UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATTION
SEMESTER II
SESSION 2016/2017

COURSE NAME   :   INVESTMENT ANALYSIS

COURSE CODE   :   BWA 30503

PROGRAMME CODE   :   BWA

EXAMINATION DATE   :   JUNE 2017

DURATION   :   3 HOURS

INSTRUCTION   :   ANSWER **ALL** QUESTIONS

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THIS QUESTION PAPER CONSISTS OF **SIX (6)** PAGES

Q1   (a)   Suppose a company pays a dividend at the end of each year. Let D_t denote a dividend to be paid t years from now, and let P_0 represent the present value of the future dividend stream. Also, let k denote the appropriate risk-adjusted discount rate. Using the dividend discount model, the present value of a share of this company's stock is measured as this sum of discounted future dividends:

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \cdots + \frac{D_T}{(1+k)^T}.$$

It is assumed that the last dividend is paid T years from now. The value of T depends on the time of the *terminal,* or last, dividend. Calculate the present value P_0 if $T = 3$ years and $D_1 = D_2 = D3 = RM100$, where the discount rate is $k = 10$ percent.

(5 marks)

      (b)   Assume the firm will pay dividends that grow at the constant rate g forever. In this constant perpetual growth model, stock prices are calculated using the following formula:

$$P_0 = \frac{D_0(1+g)}{k-g}, \ g < k.$$

Suppose dividends for a particular company are projected to grow at 5 percent forever. Calculate the value of the stock if the discount rate is 15 percent and the current dividend is RM10.

(4 marks)

      (c)   A two-stage dividend growth model assumes that a firm will initially grow at a rate g_1 during a first stage of growth lasting T years and thereafter grow at a rate g_2 during a perpetual second stage of growth. The formula for the two-stage dividend growth model is stated as follows:

$$P_0 = \frac{D_0(1+g_1)}{k-g_1}\left[1-\left(\frac{1+g_1}{1+k}\right)^T\right] + \left(\frac{1+g_1}{1+k}\right)^T\left[\frac{D_0(1+g_2)}{k-g_2}\right].$$

Suppose a firm has a current dividend of $D_0 = RM5$, which is expected to "shrink" at the rate $g_1 = -10$ percent for $T = 5$ years and thereafter grow at the rate $g_2 = 4$ percent. With a discount rate of $k = 10$ percent, calculate the value of the stock.

(11 marks)

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Q2 (a) Suppose that a company has come up with the following dividend forecasts for the next three years as shown in **Table Q2(a)**.

Table Q2 (a): Dividend Forecasts

Year	Expected Dividend (in RM)
1	1.00
2	2.00
3	2.50

After the third year, the dividend will grow at a constant rate of 5 percent per year. The required return is 10 percent. Calculate the value of the stock today.

(8 marks)

(b) Chain Reaction, Inc., has been growing at a phenomenal rate of 30 percent per year because of its rapid expansion and explosive sales. It is believed that this growth rate will last for three more years and that the rate will then drop to 10 percent per year. Chain Reaction's situation is an example of supernormal growth. It is unlikely that a 30 percent growth rate can be sustained for any extended length of time. Given that total dividends just paid were RM5 million, and the required return is 20 percent.

(i) Calculate the total dividends over the supernormal growth period in order to value the equity in this company.

(3 marks)

(ii) Calculate the total value of the stock if the growth rate then remains at 10 percent indefinitely.

(9 marks)

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Q3 (a) One popular technical indicator is called the *advance/decline line*. This indicator shows, for some given period, the cumulative difference between advancing issues and declining issues. **Table Q3 (a)** contains advance and decline information for the May 1, 2017, to May 5, 2017, trading week.

Table Q3 (a): Advance/Decline Line Calculation

Weekday	Issues Advancing	Issues Declining
Monday	2,511	809
Tuesday	1,922	1,375
Wednesday	1,233	2,068
Thursday	2,023	1,248
Friday	2,505	815

This cumulative advance/decline number, once plotted, is the advance/decline line. A downward-sloping advance/decline line would be considered a bearish signal, whereas an upward-sloping advance/decline line is a bullish signal. Calculate difference and cumulative difference for these advancing issues and declining issues.

(10 marks)

(b) Relative strength charts illustrate the performance of one company, industry, or market relative to another. Consider the following series of monthly stock prices (in RM) for two hypothetical companies as shown in **Table Q3 (b)**.

Table Q3 (b): Monthly Stock Prices

Month	Company *A*	Company *B*
1	25	50
2	24	48
3	22	45
4	22	40
5	20	39
6	19	38

Compare the performance of Company *A* with Company *B* on a relative basis. Suppose four shares of Company *A* and two shares of Company *B* for an investment of RM100 in each had been purchased.

(10 marks)

Q4 (a) Moving averages are used to generate price reversal signals. As the name implies, a moving average is simply the average closing price of a stock over a fixed length of time, say 20 days. Moving averages are either simple or exponential. In a *simple moving average,* all days are given equal weighting. In an *exponential moving average,* more weight is given to the most recently observed price. Market technicians, like many investors, often believe that the latest price observed for a stock is the most important piece of information about the stock. **Table Q4 (a)** shows the closing price of a stock.

Table Q4 (a): Closing Price

Day	Closing Price
1	89.00
2	88.44
3	87.60
4	86.20
5	85.75
6	84.57
7	83.64
8	76.70
9	76.65
10	75.48

(i) Calculate the price for a three-day simple moving average.

(8 marks)

(ii) Calculate the price for a three-day exponential moving average, where two-thirds of the average weight is placed on the most recent price.

(9 marks)

(b) Market technicians are interested in ϕ because:

$$(\phi - 1) / \phi = 0.618 / 1.618 = 0.382$$
$$1 / \phi = 1.000 / 1.618 = 0.618 = \phi - 1$$

Market technicians use these numbers to predict support and resistance levels. For example, as a stock increases in value over time, it will occasionally pull back in value. Suppose a stock has increased from RM40 to RM60, and has recently begun to fall a bit in value. Calculate the primary and secondary support areas for the stock.

(3 marks)

Q5 (a) Consider the following information as shown in **Table Q5 (a)**.

Table Q5 (a): Rate of Return

State of Economy	Probability of State of Economy	Rate of Return If State Occurs		
		Stock A	Stock B	Stock C
Boom	0.20	0.18	0.48	0.33
Good	0.40	0.11	0.18	0.15
Poor	0.30	0.05	−0.09	−0.05
Bust	0.10	−0.03	−0.32	−0.09

The portfolio is invested 25 percent each in A and C, and 50 percent in B. Hence, calculate the expected return and the variance for this portfolio.

(15 marks)

(b) In essence, the Value-at-Risk (usually abbreviated VaR) method involves evaluating the probability of a significant loss. The returns on an investment follow a normal distribution, then we can state the probability that a portfolio's return will be within a certain range. Here, a stock has an annual return mean and standard deviation of 11 percent and 34 percent, respectively.

Calculate the smallest expected loss in the coming year with a probability of 5 percent. Use $Z_{0.05} = 1.645$ in your calculation.

(5 marks)

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– END OF QUESTIONS –