Diagnostic Test F4E - September 21 2018

(the formula sheet is handed out separately)

Mention your name, student number and course-code category (IEM / BIT / PREM / other) at all sheets you hand in.

The tests consists of two parts:

Part A: Finance (and Accounting): multiple choice questions 1-20, and open question A

Part B: Option Pricing: multiple choice questions 21-29, and open question B

Write your answers to multiple choice questions at the computer form

Write your answers to open questions A and B at the open-question form (one question per page)

Part A: Finance

1. An investment at 15% compounded continuously has an equivalent annual rate of:

   A. 16.18%.

   B. 13.93%.

   C. 16.34%.

   D. none of the options.

2. What is the present value of a $2,000 per year annuity for five years at an interest rate of 12%?

   A. $12,705.70

   B. $7,209.56

   C. $1,134.86

   D. $5,486.56

3. A three-year bond with 5% coupon rate and $1,000 face value yields 8%. Assuming annual coupon payments, the price of the bond is closest to

   A. $857
   B. $923
   C. $1,000
   D. $1,051

4. If a bond's volatility (or "modified duration") is 5.00% and the interest rate goes up by 0.25% (points), then the price of the bond:

   A. decreases by 0.8%
   B. decreases by 1.25%
   C. increases by 1.25%
   D. increases by 5.25%

5. Mr. Y lends $1,000 at a 1% interest rate for one year. If the inflation rate is 2%, what is the real value of the corresponding cash flow at the end of one year?

   A. $990.20
   B. $990.10
   C. $1,000.00
   D. $1,009.90

6. Aholk Inc. expects to pay a dividend of $3 per share at the end of year 1 (DIV_1) and these dividends are expected to grow at a constant rate of 3% per year forever. If the required rate of return on the stock is 15%, what is the current value of the stock today?

   A. $15
   B. $25
   C. $100
   D. $54

7. Sunny Co. expects to pay a dividend of $2.00 per share—one year from now—out of earnings of $3.00 per share. If the required rate of return on the stock is 15% and its dividends are growing at a constant rate of 10% per year, calculate the present value of growth opportunities for the stock (PVGO).

   A. $10
   B. $20
   C. $26
   D. $30

8. Global Air is a no-growth firm and has two million shares outstanding. It expects to earn a constant $24 million per year on its assets. If it has no debt, all earnings are paid out as dividends, and the cost of capital is 8%, calculate the current price per share of the stock.

   A. $200
   B. $150
   C. $100
   D. $50

9. Stock X has a standard deviation of return of 20%. Stock Y has a standard deviation of return of 10%. The correlation coefficient between the two stocks is 0.5. If you invest 40% of your funds in stock X and 60% in stock Y, what is the standard deviation of your portfolio?

   A. 10.3%
   B. 21.0%
   C. 12.2%
   D. 14.8%

10. For a two-stock portfolio, the maximum reduction in risk occurs when the correlation coefficient between the two stocks equals:

A. +1.0.
B. -0.5.
C. -1.0.
D. 0.0.

11. The correlation coefficient between a stock and the market portfolio is +0.3. The standard deviation of return of the stock is 60% and that of the market portfolio is 20%. Calculate the beta of the stock.

A. 1.1
B. 1.0
C. 0.9
D. 0.6

12. An efficient portfolio:

I) has risk that cannot be reduced
II) provides the highest expected return for a given level of risk;
III) provides the least risk for a given level of expected return;
IV) has no risk at all

A. I only
B. II and III only
C. IV only
D. I, II and III only

13. Assume the following data for a stock: Beta = 0.8; Risk-free rate = 2%; Market rate of return = 12%; and Expected rate of return on the stock = 9%. Then the stock is:

A. overpriced.
B. underpriced.
C. correctly priced.
D. cannot be determined.

14. Assume the following data for a stock: Risk-free rate = 5%; Beta (market) = 1.4; Beta (size) = 0.4; Beta (book-to-market) = -1.1; Market risk premium = 7%; Size risk premium = 3.7%; and book-to-market risk premium = 5.2%. Calculate the expected return on the stock using the Fama-French three-factor model.

A. 22.3%

B. 7.8%

C. 10.6%

D. 20.9%

15. Which of the following is an example of a leverage ratio?

A. Quick ratio

B. Debt-equity ratio

C. Payout ratio

D. Return on equity

16. Assume the following data: Sales = 3200; Cost of goods sold = 1600; Average receivables = 200. Calculate the average collection period (in days).

A. 24.3

B. 22.8

C. 137

D. 45.6

17. When a firm improves (lowers) its days of inventory it generally:

A. requires additional cash investment in inventory.

B. releases cash locked up in inventory.

C. does not alter its cash position.

D. cannot reduce its inventories.

18. Assume the following data: Earnings per share = $6; Dividends per share = $4; Price per share = $60. Calculate the P/E ratio.

A. 10

B. 20

C. 25

D. 16.7

19. Which measure would be most useful in comparing the operating profitability of two firms in different industries?

A. Net profit margin

B. Return on equity

C. Sales to total assets

D. Return on assets

20. Market value ratios indicate:

I) whether the firm is using its assets productively;

II) whether the firm is liquid;

III) whether the firm is profitable;

IV) how highly the firm is valued by investors

A. I only

B. II only

C. II and III only

D. IV only

Open question A (give your answer at the first page of the open-question form):
Make a sketch of (i) the Capital Market Line (CML) and (ii) the Security Market Line (SML), based on a rough estimate of the risk-free rate and the market risk premium, assuming S&P 500 as market portfolio. The exact numerical values are not important, but should be reasonable. Clearly label your axes in both the CML and in the SML. Indicate in both graphs an estimate of the locations of the shares of Ford and Tesla, and of S&P 500. Again, coordinates need not be precise, estimates may be even very rough. Briefly explain the chosen locations. Please respect the one-page restriction, be to-the-point.

[see next page for part B]

Part B – Option Pricing

21.

If you write a call option, you acquire the right to buy stock at a fixed strike price.

A. True
B. False

22.

In June 2016, an investor buys call options on Amgen stock with an exercise of price of $65 and expiring in January 2018. If the current stock price is $70, then these options are:

A. in-the-money
B. out-of-the-money

23.

Suppose an investor sells (writes) a put option. What will happen if the stock price on the exercise date exceeds the exercise price?

A. The seller will need to deliver stock to the owner of the option.
B. The seller will be obliged to buy stock from the owner of the option.
C. The owner will not exercise his option.
D. The option will extend for nine more months

[please turn over]

24. Figure 3 depicts the:

Profit
Breakeven is $75
$5
0
$80   Share price
Loss   **Figure-3**
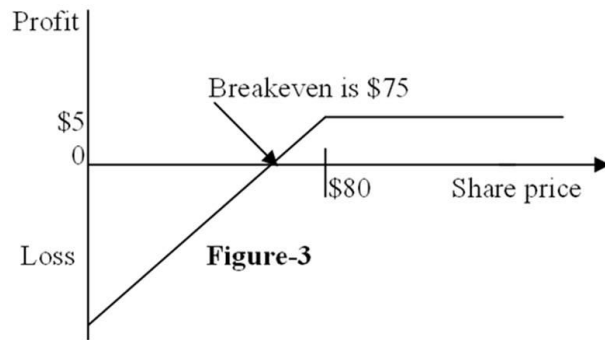
A. profit diagram for the writer (seller) of a call option.

B. position diagram for the writer (seller) of a call option.

C. profit diagram for the writer (seller) of a put option.

D. position diagram for the writer (seller) of a put option.

25.

Which of the following features increase(s) the value of a call option?

I) increased price of underlying;

II) increased volatility of the underlying;

III) as time progresses to maturity.

A. I and II only

B. II and III only

C. I and III only

D. All

26.

Buying an out-of-money option will almost never bring a profit.

A. True

B. False

27.
Which of the following investors would be happy to see the stock price rise sharply?

I) An investor who owns the stock and has sold a put option;

II) An investor who has sold a put option and bought a call option;

III) An investor who owns the stock and has sold a call option;

IV) An investor who has sold a call option

A. I only

B. III only

C. I and II only

D. III and IV only

28.
Suppose Ralph's stock price is currently $50. In the next six months it will either fall to $30 or rise to $80. What is the option delta of a call option with an exercise price of $50?

A. 0.375

B. 0.500

C. 0.600

D. 0.750

29.
The option delta for a put option can be positive or negative

A. True

B. False

Open question B (give your answer at the second page of the open-question form):

Suppose ABCD's stock price is currently $25. In the next six months it will either fall to $20 or rise to $40. The six-month risk-free interest rate is 2% (it is **not** the yearly rate).
What is the current value of a six-month call option with an exercise price of $25? Explain your answer.

[end of the test]