QUESTIONS

NUMBER ONE

Kymat plc and Rudat plc are quoted companies. The following figures are from their current balance sheets:

	Kymat plc Sh.'000	Rudat plc **Sh.'000**
Ordinary share capital		
Authorised: 2,000,000 shares of 50p	1,000	1,000
Issued: 1,000,000 shares of 50p	500	500
Reserves	1,750	150
Shareholders' funds	2,250	650
6% Irredeemable debentures	-	2,500

Both companies earn an annual profit, before charging debenture interest of Sh.500,000 which is expected to remain constant for the indefinite future. The profits of both companies, before charging debenture interest, are generally regarded as being subject to identical levels of risk. It is the policy of both companies to distribute all available profits as dividends at the end of each year.

The current market value of Kymat Ltd.'s ordinary shares is Sh.3.00 per share cum div. An annual dividend is due to be paid in the very near future.

Rudat Ltd. has just made annual dividend and interest payments both on its ordinary shares and on its debentures. The current market value of the ordinary shares is Sh.1.40 per share and of the debentures, Sh.50.00 percent.

Mr. Kuria owns 50,000 ordinary shares in Rudat Ltd. He is wondering whether he could increase his annual income, without incurring any extra risk, by selling his shares in Rudat Ltd and buying some of the ordinary shares of Kymat Ltd. Mr. Kuria is able to borrow money at an annual compound rate of interest of 12%.

You are required:

(a) to estimate the cost of ordinary share capital and the weighted average cost of capital of Kymat Ltd and Rudat Ltd;
(4 marks)

(b) to explain briefly why both the cost of ordinary share capital and weighted average cost of capital of Kymat Ltd differ from those of Rudat Ltd;
(3 marks)

(c) to prepare calculations to demonstrate to Mr. Kuria how he might improve his position in the way he has suggested, stating clearly any reservations you have about the scheme; and (10 marks)

(d) to discuss the implications of your answers to (a), (b) and (c) above for the determination of a company's optimal financial structure in practice.
(8 marks)

(Total: 25 marks)

NUMBER TWO

The board of directors of Katrina plc is arguing about the company's dividend policy. Director A is in favour of financing all investment by retained earnings and other internally generated funds. He argues that a high level of retentions will save issue costs, and that declaring dividends always results in a fall in share price when the shares are traded ex div.

Director B believes that the dividend policy depends upon the type of shareholders that the company has, and that dividends should be paid according to shareholders' needs. She presents data relating to the company's current shareholders.

Rutherford plc: analysis of shareholding

	Number of shareholders	Shares held **(million)**	**% of total shares held**
Pension funds	203	38.4	25.1
Insurance companies	41	7.8	5.1
Unit and investment trusts	53	18.6	12.1
Nominees	490	32.4	21.2
Individuals	44,620	55.9	36.5
	45,407	153.1	100.0

She argues that the company's shareholder 'clientele' must be identified, and dividends fixed according to their marginal tax brackets.

Director C agrees that shareholders are important, but points out that many institutional shareholders and private individuals rely on dividends to satisfy their

current income requirements, and prefer a known dividend now to an uncertain capital gain in the future.

Director D considers the discussion to be a waste of time. He believes that one dividend policy is as good as other, and that dividend policy has no effect on the share price.

You are required to discuss critically the arguments for each of the four directors using both the information provided and any other evidence on the effect of dividend policy on share price that you consider to be relevant.

NUMBER THREE

Kentag plc is contemplating a bid for the share capital of Jepkom plc. The following statistics are available:

	Kentag plc	**Jepkom plc**
Number of shares	14 million	45 million
Share price	Sh.8.40	Sh.1.66
Latest equity earnings	Sh.11,850,000	Sh.9,337,500

Kentag plc's plan is to reduce the scale of Jepkom plc's operations by selling off a division which accounts for Sh.1,500,000 of Jeokom plc's latest earnings, as indicated above. The estimated selling price for the division is Sh.10.2 million.

Earnings in Jepkom plc's remaining operations could be increased by an estimated 20% on a permanent basis by the introduction of better management and financial controls. Kentag plc does not anticipate any alteration to Jepkom plc's price/earnings multiple as a result of these improvements in earnings.

To avoid duplication, some of Kentag plc's own property could be disposed of at an estimated price of Sh.16 million.

Rationalisation costs are estimated at Sh.4.5 million.

You are required:

(a) to calculate the effect on the current share price of each company, all other things being equal, of a two-for-nine share offer by Kentag plc, assuming that Kentag plc's estimates are in line with those of the market;

(10 marks)

(b) to offer a rational explanation of why the market might react to the bid by valuing Jepkom plc's shares at (i) a higher figure and (ii) a lower figure than that indicated by Kentag plc's offer even though the offer is in line with market estimates of the potential merger synergy. (5 marks)

(c) Assume that Kentag plc is proposing to offer Jepkom plc shareholders the choice of the two-for-nine share exchange or a cash alternative.

You are required to advice Kentag plc whether the cash alternative should be more or less than the current value of the share exchange, giving your reasons.
(5 marks)

(d) Assume now that Kentag plc, instead of making a two-for-nine share exchange offer, wishes to offer an exchange which would give Jepkom plc shareholders a 10% gain on the existing value of their shares.

You are required to calculate what share exchange would achieve this effect, assuming the same synergy forecasts as before.
(5 marks)

(Total: 20 marks)

NUMBER FOUR

(a) Discuss briefly four techniques a company might use to hedge against the foreign exchange risk involved in foreign trade.
(8 marks)

(b) Fien is a medium-sized UK company with export and import trade with the USA. The following transactions are due with the next six months. Transactions are in the currency specified.

Purchases of components, cash payment due in three months: £116,000
Sales of finished goods, cash receipt due in three months: $197,000
Purchase of finished goods for resale, cash payment due in six months: $447,000
Sale of finished goods, cash receipt due in six months: $154,000

Exchange rates (London market)

	£
Spot	1.7106 – 1.7140
Three months forward	0.82 – 0.77 cents premium

Six months forward 1.39 – 1.34 cents premium

Interest rates

Three months or six months	**Borrowing**	**Lending**
Sterling	12.5%	9.5%
Dollars	9%	6%

Foreign currency option prices (New York market)
Prices are cents per £, contract size £12,500

	Calls			**Puts**		
Exercise price ($)	**March**	**June**	**September**	**March**	**June**	**September**
1.60	-	15.20	-	-	-	2.75
1.70	5.65	7.75	-	-	3.45	6.40
1.80	1.70	3.60	7.90	-	9.32	15.35

Assume that it is now December with three months to expiry of the March contract and that the option price is not payable until the end of the option period, or when the option is exercised.

You are required:

(i) to calculate the net sterling receipts/payments that Fien might expect for both its three and six month transactions if the company hedges foreign exchange risk on:

the forward foreign exchange market;

the money market. (7 marks)

(ii) If the actual spot rate in six months time was with hindsight exactly the present six months forward rate, calculate whether Fien would have been better to hedge through foreign currency options rather than the forward market or money market. (7 marks)

(iii) to explain briefly what you consider to be the main advantage of foreign currency options.

(3 marks)

(Total: 25 marks)

NUMBER FIVE

(a) A company operating in a country having the dollar as its unit of currency has today invoiced sales to the United Kingdom in sterling, payment being due three months from the date of invoice. The invoice amount is £3,000,000 which, at today's spot rate of 1.5985 is equivalent to $4,795,500.

It is expected that the exchange rate will decline by about 5% over the three month period and in order to protect the dollar proceeds from the sale, the company proposes taking appropriate action through either the foreign exchange market or the money market.

The $/£ three-months forward exchange rate is quoted as 1.5858-1.5873. the three-months borrowing rate for Eurosterling is 15.0% and the deposit rate quoted by the company's own bankers is currently 9.5%.

You are required to

Explain the alternative courses of action available to the company, with relevant calculations to four decimal places, and to advise which course of action should be adopted. (15 marks)

(b) You are required to discuss whether a multinational company should hedge translation exposure by incurring transaction exposure.
(10 marks)

(c) Explain briefly what is meant by foreign currency options and give examples of the advantages and disadvantages of exchange traded foreign currency options to the financial manager. (5 marks)

(Total: 30 marks)

ANSWERS

NUMBER ONE

(Tutorial note: this question requires a demonstration of the arbitrage process. In part (d) a brief overview of the weakness of the M and M no tax position must be given.)

(a) **Cost of capital**

(i) **Kymat plc**

Since the profits and hence dividends are expected to remain constant, the fomula $Vo = \frac{d}{i}$ is applicable.

Where Vo = ex div share price
d = dividend per share
i = cost of ordinary share capital

Annual profit = Sh.500,000

∴ Dividend per share $\frac{Sh.500,000}{1,000,000}$ = 50p per share

Market price = Sh.3 per share cum div
∴ Sh.2.50 per share

Applying above formula, $2.50 = \frac{0.50}{i}$

(ii) **Rudat plc**

Ordinary share capital

	Sh.
Annual profit	500,000
Less: Debenture interest	150,000
Available for dividends	350,000
∴ Dividend per share	0.35

Applying above formula, $1.40 = \frac{0.35}{i}$

$$i = \frac{0.35}{1.40} = 0.25 or 25\%$$

(iii) Rudat plc: weighted average cost of capital

Source	Market value Sh.'000	Proportion	Cost of capital %	WACC %
Equity	1,400	0.528	25	13.20
Debentures	1,250	0.472	12	5.66
	2,650	1.000		18.86

(iv) Summary of results:

	Cost of ordinary share capital %	Weighted average cost of capital %
Kymat plc	20	10
Rudat plc	25	18.86

(b) **Explanation of differences in cost of ordinary share capital and weighted average cost of capital**

From the data given the difference in the cost of ordinary share capital must be easily explained in terms of the different gearing of the two companies. The effect of the high gearing of Rudat plc is to increase the level of financial risk and, therefore, decreased relative attractiveness of the ordinary shares.

This may be explained in terms of the objectives with which investors acquire and ordinary shares. In the first place investors will seek to maximize their return. However at the same time investors are in general averse to risk and, therefore, will seek to minimize the uncertainty of the variance of the returns about their expected values.

In any business investment there must be an element of business risk. The effect of a company using borrowing to increase its financial gearing is to magnify the effect of such business risk. This is because of the fixed nature of interest charges, which must be borne irrespective of the level of profitability

and which, leaves a smaller margin of equity investment to carry the same absolute levels of variation in return.

Because, as indicated above, investors are averse to such uncertainty, they will demand a higher rate of return to compensate them for the higher level of uncertainty. This clearly explains why the cost of equity of Rudat plc, (25%) is higher than that of Kymat plc, (20%).

However, two American writers, Modigliani and Miller have taken this a stage further and used a quantitative analysis to suggest that the relationship between the increasing costs of equity and the benefits of introducing cheaper debt finance must exactly cancel each other out (in the absence of taxation). The mechanism by which this takes place is known as the arbitrage process and is, indeed, described in the example below. This being so, the difference in the weighted average cost of capital of the two companies must be explained in one of three ways:

(i) The situation is an unstable one which will be rectified by investors carrying out arbitrage operations so as to take advantage of the gains which are available to them.

The data given does not coincide with investors' evaluations of the two companies and they are not, in fact, seen as identical (for example their respective earnings are subject to differing degrees of business risk).

The basic assumptions in the Modigliani-Miller hypothesis are not valid, and the data reflects their invalidity.

Any one of these three would provide an explanation. Despite a number of studies, the difficulty of evaluating data means there is as yet no conclusive evidence on the validity of the Modigliani-Miller hypothesis.

(c) **Mr Kuria**

(i) Present annual income 50,000 x Sh.0.35 = Sh 17,500

Market value of holding 50,000 x Sh 1.40 = Sh 70,000

Amount to be borrowed

Mr Kuria's level of risk will be unchanged if he employs personal gearing to the same extent as Rudat plc i.e, so that debt is 47.2% of total capital or so that debt and own funds are in the ratio 1250:1400 or 625:700. amount to be borrowed is therefore $\frac{625}{700} x 70{,}000 = Sh.62{,}500$

(iv) Number of shares to be purchased.

Total capital available = Sh 132,500 Sh (70,000 + 62,500)

Number of shares in Kymat plc which can be purchased (ex div)

$$\frac{132{,}500}{2.5} = 53{,}000$$

(v)

Annual income following the scheme		Sh
Dividend receipts 53,000 @ 50p		26,500
Less: Interest @ 12% on Sh 62,500		7,500
Net income	19,000	

Mr Kuria's annual income would therefore increase by £1,500 or 8.5% as a result of the scheme.

(vi) Reservations

The level of gearing in Rudat plc is high. By adopting a similar high personal level of gearing Mr Kuria is accepting a high risk from which he has no limited liability.

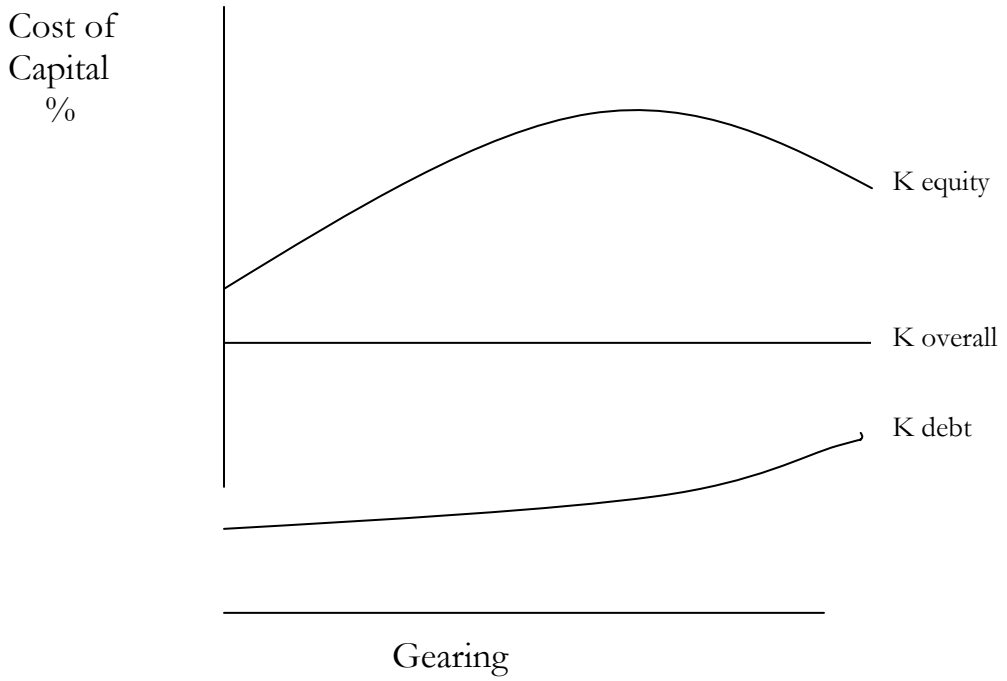
Mr Kuria may find it difficult to borrow such a large sum unless he provides additional security. The cost may well be greater than the company's borrowing rate.

Other investors may see the possibility of providing additional income by the same process thus increasing the share price of Kymat. Mr. Kuria may therefore be required to pay the higher price thus reducing his anticipated increase.

Transaction costs have been ignored.

(d) Implications for the determination of the company's optimum financial structure.

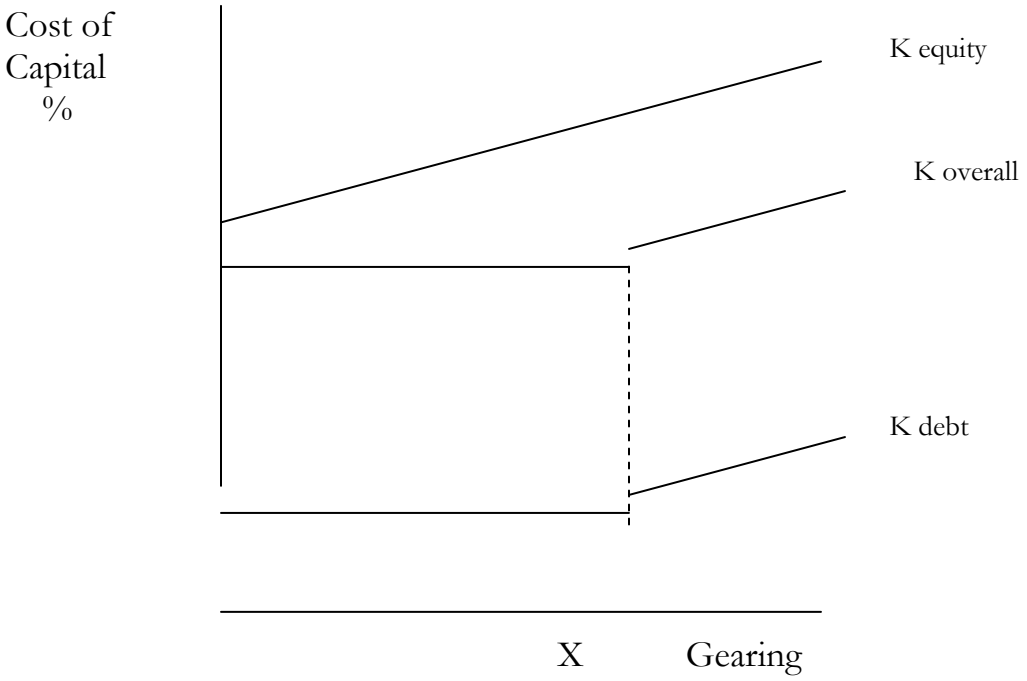
In the absence of taxation the Modigliani-Miller thesis suggests that the company should be indifferent as between differing capital structures.



This view changes dramatically if we introduce the effects of taxation. If the Modigliani-Miller view is still accepted, then the cost of capital will decline at a gradient which is equal to the marginal rate of tax saving on the debt finance being introduced.

The Modigliani-Miller view conflicts with the traditional view, which suggested that the judicious use of debt finance could, in fact, lower the weighted average cost of

capital so that a company could achieve an optimal financing structure, even without considering the effects of taxation.



There is no doubt that given their assumptions the Modigliani-Miller analysis is correct. The question, therefore, lies in terms of the assumptions. These may be summarized as follows:

(i) Company shares are traded in an efficient market. This means that if an opportunity arises for investors to improve their position without increasing their risk, they will recognize and take such opportunities. The level of transaction costs is so low as to be immaterial

In practice, there is considerable doubt as to whether the securities market is a sufficient approximation to an efficient market for such a process to work with any degree of reliability.

The thesis also presumes that investors can borrow and lend at the same interest rates as companies. This is unlikely for private investors who must operate at a disadvantage as against major corporate investors. This is emphasized within the UK by the legal structure and the difficulty of providing security on individual borrowings. On the other hand, in practice a significant proportion of investors are themselves institutional in nature and for these investors borrowing rates are likely to be similar to those of the companies in which they invest.

At high levels of gearing the cost of borrowed funds for the company is itself likely to start rising as the level of risk for lenders significant. In order to maintain the hypothesis of a constant weighted average cost of capital, Modigliani-Miller introduced the idea of 'risk-seeking' investors who would be attracted by the high levels of financial leverage, and would enter the market to buy shares in highly geared companies, thereby lowering the cost of equity. There is no evidence to support this view, which seems highly improbable. However, it is not of great practical significance as most companies do not operate at the high levels of gearing where this would become important.

The analysis also assumes that personal taxes have no distorting impact upon returns to the investor. In practice many investors find that debt income is taxable at higher rates than equity income and this could make them reluctant to allow firms to take high levels of gearing. In this situation we would need to the corporation tax savings to the firm with the personal tax losses to its investors.

As indicated above the evidence on the validity of the Modigliani-Miller view is inconclusive. However, under either view in the presence of taxation there must be substantial advantages for companies introducing some elements of debt financing. The only question is the extent to which debt finance should be used. This is clearly made higher if the Modigliani-Miller view, rather than the traditional view, is acceptable. However, in practice the parameters are likely to be set by other factors, in particular, the attitude of the business managers to the uncertainty of running a highly geared company and putting their own jobs at risk. Therefore, although a theoretical conclusion may be elusive, a practical conclusion is to hand. This is that companies should borrow significant proportion of their financing requirements, and that the limitation is likely be put by the attitude to risk of the managers, rather than the investors of whose being they are purportedly acting.

NUMBER TWO

Answer Plan

(1) Director A: effects of a residual policy; advantages of using internal funds for investment; impact on ex div share price.

(2) Director B: tax effects of dividend policy; clientele effect.

(3) Director C: consideration of income requirements; relative risk of dividends and capital gains.

(4) Director D: effect of market imperfections.

(5) Conclusion.

Director A is in favour of financing all investment by retained earnings and other internally generated funds. This will probably entail the company following a residual dividend policy whereby any funds remaining after all investments are undertaken are paid out as dividends. Such a policy is based on the assumption that shareholders will prefer the company to reinvest attributable earnings, provided the return so earned exceeds any possible alternative return which the investors could otherwise achieve. However, there are the following limitations associated with this policy:

(i) Since dividends represent the balance of earnings after all worthwhile investments have been undertaken, they will necessarily fluctuate from year to year, depending on the level of investment available. In some years dividends will be zero, whereas in other years they could be fairly substantial unless the company chooses to retain earnings for a future year. Such fluctuations in dividends may not suit certain investors.

(ii) In order for a policy of fluctuating dividends to be accepted, shareholders must fully understand the company's policy and have confidence in its investment criteria. This involves the free flow of information which only exist in a perfect market. Thus in the real world a policy of fluctuating dividends could reduce investor confidence and depress the share price.

(iii) Finally a residual payment policy could lead to the company deviating from its optional capital structure of debt to equity.

However, there are major cost savings and benefits which arise through the use of retained earnings for investment.

(i) The raising of new finance externally involves high issue costs which are eliminated with the use of internal funds.

(ii) The issue of new equity except in the case of a rights issue, dilutes the control of existing shareholders.

(iii) Advance corporation tax is payable on dividends which may be irrecoverable in certain circumstances or, if not, is disadvantageous inasmuch as it represents an adverse timing effect on tax payments. Therefore a low dividend payment policy is preferable.

(iv) Certain investors may prefer returns to be mainly in the form of capital gains due to the tax effects. Although capital gains and income are taxed at the same marginal rate, investors may still have a preference for capital gains due to the

annual exemption and the fact that tax is not payable until the gain is realized. Return in the form of capital gain would be achieved through a low dividend payout policy.

The share price does usually fall once a dividend has been declared and the shares are traded ex-dividend. But that fall in value usually reflects the fact that the forthcoming dividend no longer accompanies that share and thus the fall in value equates with the declared dividend. There is thus no associated decrease in the underlying value of the share.

Director B believes that the dividend policy should be tailored to the needs of individual shareholders. Since capital gains and income are taxed at the same marginal rate, all tax paying shareholders will prefer returns by way of dividends due to the associated tax credit. However, this will be complicated slightly by the existence of an annual exemption on capital gains. Any non-tax paying shareholders will likewise show a preference for dividends, since they will be able to reclaim the ACT (or tax credit) paid by the company. But, as was mentioned above, the tax advantage of capital gains may lie in the fact that tax is payable only when the gain is realized. The different shareholders may therefore have differing preferences concerning dividend policy.

The idea of the clientele effect, however, counters any argument of reviewing dividend policy. It suggests that through following a certain set dividend payout strategy the company has attracted a clientele of shareholders to whom this policy is suited. Therefore no benefit would be desired through attempting to alter the policy to meet individual preferences.

Director C suggests that many shareholders rely on dividends in order to satisfy current income requirements. An alternative exists, whereby shares could be sold in order to realize the capital gain and thus provide income. However, this is not equivalent to a dividend payment since transactions costs would be involved, share holdings would be diluted and such an action could be tax disadvantageous as discussed above. Thus Director C is correct in his assessment and a constant stable dividend policy is what is required.

However, Director C's second point concerning risk is fallacious. A capital gain should be compared with total dividend payments not simply the current dividend and therefore both capital gains and dividends relate to future periods and are uncertain. In addition, both dividends and gains are determined by the same factors. They are both generated by the cash flows produced by the

company and these cash flows are determined by the company's investment strategy.

Director D is a proponent of the dividend irrelevancy hypothesis which states that a company's value is dependent on the future earnings stream but independent of the particular dividend payment policy. In theory this hypothesis is correct, but it is dependent on perfect capital market conditions, which clearly do no exist in practice. Several market imperfections have already been discussed above which suggest that dividend policy is important.

These include the following:

(i) the information content of dividends;
(ii) the existence of transactions costs;
(iii) the existence of issue costs on raising new finance;
(iv) the clientele effect;
(v) taxation considerations.

There are in reality many factors to take into consideration in determining an optimal dividend policy, and despite considerable research into the subject, no absolute conclusion has been reached on the effect of dividend policy on share valuation.

NUMBER THREE

(a) We need to calculate the theoretical market capitalization of the Kentag group after the merger.

Jepkom's initial earnings post-merger = Sh 9.3375m - Sh 1.5m = Sh 7.8375m

Kentag believes that these can be improved by 20%, so

Jepkom's maintainable earnings post-merger = Sh 7.8375m x 1.2 = Sh 9.405m

Jepkom's P/E ratio remains at $\frac{166p}{Sh.9.3375m \div 45m} = 8$

∴ Value of Jepkmo's earnings = 8 x Sh 9.405m = Sh 75.24m.

The combined group therefore has the following value:

	Sh m
Kentag current market capitalization (14m x Sh 8.40)	117.6
Gain on disposal of property	16.0
Rationalisation costs	(4.5)
Disposal of Jepkom division	10.2
Jepkom's earnings stream	75.24
	214.54

To obtain Jepkom's 45m shares, Kentag must issue

$\frac{2}{9}$ x45m = 10m additional shares.

Kentag therefore will have 14m + 10m = 24m shares in issue.

Each share has a theoretical value of $\frac{\text{Sh.214.54m}}{\text{24m}}$ = S*h.*8.94

The effect on the share price of Kentag is a rise of Sh 8.94 - Sh 8.40 = Sh.0.54

Each Jepkom share has a theoretical value of $\frac{2}{9}$ xSh.8.94 = S*h.*1.99. The effect on the share price of Jepkom is a rise of Sh 1.99 - Sh 1.66 = 33p.

(b)

(i) The market might value Jepkom's shares after the bid higher than the theoretical bid price because they believe that ultimately Kentag will have to pay more than currently offered for Jepkom. Perhaps there are other potential bidders who will be attracted into the contest by Kentag's bid, and competitive pressures from the other bidders will push the price up. Perhaps Jepkom's shareholders are loyal to the company and sense that they need to be substantially rewarded for giving up their shares because of what they regard as an attractive future for Jepkom as an independent company.

(ii) The market might value Jepkom's shares after the bid lower than the theoretical bid price because they believe that the bid will fail. If Jepkom's shares are substantially held by the founding family's interests who would not sell at any price, the bid would largely be ignored by the market.

In theory Kentag should pay for Jepkom a price of one pound greater than the next available offer. If there are no other offers forthcoming, very little premium to the current market price need be paid, and all the synergistic benefits can accrue to the previous shareholders of Provincial.

(c) A cash alternative offers both advantages to potential acceptors of Kentag's offer. One advantage is that of certainty. Cash has a known value, which can be invested in risk-free securities to offer a safe return. Shares offer a value which can vary from day to day in line with the vagaries of the market, and could fall swiftly if the anticipated merger benefits fail to materialize. Another advantage of cash is that it offers Jepkom shareholders an exit from their shares without having to pay transaction costs.

The disadvantage of cash is that a tax liability might arise for the shareholder on the forced disposal of his shares. However this depends on the tax status of the shareholder.

Indeed the relative attraction of cash over shares will depend strongly on the type of shareholders who are dominant (eg, charities, institutions, private investors etc) and their attitude to risk. For example charities are tax exempt and are generally risk-averse so might favour cash over shares.

In practice the cash alternative is generally set lower than the bid price implied by shares, but it would be worthwhile Kentag Provincial carrying out research into the types and beliefs of Jepkom's shareholders before a final decision was taken.

(d) National's existing share price is Sh.1.66 per share.
At 10% gain implies a share price of 1.66 x 1.1 = Sh.1.826 per share.

There are 45m shares in issue to be each rewarded with Sh.1.826 per share, so the total value given to Jepkom's shares is:

45m x Sh.1.826 = Sh 82.17m

The Jepkom shareholders therefore deserve $\frac{82.17}{214.54} = 38.3\%$ of the shares in the enlarged group.

The number of new Kentag shares to be issued is $\frac{38.3}{100-38.3} \text{x} 14\text{m} = 8.69\text{m}$

8.69 million new shares are issued to compensate 45m old shares, a share exchange of 1 new share for every 5.178 old share held.

The Kentag shareholders therefore deserve $\frac{82.17}{214.54} = 38.3\%$ of the shares in the enlarged group.

8.69 million shares are issued to compensate 45m old shares, a share exchange of 1 new share for every 5.178 old shares held.

NUMBER FOUR

(a) The following techniques are available for hedging against the foreign exchange risk involved in foreign trade (note that only four were required):

(i) **Forward market**

This involves a contract which is tailor-made i.e, is taken out for the exact amount of currency required. The future rate of exchange is fixed at the time the contract is entered into with the bank. The cost is determined by the forward rate quoted by the bank. The contract must be fulfilled on the due date (or within the due dates for an option forward contract). Therefore if, for example, a customer is late in paying, the firm will have to buy currency in order to meet the commitment under the forward contract.

(ii) **Financial futures market**

This offers the opportunity to buy/sell currency in standard amounts of a limited number of currencies at a specified time and rate. It is therefore cheaper than using a forward contract but cannot usually obtain the exact amount of currency needed and requires an initial deposit.

(iii) **Lead/lad payment**

In the case of paying for goods in a foreign currency, it is possible to pay for the goods in advance and thereby fix the exchange rate at the spot rate.

The cost is the time value of money between the normal due date and the earlier payment date.

(iv) **Money market**

Here the currency is exchanged at the time of the initial transaction at the spot rate and the currency is then lent/borrowed on the money market so as to accrue to the appropriate amount to settle the transaction on the due date. The cost will be determined by the interest rate differential between the two countries.

(v) **Foreign currency options**

Here the firm buys the possibility of buying ('call') or selling ('put') currency at an agreed rate, usually at any time within a specified period. It is possible to obtain a choice of exercise prices and maturity dates; the price of the option will vary according to the exercise price and maturity date chosen.

Because options give the holder the opportunity to 'walk away' from the contract if it suits him, options are a more expensive means of covering foreign exchange risk.

(vi) **Invoice in the domestic currency**

For exports it is possible to invoice in the domestic currency. This is easier for the exporter but it passes the inconvenience and risk of foreign exchange on to the customer so it may result in lower sales.

(b) (i) **Fien**

Three months	Six months
£116,000 payment	$447,000 payment
$197,000 receipt	$154,000 receipt
	$293,000 payment

(1) **Forward market**

Three months: contract to sell $:

$$\$\frac{197{,}000}{1.714 - 0.0077} = £115{,}454 \text{ receipt in three months}$$

∴ Net payment = 116,000 – 115,454

$= \underline{£546}$

Six months: contract to buy $:

$\$\frac{293{,}000}{1.7106 - 0.0139}$ $= £172{,}688$ payment

(2) **Money market**

Three months: borrow

$\$\frac{197{,}000}{\left(1 + \frac{0.09}{4}\right)}$ $= \$192{,}665$

Convert at spot:

$\$\frac{192{,}665}{1.714}$ (i.e, sell $) $= £112{,}407$ now – invest

For three months:

$£112{,}407 \text{x} \left(1 + \frac{0.095}{4}\right)$ $= £115{,}076$ in three months

∴ Net payment $= 116{,}000 - 115{,}076$

$= \underline{£924}$

Six months: Lending amount is calculated as:

$\$\frac{293{,}000}{\left(1 + \frac{0.06}{2}\right)}$ $= 284{,}467$

∴ Need to buy $ now – Cost $\$ \frac{284{,}467}{1.7106}$

Borrow £ for six months, have to repay:

$$£166{,}296 \times \left(1 + \frac{0.125}{2}\right) \qquad = £176{,}690$$

(ii) **Foreign currency options**

Six months have to pay $293,000

Therefore, need option to sell/put £ in six months.

Option to sell at $1.70

Net to put $\$\frac{293{,}000}{1.70}$ = £172,353 i.e, $\frac{172{,}353}{12{,}500}$

= 13.8 (14 contracts)

(Tutorial note: this does not provide enough $ because the price of the option is payable in $ but it would be a good enough estimate in the examination and in fact is cheaper than going to fifteen contracts to obtain the full $ requirement.)

	$	£
Cost 12,500 x 14		175,000
Yields 175,000 x 1.70	297,500	
Option price 175,000 x 0.0345	(6,038)	
	(293,000)	
Pay supplier	(1,538)	
$ shortfall		
Cost $\frac{\$1{,}538}{1.7106 - 0.0139}$		906
		175,906

If spot in six months, to sell £i.e, buy $, is:

1.7106 – 0.0139 = $1.6967

it would be best to exercise option at $1.70.

Option to sell at $1.80

Need to put $\frac{\$293{,}000}{1.80}$ = £162,778

= 13.02 contracts

Use 13 contracts:

	$	£
Cost 12,500 x 13		162,500
Yields 162,500 x 1.80	297,500	
Option price 162,500 x 0.0932	(15,145)	
	(293,000)	
Pay supplier	(15,645)	
$ shortfall		
Cost $\frac{\$15,645}{1.7106 - 0.0139}$		9,221
		171,721

Again at a spot of $1.6967 it is better to exercise the option.

Overall the company, with the benefit of hindsight, would have been best to hedge through the $1.80 foreign currency options.

(iii) The advantage foreign currency options have over other methods of covering exchange risk is that they offer the opportunity to take advantage of beneficial movements in the exchange rate i.e, if the rate moves against the holder of the option, the option can be exercised (to cover the 'downside risk') whereas if the rate moves in favour of the holder, the holder can allow the option to lapse and instead profit from the favourable movement in the exchange rate. This is not possible with a forward or futures contract.

NUMBER FIVE

(a) There are two courses of action available to the company: forward market cover or money market cover. These are considered in turn below.

Forward market cover

The company is to receive £3,000,000 in 3 months' time. Therefore in order to fix the exchange rate at that point in time (and the resultant dollar proceeds) the company could arrange to sell the sterling forward by setting up a forward contract.

The forward exchange rate is quoted as $1.5858 - $1.5873/£. The relevant rate for selling forward £ would be $1.5858/£ (which yields the smaller figure for $).

Therefore the forward sale of £3,000,000 would yield

£3,000,000 x $1.5858/£ = $4,757,400.

Exchange rate risk has been eliminated since the dollar receipt of $4,757,400 is guaranteed. In addition, even if the future spot rate of $1.5186/£($1.5985 x 95%) were certain, forward market cover would be preferable, since the latter 3 month spot rate would yield only

£3,000,000 x $1.5186/£ = $4,555,800

However, with the forward market cover there remains a shortfall over the $ proceeds which would be expected on the basis of the current spot rate. This shortfall amounts to:

$4,795,500 - $4,757,400 = $38,100
(given in question)

Money market cover

Again exchange rate risk may be effectively eliminated by borrowing sterling which will amount to £3,000,000 with accrued interest in 3 months' time and converting this sterling at the current spot rate into $ for investment. The amount of dollars accrued in the deposit account after 3 months represents the effective dollar receipt, as shown below. The £ loan will be repaid when the invoice amount of £3,000,000 is received.

Borrow sterling @ 15% interest for 3 months (3.75%)

$\frac{3,000,000}{1.0375}$	£2,891,566
Convert to $ @ the spot rate	x$1.5985/£
Invest $ @ 9.5%	$4,622,168
Interest for 3 months (2.375%)	$ 109,777
Effective $ receipt	$4,731,945

As with forward market cover, this represents a shortfall over the $ receipt using the current spot rate, which amounts to

$4,795,500 - $4,731,945 = $63,555

Advice on course of action

Based on the initial computations, the forward market cover will convert the £3,000,000 receipt into $4,757,400 in 3 months' time, whereas the money market cover would yield $4,731,945. On this basis the forward market cover would be preferable as it gives the higher $ receipt. In addition it is completely riskless, whereas the money market cover relies on interest rates remaining constant over the 3-month period in order to eliminate exchange rate risk.

(b) Translation exposure relates to the consolidation of a foreign subsidiary's accounts into the group accounts. The group financial statements will be denominated in the currency of the parent company and any balances in the subsidiary's accounts denominated in its own currency will be subject to translation exposure. Such balances will usually be translated at the exchange rate prevailing at the balance sheet date. However, if exchange rates between the parent company's currency and the subsidiary's currency vary, then the parent company's valuation of such foreign currency items will vary over time, giving rise to translation risk or uncertainty. This will, however, only be converted into transactions risk, with a related cash-flow effect, if it is necessary for such foreign currency balances to be exchanged into the parent company currency, or if a foreign currency loan is required to be repaid by use of parent company funds. Therefore, translation exposure does not impose a major foreign exchange risk on a company, but merely impacts the accuracy of balance sheet items valued by use of an historic exchange rate.

The major link with transaction exposure relates to the method by which translation exposure may be hedged. The parent company may effectively finance the foreign subsidiary using its own funds or home currency funds, but such an action would give rise to potential transaction losses on exchange. In certain circumstances it is practical to provide a foreign subsidiary with capital from the parent company, as this may be cheaper than finance obtained from the country in which the subsidiary operates. However, there is little benefit to be derived from incurring such transaction exposure in order to hedge translation exposure.

(c) A foreign currency option gives the buyer of the option the right, but not the obligation, to buy or sell a currency at a specified rate of exchange at a specified time.

Advantages

(i) Foreign currency options limit downside risk whilst allowing companies to take advantage of favourable foreign exchange rate movements.

They are a useful hedge against risk when a company is unsure whether a future foreign exchange risk will occur, for example when tendering for a contract which it might not get, or issuing a price list in foreign currencies.

They provide an effective currency hedge, especially when foreign exchange markets are volatile.

Disadvantages

(i) Cost. A premium is payable when the option is arranged, no matter whether or not the option is exercised.

(ii) Exchange traded options are only available in a small number of currencies with specific expiry dates (OTC options are much more flexible).