

DP09

Investment

11 OCTOBER 2001

1. Time allowed : Three (3) hours
2. Total number of questions : Five (5) questions
3. Number of questions to be answered : All five (5) questions
Part A : One (1) question [20 marks]
Part B : Four (4) questions [20 marks each]
4. Show details of workings, where appropriate. Silent, non-programmable calculators may be used.
5. Begin each answer to a new question on a fresh page.
6. Answer **all** questions in **English**.
7. A blank page is provided at the end of the question paper for rough work.

PART A

1. **Only brief answers are required in this question (a few words or a few sentences). Answer ALL parts of the question.**

- (a) Define what is meant by a derivative security. [2]
- (b) Briefly describe **three** benefits of holding derivative securities. [6]
- (c) Briefly describe **three** distinctive differences between call options and warrants. [6]
- (d) Apart from the effects of leverage value, dilution and interest rates, list and briefly describe **three** other determinants that affect the value of warrants. [6]

(Total:20 marks)

PART B

ANSWER ALL QUESTIONS

2. (a) The following data on ABS Bhd is provided:

Item	1996	1997	1998	1999	2000
Share price (RM)	16.50	4.50	5.20	8.30	5.30

- (i) Calculate the arithmetic mean rate of return over the **four** years for the share price of ABS Bhd. Show all workings. [2]
- (ii) Calculate the geometric mean rate of return over the **four** years for the share price of ABS Bhd. Show all workings. [2]
- (b) An analyst has calculated the rate of return on the Kuala Lumpur Composite Index (KLCI) using both an arithmetic mean and a geometric mean over the last **20** years. The arithmetic mean rate of return for the KLCI over the last **20** years was 13.2% while the geometric mean rate of return for the KLCI was 11.7% over the same period.

Assume you are trying to determine a required rate of return on a particular asset based on the Capital Asset Pricing Model. This rate of return will be used in your Dividend Discount Model to calculate an intrinsic value of the share.

Would you use the arithmetic mean rate of return or the geometric mean rate of return? Explain your answer. [4]
- (c) Briefly explain what is systematic risk. [2]
- (d) Briefly describe **two** circumstances under which false trading takes place. [2]
- (e) Briefly describe **two** circumstances under which stock market manipulation takes place. [2]
- (f) Fraudulently inducing persons to deal in securities is prohibited by the Securities Industry Act 1983. List **two** instances of fraud. [2]
- (g) List **two** circumstances under which specific confidential information may arise. [2]
- (h) List **two** regulatory bodies of the Malaysian financial futures and options industry. [2]

(Total:20 marks)

3. (a) You are given the following market data:

Return of Malaysian T-bills	6.0%
Return of Corporate Bond rated A	7.0%
Return of Corporate Bond rated BBB	8.0%

Using the Capital Asset Pricing Model, which risk-free rate would you choose? Explain your answer. [2]

- (b) You are also given the following data on **two** listed companies, Good Growth Bhd and Solid Prospects Bhd:

Item	Good Growth Bhd	Solid Prospects Bhd
Beta	1.3x	0.9x
Current dividend (D_0)	10sen	50sen
Expected growth rate	6.0%	5.0%
Required rate of return on the market	11.0%	11.0%

- (i) Calculate the required rate of return for both Good Growth Bhd and Solid Prospects Bhd using the above data, the chosen risk-free rate in (a) above and the Capital Asset Pricing Model. [4]
- (ii) Calculate the intrinsic value for both Good Growth Bhd and Solid Prospects Bhd using the above data and the Infinite Period Dividend Discount Model. [4]
- (iii) Good Growth Bhd is now trading at RM2.50 a share while Solid Prospects Bhd is trading at RM7.00 a share.
Which share would you buy based on the above calculations? State your reasons. [2]
- (iv) Briefly describe what beta measures. [2]
- (v) If the earnings per share is 20sen in the current period and is expected to grow by 6.0% next year, calculate the expected price/earnings (P/E) ratio for Good Growth Bhd. [4]
- (vi) Good Growth Bhd is now trading at RM2.00 a share. If the stock market rises from **700** points to **770** points, what would you expect the share price to be, given a beta of 1.3x? [2]
- (Total:20 marks)

4. (a) State **three** theories that explain the shape and slope of the yield curves. [3]
- (b) Briefly explain why the shape and the slope of the yield curves shift over time according to the **three** theories that you have stated in (a) above. [3]
- (c) Briefly explain what is the yield-to-maturity for a bond. [2]
- (d) You are given the following information on the bonds of **three** companies operating in the same industry:

Company	Tenor	Bond rating	Coupon rate
DEF Bhd	10 year	AAA	7.4%
GHI Bhd	10 year	A	7.5%
TUV Bhd	10 year	BB	7.3%

- (i) Based on the above information, and assuming all other things being equal, which bond is expected to have the highest yield-to-maturity? State the reason for your answer. [3]
 - (ii) Based on the above information, and assuming all other things being equal, which bond is expected to have the highest bond price? State the reason for your answer.[3]
 - (e) (i) What is a zero coupon bond? [1]
 - (ii) What risk is eliminated if a bondholder were to purchase and hold a zero coupon bond till maturity? [1]
 - (f) (i) What is a convertible bond? [1]
 - (ii) List **one** advantage of a convertible bond to the issuer. [1]
 - (iii) List **two** advantages of a convertible bond to the bondholder. [2]
- (Total:20 marks)

5. (a) CON Bhd has secured approval from the relevant authorities for a rights issue of 2:5 at RM1.25 a share and a bonus issue of 1:2. The rights issue will come after the bonus issue.

Given a cum-rights price and bonus price of RM5.20 a share, calculate the theoretical ex-rights price per share for CON Bhd. [4]

- (b) Based on the theoretical ex-rights price per share that you have calculated in (a) above, calculate the earnings adjustment factor for CON Bhd. The ex-date for the rights and bonus issues is 2 January 2001. [1]

- (c) The following information is provided for CON Bhd:

Item	As at December 1999	As at December 2000	December 2001 forecast
Net profit	RM22.2million	RM25.6million	RM20.8million
Share capital	80million shares	80million shares	168million shares

- (i) Based on the above information and the earnings adjustment factor that you have calculated in (b) above, calculate CON Bhd's adjusted net earnings per share (EPS) for 1999, 2000 and 2001. [3]
 - (ii) Why is it necessary to adjust the net EPS for 1999 and 2000 for CON Bhd? [2]
 - (iii) Not long after CON Bhd secured approval, the allotment letter to the rights issue started trading on the Kuala Lumpur Stock Exchange (KLSE).
Calculate the value of the rights based on your answers derived in (a) above. [2]
 - (iv) If CON Bhd decides not to propose a bonus issue but to proceed with the 2:5 rights issue, the theoretical ex-rights price per share will still be below the cum-rights price of RM5.20 a share.
Without calculating the new theoretical ex-rights price per share, explain qualitatively why the share price of CON Bhd is adjusted downwards. [3]
- (d) Various departments, subsidiaries and affiliate companies manage the day-to-day operations of KLSE. List **five** such companies. [5]
- (Total:20 marks)

- END OF QUESTION PAPER -

OUTLINE ANSWERS

Part A

Question 1

Many candidates did not know the benefits of holding derivatives securities while some others did not know how the value of warrants are affected by its time to maturity and the volatility of the underlying shares. Candidates should spend more time understanding how such basic factors affect derivative instruments.

1. (a) A derivative instrument is one in which the performance is determined by the performance of another instrument. Therefore, the value of a derivative instrument depends on the value of some other basic underlying instruments, such as commodity prices, exchange rates, interests rates or share prices.
- (b) The three benefits of holding derivative securities are as follows (any **three**):
 - For managing risks associated with holding the underlying asset position.
 - For portfolio asset allocation purposes.
 - For income generation through taking a position in these products.
 - For the ability to hedge and reduce risk.
 - To reduce volatility in the cash market.
- (c) The three distinctive differences between calls and warrants are as follows:
 - Warrants are issued by companies, whereas puts and calls are created by investors;
 - Warrants typically have maturities of at least several years, whereas listed calls expire within several months; and
 - Warrant terms are not standardised – each warrant is unique.
- (d) The three remaining determinants of a warrant premium are as follows:
 - Remaining warrant life – the larger the remaining life of a warrant, the more valuable it is;
 - Price volatility – the greater the price volatility of the underlying shares, the more likely is the warrant to increase its intrinsic value given a time period; and
 - Dividend yield – an inverse relationship exists between the warrant premium and the expected dividend of the underlying shares.

Part B

Question 2

- Many candidates could not calculate the arithmetic and geometric mean rates of return for a stock. Instead of using the percentage changes, they used the absolute stock prices in calculating these rates of return.
- Questions on risk and return, Securities Industries Act, and KLOFFE, which required memory work, were also not answered well.

2. (a) (i) Arithmetic mean:

$$\frac{\sum HPY}{n}$$

$$= (-0.7272 + 0.1555 + 0.5961 - 0.3614) \div 4$$

$$= -8.4\%$$

- (ii) Geometric mean:

$$= (0.2727 \times 1.1555 \times 1.5961 \times 0.6386)^{1/4} - 1$$

$$= (0.3212)^{1/4} - 1$$

$$= 0.7528 - 1$$

$$= -24.7\%$$
- (b) The arithmetic mean rate of return is a useful measure of an average performance of an investment over a single period. The geometric mean rate of return, on the other hand, measures the average rate of growth of an investment over multiple periods. Given that your dividend discount model extends over multiple periods, the geometric mean rate of return would be the correct rate of return to use.
- (c) Total risk = systematic risk + unsystematic risk
- Systematic risk is the general component of total risk, which encompasses risks like interest rate risks, market risk, and inflation risk. This part of the total risk is unavoidable and is non-diversifiable.
- (d) False trading occurs if the following takes place:
- a transaction to buy or sell any securities is effected and it does not involve any change in beneficial ownership of shares; and
 - an offer to buy and sell any securities at a specified price which is substantially the same as the first mentioned price.
- (e) Stock market manipulation takes place when:
- the price of the securities of a company on a stock market in Malaysia is raised.
 - the price of the securities of a company on a stock market in Malaysia is maintained or stabilised.
- (f) **Two** instances of fraud are as follows:
- Making misleading or deceptive forecasts or promises; and
 - Dishonest concealment of material facts.
- (g) **Two** circumstances under which specific confidential information may arise:
- a possible takeover bid; and
 - the possibility of the company entering into a substantial commercial transaction with another corporation.
- (h) **Two** regulatory bodies of the Malaysian financial futures and options industry:
- Ministry of Finance; and
 - Securities Commission.

Question 3

Many candidates did not know the formulae for Capital Asset Pricing Model and Infinite Period Dividend Discount Model, thus were not able to answer the questions though all the variables were provided to them.

3. (a) The Malaysian Treasury bill. The risk-free rate is the return on a riskless asset such as the US Treasury bill or the Malaysian Treasury bill.
- (b) (i) The required rate of return of an asset is as follows:
- $$k_i = \text{risk-free rate} + \text{risk premium}$$

$$k_i = RFR + B_i * (MR - RFR)$$

For Good Growth Bhd:

$$k_i = 6.0\% + 1.3 * (11.0\% - 6.0\%)$$

$$k_i = 6.0\% + 6.5\%$$

$$k_i = 12.5\%$$

For Solid Prospects Bhd:

$$k_i = 6.0\% + 0.9 * (11.0\% - 6.0\%)$$

$$k_i = 6.0\% + 4.5\%$$

$$k_i = 10.5\%$$

- (ii) Using the Infinite Period Dividend Discount Model, the value of Good Growth Bhd and Solid Prospects Bhd are as follows:

$$\text{Value of Good Growth Bhd} = D_1 / k - g$$

$$= \frac{D_0 \times (1 + g)}{k - g}$$

$$= \frac{10\text{sen} \times (1 + 0.06)}{12.5\% - 6.0\%}$$

$$= 10.6\text{sen} / 6.5\%$$

$$= \text{RM1.63}$$

$$\text{Value of Solid Prospects Bhd} = D_1 / k - g$$

$$= \frac{D_0 \times (1 + g)}{k - g}$$

$$= \frac{50\text{sen} \times (1 + 0.05)}{10.5\% - 5.0\%}$$

$$= 52.5\text{sen} / 5.5\%$$

$$= \text{RM9.55}$$

- (iii) Investors should purchase Solid Prospects Bhd based on its theoretical intrinsic value of RM9.55 a share compared to its current share price of RM7.00 a share. The stock is under valued. In contrast, Good Growth Bhd is only valued at RM1.63 a share compared to its current share price of RM2.50 a share.
- (iv) Beta measures the systematic risk for a stock. It is the risk of an individual stock in relation to the overall market, as measured by the volatility of its returns. Quantitatively measured, beta is the slope of the regression line relating a security's returns to those of the market.
- (v) The expected P/E ratio is conceptually a function of three factors:

$$\frac{P}{E} = \frac{D_1 / E_1}{k - g}$$

$$= [10.6 / (20 * 1.06)] / [12.5\% - 6.0\%]$$

$$= 0.5 / 0.065$$

$$= 7.7x$$

- (vi) If a stock has a beta of 1, then for every 1% change in the market return, the security's return changes by 1%. Similarly, if a stock has a beta of 1.3x, then for every 10% change in the market return, the security's return changes by 13%. Consequently, given that the market has gone up by 10%, i.e. from 700 points to 770 points, Good Growth's return should increase by 13% from RM2.00 a share to RM2.26 a share.

Question 4

- Many candidates lacked understanding of bonds and their characteristics, and could not remember the three theories that explain the shape and slope of the yield curves.
- Candidates also failed to understand what affects a bond's yield-to-maturity and price, and its relationship.

4. (a) **Three** theories that explain the shape and slope of the yield curves:
- Market segmentation theory;
 - Liquidity preference theory; and
 - Expectations theory.
- (b) **Market segmentation theory** – The yield curve will change as the demand for or supply of securities in various parts the maturity range changes. Such changes may have little or no effect on other parts of the yield curve.
- Liquidity preference theory** – Upward sloping curves should predominate because of the uncertainty premiums on longer term securities. The yield curve will shift as expectations about future rates change.
- Expectations theory** – The shape of the yield curve at any point in time has implications about the expectations of market participants.
- (c) The yield-to-maturity for a bond is the interest rate that equates the present value of the cash flows to be received on the bond to the initial investment in the bond, which is the current price.
- (d) (i) TUV Bhd's 10-year bonds should have the highest yield-to-maturity given that it has the lowest credit ratings which implies a higher risk of default.
- (ii) DEF Bhd's 10-year bonds should have the highest price given that it has the highest credit ratings and lowest yield-to-maturity. For any given maturity, the price of a bond will decline as the market yield increases and increase as the market yield declines.
- (e) (i) A zero coupon bond is as the name implies a bond that pays no coupon.
- (ii) Zero coupon bonds are bought at a discount and redeemed for face value at maturity. The bonds can lock in a fixed rate of return for a long period, thereby eliminating reinvestment risk.
- (f) (i) A convertible bond is a combination of a bond and a call option on the common stock.

- (ii) The advantage to the issuer is that the convertible bond often lowers the interest rates on its debt.
- (ii) For the holder of a convertible bond, the advantages are as follows:
- Convertible bonds have an upside potential of a common stock; and
 - Convertible bonds offer the downside protection of a bond provided the bond is held to maturity. Should interest rates rise and the bond sold before maturity, then there may be risk of capital loss.

Question 5

- This was an application-type question involving the adjustment factor to be applied to a firm's earnings per share following a "Rights and Bonus" issue.
- Candidates had difficulty calculating the theoretical ex-rights price of a share.
- Candidates also lacked understanding of how an adjustment factor is used, that is, for adjusting historical earnings per share and price per share so that they are comparable to future earnings and price per share.

5. (a) Theoretical ex-rights price per share:

	RM
10 existing shares at RM5.20 per share	52.00
5 bonus issue shares	-
6 rights issue shares at RM1.25 per share	<u>7.50</u>
21 shares worth	<u>59.50</u>

Theoretical ex-rights price per share = $\text{RM}59.50 \div 21 \text{ shares}$

$$= \text{RM}2.83$$

(b) Earnings adjustment factor = $\frac{\text{theoretical ex-rights price per share}}{\text{last traded cum-rights price per share}}$

$$= \text{RM}2.8333 \div \text{RM}5.20$$

$$= 0.545$$

(c) (i) 1999 EPS = $(\text{RM}22.2\text{m} \div 80.0\text{m shares}) \times 0.545$

$$= \text{RM}0.2775 \times 0.545$$

$$= \text{RM}0.151 \text{ or } 15.1\text{sen}$$

2000 EPS = $(\text{RM}25.6\text{m} \div 80.0\text{m shares}) \times 0.545$

$$= \text{RM}0.32 \times 0.545$$

$$= \text{RM}0.174 \text{ or } 17.4\text{sen}$$

2001 EPS = $(\text{RM}20.8\text{m} \div 168.0\text{m shares})$

$$= \text{RM}0.124 \text{ or } 12.4\text{sen}$$

Note that unlike 1999 and 2000, no earnings adjustment factor is necessary for the year 2001.

- (ii) All prior year's earnings must be multiplied by this adjustment factor before they can be used to compare the current and future earnings per share as they will be measured on a similar basis.

(iii) Value of the rights allotment letter

Ex-rights per share	RM2.83
Less: subscription price	<u>RM1.25</u>
Value of rights	<u>RM1.58</u>

(iv) The share price of CON Bhd is adjusted downwards to reflect the bonus element in the rights issue.

(d) **Five** companies that manage day-to-day operations of KLSE:

- (i) Securities Clearing Automated Network Services Sdn Bhd;
- (ii) Malaysian Central Depository Sdn Bhd;
- (iii) KLSE-Bernamea Real-time Information Services Sdn Bhd;
- (iv) KLSE Chilong Systems Sdn Bhd; and
- (v) Research Institute of Investment Analysis Malaysia.