

FACTORS AFFECTING OPTION VALUES

c   32.   You own both a May 20 call and a May 20 put. If the call finishes in the money, then the put will:
   a.   also finish in the money.
   b.   finish at the money.
   c.   finish out of the money.
   d.   either finish at the money or in the money.
   e.   either finish at the money or out of the money.

Difficulty level: Medium

EQUITY AS A CALL OPTION

e   33.   You own stock in a firm that has a pure discount loan due in six months. The loan has a face value of $50,000. The assets of the firm are currently worth $62,000. The stockholders in this firm basically own a _____ option on the assets of the firm with a strike price of:
   a.   put; $62,000.
   b.   put; $50,000.
   c.   warrant; $62,000.
   d.   call; $62,000.
   e.   call; $50,000.

Difficulty level: Medium

CALL OPTION

a   34.   The buyer of a European call option has the:
   a.   right but not the obligation to buy a stock at a specified price on a specified date.
   b.   right but not the obligation to buy a stock at a specified price during a specified period of time.
   c.   obligation to buy a stock on a specified date but only at the specified price.
   d.   obligation to buy a stock sometime during a specified period of time at the specified price.
   e.   obligation to buy a stock at the lower of the exercise price or the market price on the expiration date.

Difficulty level: Medium

CALL OPTION PRICING

e   35.   In the Black-Scholes option pricing formula, $N(d_1)$ is the probability that a standardized, normally distributed random variable is:
   a.   less than or equal to $N(d_2)$.
   b.   less than one.
   c.   equal to one.
   d.   equal to d_1.
   e.   less than or equal to d_1.

Difficulty level: Challenge

PUT OPTION PRICING

b   36.   To compute the value of a put using the Black-Scholes option pricing model, you:
   a.   first have to apply the put-call parity relationship.
   b.   first have to compute the value of the put as if it is a call.
   c.   compute the value of an equivalent call and then subtract that value from one.
   d.   compute the value of an equivalent call and then subtract that value from the market price of the stock.
   e.   compute the value of an equivalent call and then multiply that value by e^{-RT}.

Difficulty level: Medium

EQUITY VALUE OF A FIRM

d   37.   If you consider the equity of a firm to be an option on the firm's assets then the act of paying off debt is comparable to _____ on the assets of the firm.
   a.   purchasing a put option
   b.   purchasing a call option
   c.   exercising an in-the-money put option
   d.   exercising an in-the-money call option
   e.   selling a call option

Difficulty level: Medium

EQUITY VALUE OF A FIRM

a   38.   For every positive net present value project that a firm undertakes, the equity in the firm will increase the most if the delta of the call option on the firm's assets is:
   a.   equal to one.
   b.   between zero and one.
   c.   equal to zero.
   d.   between zero and minus one.
   e.   equal to minus one.

Difficulty level: Medium

OPTIONS AND CAPITAL BUDGETING

a   39.   Shareholders in a leveraged firm might wish to accept a negative net present value project if:
   a.   it increases the standard deviation of the returns on the firm's assets.
   b.   it lowers the variance of the returns on the firm's assets.
   c.   it lowers the risk level of the firm.
   d.   it diversifies the cash flows of the firm.
   e.   it decreases the risk that a firm will default on its debt.

Difficulty level: Medium

AMERICAN & EUROPEAN OPTIONS

d   40.   Which of the following statements is true?
   a.   American options are options on securities of U.S. corporations, and the options are traded on American exchanges. European options are options on securities of U.S. corporations, but the options are traded on European exchanges.
   b.   American options are options on securities which are traded on American exchanges. European options, also traded on American exchanges, are options on European corporations.
   c.   American options give the holder the right to the dividend payment. European options do not.
   d.   American options may be exercised anytime up to expiration. European options may be exercised only at expiration.
   e.   None of the above.

Difficulty level: Medium

OUT OF THE MONEY CALL

e   41.   An out-of-the-money call option is one that:
   a.   has an exercise price below the current market price of the underlying security.
   b.   should not be exercised.
   c.   has an exercise price above the current market price of the underlying security.
   d.   Both A and B.
   e.   Both B and C.

Difficulty level: Medium

CALL OPTION WRITERS

b   42.   Which of the following is not true concerning call option writers?
     a.   Writers promise to deliver shares if exercised by the buyer.
     b.   The writer has the option to sell shares but not an obligation.
     c.   The writer's liability is zero if the option expires out-of-the-money.
     d.   The writer receives a cash payment from the buyer at the time the option is purchased.
     e.   The writer has a loss if the market price rises substantially above the exercise price.

Difficulty level: Medium

IN-THE MONEY PUT OPTION

a   43.   An in-the-money put option is one that:
     a.   has an exercise price greater than the underlying stock price.
     b.   has an exercise price less than the underlying stock price.
     c.   has an exercise price equal to the underlying stock price.
     d.   should not be exercised at expiration.
     e.   should not be exercised at any time.

Difficulty level: Medium

PRICING OPTIONS

e   44.   Which of the following statements is true?
     a.   At expiration the maximum price of a call is the greater of (Stock Price - Exercise) or 0.
     b.   At expiration the maximum price of a call is the greater of (Exercise – Stock Price) or 0.
     c.   At expiration the maximum price of a put is the greater of (Stock Price - Exercise) or 0.
     d.   At expiration the maximum price of a put is the greater of (Exercise – Stock Price) or 0.
     e.   Both A and D.

Difficulty level: Medium

PUT-CALL PARITY

c   45.   Put-call parity can be used to show:
     a.   how far in-the-money put options can get.
     b.   how far in-the-money call options can get.
     c.   the precise relationship between put and call prices given equal exercise prices and equal expiration dates.
     d.   that the value of a call option is always twice that of a put given equal exercise prices and equal expiration dates.
     e.   that the value of a call option is always half that of a put given equal exercise prices and equal expiration dates.

Difficulty level: Medium

The following information should be used for problems #46 – 47:

Tele-Tech Com announces a major expansion into Internet services. This announcement causes the price of Tele-Tech Com stock to increase, but also causes an increase in price volatility of the stock.

CALL OPTIONS

b   46.   Which of the following correctly identifies the impact of these changes on the call option of Tele-Tech Com?
a.   Both changes cause the price of the call option to decrease.
b.   Both changes cause the price of the call option to increase.
c.   The greater uncertainty will cause the price of the call option to decrease. The higher price of the stock will cause the price of the call option to increase.
d.   The greater uncertainty will cause the price of the call option to increase. The higher price of the stock will cause the price of the call option to decrease.
e.   The greater uncertainty has no direct effect on the price of the call option. The higher price of the stock will cause the price of the call option to decrease.

Difficulty level: Medium

PUT OPTIONS

d   47.   Which of the following correctly identifies the impact of these changes on the put option of Tele-Tech Com?
a.   Both changes cause the price of the put option to decrease.
b.   Both changes cause the price of the put option to increase.
c.   The greater uncertainty will cause the price of the put option to decrease. The higher price of the stock will cause the price of the put option to increase.
d.   The greater uncertainty will cause the price of the put option to increase. The higher price of the stock will cause the price of the put option to decrease.
e.   The greater uncertainty has no direct effect on the price of the put option. The higher price of the stock will cause the price of the put option to decrease.

Difficulty level: Medium

DELTA

c   48.   The delta of a call measures:
a.   the change in the ending stock value.
b.   the change in the ending option value.
c.   the swing in the price of the call relative to the swing in stock price.
d.   the ratio of the change in the exercise price to the change in the stock price.
e.   None of the above.

Difficulty level: Medium

BLACK-SCHOLES PARAMETERS

d   49.   The Black-Scholes option pricing model is dependent on which five parameters?
a.   Stock price, exercise price, risk free rate, probability, and time to maturity
b.   Stock price, risk free rate, probability, time to maturity, and variance
c.   Stock price, risk free rate, probability, variance and exercise price
d.   Stock price, exercise price, risk free rate, variance and time to maturity
e.   Exercise price, probability, stock price, variance and time to maturity

Difficulty level: Medium

III. PROBLEMS

OPTION QUOTES

e 50. What is the cost of five November 25 call option contracts on KNF stock given the following price quotes?

KNJ (KNJ)   Underlying stock price: 30.86

Expiration	Strike	Call Last	Put Last
Aug	25	6.15	.05
Nov	25	6.60	.10
Aug	35	.10	4.60
Nov	35	.70	5.10

a. $615
b. $660
c. $2,500
d. $3,075
e. $3,300

Difficulty level: Medium

OPTION QUOTES

c 51. What is the value of one November 35 put contract?

KNJ (KNJ)   Underlying stock price: 30.86

Expiration	Strike	Call Last	Put Last
Aug	25	6.15	.05
Nov	25	6.60	.10
Aug	35	.10	4.60
Nov	35	.70	5.10

a. $70
b. $460
c. $510
d. $4,600
e. $5,100

Difficulty level: Medium

OPTION QUOTES

b   52.   What is the intrinsic value of the August 25 call?

KNJ (KNJ)	Underlying stock price: 30.86		
		Call	Put
Expiration	Strike	Last	Last
Aug	25	6.15	.05
Nov	25	6.60	.10
Aug	35	.10	4.60
Nov	35	.70	5.10

    a. $0.10
    b. $5.86
    c. $6.15
    d. $10.00
    e. $25.00

Difficulty level: Medium

CALL PAYOFF

c   53.   You purchased six TJH call option contracts with a strike price of $40 when the option was quoted at $1.30. The option expires today when the value of TJH stock is $41.90. Ignoring trading costs and taxes, what is your total profit or loss on your investment?
    a. $60
    b. $320
    c. $360
    d. $420
    e. $540

Difficulty level: Medium

CALL PAYOFF

c   54.   You purchased four WXO 30 call option contracts at a quoted price of $.34. What is your net gain or loss on this investment if the price of WXO is $33.60 on the option expiration date?
    a.   -$1,576
    b.   -$136
    c. $1,304
    d. $1,440
    e. $1,576

Difficulty level: Medium

CALL PAYOFF

b   55. You wrote ten call option contracts on JIG stock with a strike price of $40 and an
         option price of $.40. What is your net gain or loss on this investment if the price of JIG
         is $46.05 on the option expiration date?
   a.   -$6,450
   b.   -$5,650
   c. $400
   d. $5,650
   e. $6,450

   Difficulty level: Medium

CALL AND PUT PAYOFFS

b   56. The market price of ABC stock has been very volatile and you think this volatility will
         continue for a few weeks. Thus, you decide to purchase a one-month call option contract on
         ABC stock with a strike price of $25 and an option price of $1.30. You also purchase a one-
         month put option on ABC stock with a strike price of $25 and an option price of $.50. What
         will be your total profit or loss on these option positions if the stock price is $24.60 on the day
         the options expire?
   a.   -$180
   b.   -$140
   c.   -$100
   d. $0
   e. $180

   Difficulty level: Medium

CALL AND PUT PAYOFFS

b   57. Several rumors concerning Wyslow, Inc. stock have started circulating. These rumors
         are causing the market price of the stock to be quite volatile. Given this situation, you
         decide to buy both a one-month put and a call option on this stock with an exercise price of $15.
         You purchased the call at a quoted price of $.20 and the put at a price of $2.10. What will be
         your total profit or loss on these option positions if the stock price is $4 on the day the options
         expire?
   a.   -$230
   b. $870
   c. $890
   d. $910
   e. $1,310

   Difficulty level: Medium

PUT PAYOFF

b   58. Three months ago, you purchased a put option on WXX stock with a strike price of $60 and an option price of $.60. The option expires today when the value of WXX stock is $62.50. Ignoring trading costs and taxes, what is your total profit or loss on your investment?
   a. -$310
   b. -$60
   c. $0
   d. $60
   e. $190

   Difficulty level: Medium

PUT PAYOFF

d   59. You sold ten put option contracts on PLT stock with an exercise price of $32.50 and an option price of $1.10. Today, the option expires and the underlying stock is selling for $34.30 a share. Ignoring trading costs and taxes, what is your total profit or loss on this investment?
   a. -$2,900
   b. -$1,100
   c. $700
   d. $1,100
   e. $2,900

   Difficulty level: Medium

PUT PAYOFF

b   60. You sold a put contract on EDF stock at an option price of $.40. The option had an exercise price of $20. The option was exercised. Today, EDF stock is selling for $19 a share. What is your total profit or loss on all of your transactions related to EDF stock assuming that you close out your positions in this stock today? Ignore transaction costs and taxes.
   a. -$140
   b. -$60
   c. $40
   d. $60
   e. $140

   Difficulty level: Medium

INTRINSIC VALUE

d   61.   You own two call option contracts on ABC stock with a strike price of $15. When you
          purchased the shares the option price was $1.20 and the stock price was $15.90. What
          is the total intrinsic value of these options if ABC stock is currently selling for $14.50
          a share?
     a.   -$280
     b.   -$180
     c.   -$100
     d. $0
     e. $100

     Difficulty level: Medium

INTRINSIC VALUE

e   62.   You own five put option contracts on XYZ stock with an exercise price of $25. What
          is the total intrinsic value of these contracts if XYZ stock is currently selling for
          $24.50 a share?
     a.   -$250
     b.   -$50
     c. $0
     d. $50
     e. $250

     Difficulty level: Easy

INTRINSIC VALUE

e   63.   Last week, you purchased a call option on Denver, Inc. stock at an option price of
          $1.05. The stock price last week was $28.10. The strike price is $27.50. What is the
          intrinsic value per share if Denver, Inc. stock is currently priced at $29.03?
     a.   -$1.05
     b. $0
     c. $.48
     d. $.93
     e. $1.53

     Difficulty level: Medium

INTRINSIC VALUE

d   64.   Three weeks ago, you purchased a July 45 put option on RPJ stock at an option price
          of $3.20. The market price of RPJ stock three weeks ago was $42.70. Today, RPJ stock
          is selling at $44.75 a share and the July 45 put is priced at $.80. What is the intrinsic
          value of your put contract?
     a.   -$295
     b.   -$210
     c. $0
     d. $25
     e. $110

     Difficulty level: Medium

CALL OPTION VALUE

d 65. You own a call option on Jasper Co. stock that expires in one year. The exercise price
        is $42.50. The current price of the stock is $56.00 and the risk-free rate of return is 3.5%.
        Assume that the option will finish in the money. What is the current value of
        the call option?
   a. $13.04
   b. $13.50
   c. $13.97
   d. $14.94
   e. $15.46

   Difficulty level: Medium

CALL OPTION VALUE

e 66. You currently own a one-year call option on Way-One, Inc. stock. The current stock
        price is $26.50 and the risk-free rate of return is 4%. Your option has a strike
        price of $20 and you assume that it will finish in the money. What is the current value
        of your call option?
   a. $6.25
   b. $6.50
   c. $6.76
   d. $7.13
   e. $7.27

   Difficulty level: Medium

CALL OPTION VALUE

e 67. The common stock of Mercury Motors is selling for $43.90 a share. U.S. Treasury bills
        are currently yielding 4.5%. What is the current value of a one-year call option
        on Mercury Motors stock if the exercise price is $37.50 and you assume the option will
        finish in the money?
   a. $6.12
   b. $6.40
   c. $6.69
   d. $7.67
   e. $8.01

   Difficulty level: Medium

CALL OPTION VALUE

d 68. The common stock of Winsson, Inc. is currently priced at $52.50 a share. One year
        from now, the stock price is expected to be either $54 or $60 a share. The risk-free rate
        of return is 4%. What is the value of one call option on Winsson stock with an
        exercise price of $55?
   a. $0.39
   b. $0.41
   c. $0.45
   d. $0.48
   e. $0.51

   Difficulty level: Challenge

CALL OPTION VALUE

a   69. You own one call option with an exercise price of $30 on Nadia Interiors stock. This stock is currently selling for $27.80 a share but is expected to increase to either $28 or $34 a share over the next year. The risk-free rate of return is 5% and the inflation rate is 3%. What is the current value of your option if it expires in one year?

     a. $0.76
     b. $0.79
     c. $0.89
     d. $0.92
     e. $0.95

Difficulty level: Challenge

EQUITY AS A CALL OPTION

b   70. The assets of Blue Light Specials are currently worth $2,100. These assets are expected to be worth either $1,800 or $2,300 one year from now. The company has a pure discount bond outstanding with a $2,000 face value and a maturity date of one year. The risk-free rate is 5%. What is the value of the equity in this firm?

     a. $166.67
     b. $231.42
     c. $385.71
     d. $405.00
     e. $714.29

Difficulty level: Medium

EQUITY AS A CALL OPTION

e   71. Big Ed's Electrical has a pure discount bond that comes due in one year and has a face value of $1,000. The risk-free rate of return is 4%. The assets of Big Ed's are expected to be worth either $800 or $1,300 in one year. Currently, these assets are worth $1,140. What is the current value of the debt of Big Ed's Electrical?

     a. $222.46
     b. $370.77
     c. $514.28
     d. $769.23
     e. $917.54

Difficulty level: Medium

EQUITY AS A CALL OPTION

b   72.   Martha B's has total assets of $1,750. These assets are expected to increase in value to either $1,800 or $2,400 by next year. The company has a pure discount bond outstanding with a face value of $2,000.This bond matures in one year. Currently, U.S. Treasury bills are yielding 6%. What is the value of the equity in this firm?
   a. $16.98
   b. $34.59
   c. $36.67
   d. $37.08
   e. $51.89

   Difficulty level: Medium

PUT-CALL PARITY

d   73.   Tru-U stock is selling for $36 a share. A 3-month call on Tru-U stock with a strike price of $40 is priced at $1. Risk-free assets are currently returning 0.25% per month. What is the price of a 3-month put on Tru-U stock with a strike price of $40?
   a. $2.98
   b. $3.00
   c. $4.03
   d. $4.70
   e. $4.90

   Difficulty level: Medium

PUT-CALL PARITY

d   74.   GS, Inc. stock is selling for $28 a share. A 3-month call on GS stock with a strike price of $30 is priced at $1.50. Risk-free assets are currently returning 0.3% per month. What is the price of a 3-month put on GS stock with a strike price of $30?
   a. $0.50
   b. $2.02
   c. $2.73
   d. $3.23
   e. $4.02

   Difficulty level: Medium

PUT-CALL PARITY

c   75.   J&L, Inc. stock has a current market price of $55 a share. The one-year call on J&L stock with a strike price of $55 is priced at $2.50 while the one-year put with a strike price of $55 is priced at $1. What is the risk-free rate of return?
   a.   2.71%
   b.   2.76%
   c.   2.80%
   d.   2.84%
   e.   2.87%

   Difficulty level: Medium

BLACK-SCHOLES OPTION PRICING MODEL

b   76.   What is the value of d_2 given the following information on a stock?

Stock price	$63
Exercise price	$60
Time to expiration	.50
Risk-free rate	6%
Standard deviation	20%
d_1	.627841

a.   .3133
b.   .4864
c.   .5460
d.   .6867
e.   .7349

Difficulty level: Challenge

BLACK-SCHOLES OPTION PRICING MODEL

b   77.   Given the following information, what is the value of d_2 as it is used in the Black-Scholes Option Pricing Model?

Stock price	$42
Time to expiration	.25
Risk-free rate	.055
Standard deviation	.50
d_1	.375161

a.   .021608
b.   .125161
c.   .175608
d.   .200161
e.   .250161

Difficulty level: Challenge

BLACK-SCHOLES OPTION PRICING MODEL

c   78.   What is the value of a 9-month call with a strike price of $45 given the Black-Scholes Option Pricing Model and the following information?

Stock price	$48
Exercise price	$45
Time to expiration	.75
Risk-free rate	.05
$N(d_1)$	.718891
$N(d_2)$	.641713

a. $2.03
b. $4.86
c. $6.69
d. $8.81
e. $9.27

Difficulty level: Challenge

MARKET VALUE OF EQUITY

b   79. Assume that the delta of a call option on a firm's assets is .792. This means that a
          $50,000 project will increase the value of equity by:
     a. $27,902.
     b. $39,600.
     c. $43,820.
     d. $63,131.
     e. $89,600.

     Difficulty level: Medium

MARKET VALUE OF EQUITY

a   80. The current market value of the assets of Bigelow, Inc. is $86 million, with a standard deviation
          of 15% per year. The firm has zero-coupon bonds outstanding with a total face value of $45
          million. These bonds mature in 2 years. The risk-free rate is 4% per year compounded
          continuously. What is the value of d_1?
     a.   3.54
     b.   3.62
     c.   3.68
     d.   3.71
     e.   3.75

     Difficulty level: Medium

MARKET VALUE OF DEBT

c   81. The current market value of the assets of ABC, Inc. is $86 million. The market value
          of the equity is $43.28 million. What is the market value of the firm's debt?
     a.   Cannot be determined from the information given.
     b. $21.36 million
     c. $42.72 million
     d. $64.08 million
     e. $129.28 million

     Difficulty level: Medium

IV. ESSAYS

OPTION QUOTES AND ARBITRAGE

82. Suppose you look in the newspaper and see ABC trading at $50 per share. Calls on ABC with one
     month to expiration and an exercise price of $45 are trading at $6.50 each. Puts on ABC with one
     month to expiration and an exercise price of $55 are trading at $3.50 each. Are these prices
     reasonable? Explain. (Ignore transactions costs.)

     *The calls are okay since the intrinsic value of each is $5 and the calls are trading at a price greater
     than this. However, the intrinsic value of the puts is $5, but the put is trading at $3.50. Thus, you
     could engage in arbitrage by buying puts for $3.50 each, exercising and selling the shares at the
     exercise price of $55, and purchasing shares to cover the sale in the market at $50 each, netting a
     profit of $150 per contract.*

OUT OF THE MONEY CALLS

83. Suppose XYZ is priced at $125 a share, has a call with an exercise price of $150, and has two months to expiration costs $0.125 per contract. Why do you suppose investors would be willing to purchase a call that is so far out of the money?

Students are basically expected to discuss the impact of time to maturity on option values. They should point out, at a minimum, that with two months left to maturity, there is a chance that the option could finish in the money. More astute students will point out that even though investors may be willing to purchase the option, the price of the option is very low, that is, investors aren't terribly confident the price will rise that far.

OPTION VALUE

84 Suppose your wealthy Aunt Minnie has asked you to manage her large stock portfolio. You would like to buy and/or sell options on many of the stocks she owns. Describe the types of options you would buy or sell, as well as your rationale, given the following circumstances:

a. Aunt Minnie owns 10,000 shares of IBM common stock. You believe it is going to fall in price, but she won't let you sell it because her late husband told her never to let it go. How do you protect her from the impending price decline?

b. Your analysis suggests that the common stock of Jet-Electro is poised to increase in value sharply over the next year. Aunt Minnie doesn't want to buy any of the stock, but does want you to use options to profit if the price rises. What do you do?

c. Although Aunt Minnie doesn't want you to sell any of the stocks she owns, she would like you to use options to generate a little extra income. How might you do this?

Looking at each option, we see:
a. To profit from an expected price decline, you can offset your loss (assuming you don't wish to simply sell the stock) by either buying puts or selling (writing) covered calls on the stock. In this case, you would probably buy puts and sell them before expiration.

b. In this case, the obvious solution is to buy calls and hope to sell them at a higher price later. You could also write puts, but Aunt Minnie would be forced to buy shares if you are wrong about the direction of the price change.

c. You could sell puts as long as you are willing to buy the underlying security if the market moves against you. You do not want to sell covered calls if you are unwilling to sell your shares if the option is exercised. You do not want to sell naked calls as they have unlimited risk.

PRICING BOUNDS

85. What are the upper and lower bounds for an American call option? Explain what would happen in each case if the bound was violated.

The upper bound on a call is the stock price. If the call price exceeded the stock price, you would be paying more for the option to buy an asset than the asset itself costs. The lower bounds are: $C \geq 0$ if $S - E < 0$ and $C \geq (S - E)$ if $(S - E) \geq 0$. In the first case, if the call exercise price exceeds the stock price, the call is out of the money and it will either be worthless or have some time value. In the second case, if the call is in the money, the call must be worth at least the difference between the asset's value and the exercise price. If the call was worth less than this value, rational investors would purchase calls, immediately exercise them, and then sell the stock at the current price, completing an arbitrage.

EQUITY AS A CALL OPTION ON ASSETS

86. Explain the rationale behind the statement that equity is a call option on the firm's assets. When would a shareholder allow the call to expire?

The analogy only works for leveraged firms. At maturity of the firm's debt, the stockholders have the option to either pay the bondholders the par value of their debt or turn the firm's assets over to them. If the firm's assets are worth less than the par value of the debt, the stockholders will not exercise their call, that is, they will let the bondholders have the assets and the firm will be liquidated

Chapter 22

50. Cost = $5 \times 100 \times \$6.60 = \$3,300$
51. Contract value = $\$5.10 \times 100 = \$510$
52. Intrinsic value = $\$30.86 - \$25.00 = \$5.86$
53. Total profit = $(\$41.90 - \$40.00 - \$1.30) \times 100 \times 6 = \$360$
54. Total profit = $(-\$.34 - \$30 + \$33.60) \times 100 \times 4 = \$1,304$
55. Net loss = $(\$.40 + \$40 - \$46.05) \times 100 \times 10 = -\$5,650$
56. Net loss = $[-\$1.30 \times 100] + [(-\$.50 + \$25.00 - \$24.60) \times 100] = -\$130 - \$10 = -\$140$
57. Net profit = $[-\$.20 \times 100] + [(-\$2.10 + \$15.00 - \$4.00 \times 100] = -\$20 + \$890 = \$870$
58. Total loss = $-\$.60 \times 100 = -\$60$ (loss); The option finished out of the money.
59. Total profit = $\$1.10 \times 100 \times 10 = \$1,100$; The option finished out of the money.
60. Total loss = $(\$.40 - \$20.00 + \$19.00) \times 100 = -\$60$ (loss); When the option was exercised, you had to buy at $20.
61. The intrinsic value is zero because the call is currently out of the money.
62. Total intrinsic value = $(\$25.00 - \$24.50) \times 100 \times 5 = \$250$
63. Intrinsic value = $\$29.03 - \$27.50 = \$1.53$
64. Contract intrinsic value = $(\$45.00 - \$44.75) \times 100 = \$25$
65. $C_0 = \$56 - [\$42.50 \div (1 + .035)] = \$14.94$
66. $C_0 = \$26.50 - [\$20 \div (1 + .04)] = \$7.27$
67. $C_0 = \$43.90 - [\$37.50 \div (1 + .045)] = \$8.01$
68. $PV_{rf} = \$54 \div (1 + .04) = \$51.9231$; Number of options needed = $(\$60 - \$54) \div (5 - 0) = 1.2$; $\$52.50 = (1.2 \times C_0) + [\$54 \div (1 + .04)]$; $\$52.50 = 1.2C_0 + \$51.9231$; $1.2C_0 = .5769$; $C_0 = \$.48$
69. $PV_{rf} = \$28 \div (1 + .05) = \$26.6667$; Number of options needed = $(\$34 - \$28) \div (4 - 0) = 1.5$; $\$27.80 = (1.5 \times C_0) + [\$28 \div (1 + .05)]$; $\$27.80 = 1.5C_0 + \$26.6667$; $1.5C_0 = 1.1333$; $C_0 = \$.7555 = \$.76$
70. $PV_{rf} = \$1,800 \div (1 + .05) = \$1,714.2857$; Number of options needed = $(\$2,300 - \$1,800) \div (\$300 - \$0) = 1.6667$; $\$2,100 = (1.6667 \times C_0) + \$1,714.2857$; $1.6667C_0 = \$385.7143$; $C_0 = \$231.42$
71. $PV_{rf} = \$800 \div (1 + .04) = \$769.23$; Number of options needed = $(\$1,300 - \$800) \div (\$300 - \$0) = 1.6667$; $\$1,140 = (1.6667 \times C_0) + \$769.23$; $1.6667C_0 = \$370.77$; $C_0 = \$222.46$; Value of debt = $\$1,140 - \$222.46 = \$917.54$
72. $PV_{rf} = \$1,800 \div (1 + .06) = \$1,698.1132$; Number of options needed = $(\$2,400 - \$1,800) \div (\$400 - \$0) = 1.5$; $\$1,750 = (1.5 \times C_0) + \$1,698.1132$; $1.5C_0 = \$51.8868$; $C_0 = \$34.59$
73. $P = (\$40 \div 1.0025^3) + \$1 - \$36 = \$4.70$
74. $P = (\$30 \div 1.003^3) + \$1.50 - \$28 = \$3.23$
75. $\$55 \div (1 + r) = -\$2.50 + \$55 + \$1$; $r = 2.80\%$
76. $d_2 = .627841 - (.20 \times \sqrt{.5}) = .4864$
77. $d_2 = .375161 - (.50 \times \sqrt{.25}) = .125161$
78. $C = (\$48 \times .718891) - (\$45 \times 2.71828^{-.05 \times .75} \times .641713) = \$34.5068 - \$27.8142 = \$6.69$
79. Increase in equity value = $\$50,000 \times .792 = \$39,600$
80. $d_1 = \{\ln(\$86m \div \$45m) + [.04 + (.15^2 \div 2)] \times 2\} \div \{.15 \times \sqrt{2}\} = 3.54$
81. Market value of debt = $\$86m - \$43.28m = \$42.72m$