Answers

1 **(a)** Rights issue price = 2·5 x 0·8 = $2·00 per share
Theoretical ex rights price = ((2·50 x 4) + (1 x 2·00)/5=$2·40 per share

(Alternatively, number of rights shares issued = $5m/$2·00 = 2·5m shares
Existing number of shares = 4 x 2·5m = 10m shares
Theoretical ex rights price per share = ((10m x 2·50) + (2·5m x 2·00))/12·5m = $2·40)

(b) Current price/earnings ratio = 250/32·4 = 7·7 times
Average growth rate of earnings per share = 100 x ((32·4/27·7)$^{0·25}$ – 1) = 4·0%
Earnings per share following expansion = 32·4 x 1·04 = 33·7 cents per share
Share price predicted by price/earnings ratio method = 33·7 x 7·7 = $2·60
Since the price/earnings ratio of Dartig Co has remained constant in recent years and the expansion is of existing business, it seems reasonable to apply the existing price/earnings ratio to the revised earnings per share value.

(c) The proposed business expansion will be an acceptable use of the rights issue funds if it increases the wealth of the shareholders. The share price predicted by the price/earnings ratio method is $2·60. This is greater than the current share price of $2·50, but this is not a valid comparison, since it ignores the effect of the rights issue on the share price. The rights issue has a neutral effect on shareholder wealth, but the cum rights price is changed by the increase in the number of shares and by the transformation of cash wealth into security wealth from a shareholder point of view. The correct comparison is with the theoretical ex rights price, which was found earlier to be $2·40. Dartig Co shareholders will experience a capital gain due to the business expansion of $2·60 – 2·40 = 20 cents per share. However, these share prices are one year apart and hence not directly comparable.

If the dividend yield remains at 6% per year (100 x 15·0/250), the dividend per share for 2008 will be 15·6p (other estimates of the 2008 dividend per share are possible). Adding this to the capital gain of 20p gives a total shareholder return of 35·6p or 14·24% (100 x 35·6/240). This is greater than the cost of equity of 10% and so shareholder wealth has increased.

(d) In order to use the dividend growth model, the expected future dividend growth rate is needed. Here, it may be assumed that the historical trend of dividend per share payments will continue into the future. The geometric average historical dividend growth rate = 100 x ((15·0/12·8)$^{0·25}$ – 1) = 4% per year.

(Alternatively, the arithmetical average of annual dividend growth rates could be used. This will be (5·5 + 0·0 + 7·4 + 3·5)/4 = 4·1%. Another possibility is to use the Gordon growth model. The average payout ratio over the last 4 years has been 47%, so the average retention ratio has been 53%. Assuming that the cost of equity represents an acceptable return on shareholders' funds, the dividend growth rate is approximately 53% x 10% = 5·3% per year.)

Using the formula for the dividend growth model from the formula sheet, the ex dividend share price = (15·0 x 1·04)/(0·1 – 0·04) = $2·60

This is 10 cents per share more than the current share price of Dartig Co. There are several reasons why there may be a difference between the two share prices. The future dividend growth rate for example, may differ from the average historical dividend growth rate, and the current share price may factor in a more reasonable estimate of the future dividend growth rate than the 4% used here. The cost of equity of Dartig Co may not be exactly equal to 10%. More generally, there may be a degree of inefficiency in the capital market on which the shares of Dartig Co are traded.

(e) The primary financial management objective of a company is usually taken to be the maximisation of shareholder wealth. In practice, the managers of a company acting as agents for the principals (the shareholders) may act in ways which do not lead to shareholder wealth maximisation. The failure of managers to maximise shareholder wealth is referred to as the agency problem.

Shareholder wealth increases through payment of dividends and through appreciation of share prices. Since share prices reflect the value placed by buyers on the right to receive future dividends, analysis of changes in shareholder wealth focuses on changes in share prices. The objective of maximising share prices is commonly used as a substitute objective for that of maximising shareholder wealth.

The agency problem arises because the objectives of managers differ from those of shareholders: because there is a divorce or separation of ownership from control in modern companies; and because there is an asymmetry of information between shareholders and managers which prevents shareholders being aware of most managerial decisions.

One way to encourage managers to act in ways that increase shareholder wealth is to offer them share options. These are rights to buy shares on a future date at a price which is fixed when the share options are issued. Share options will encourage managers to make decisions that are likely to lead to share price increases (such as investing in projects with positive net present values), since this will increase the rewards they receive from share options. The higher the share price in the market when the share options are exercised, the greater will be the capital gain that could be made by managers owning the options.

Share options therefore go some way towards reducing the differences between the objectives of shareholders and managers. However, it is possible that managers may be rewarded for poor performance if share prices in general are increasing. It is also possible that managers may not be rewarded for good performance if share prices in general are falling. It is difficult to decide on a share option exercise price and a share option exercise date that will encourage managers to focus on increasing shareholder wealth while still remaining challenging, rather than being easily achievable.

2 (a) Financial analysis

Fixed interest debt proportion (2006) = 100 x 2,425/ 2,425 + 1,600) = 60%
Fixed interest debt proportion (2007) = 100 x 2,425/(2,425 + 3,225) = 43%
Fixed interest payments = 2,425 x 0·08 = $194,000
Variable interest payments (2006) = 274 – 194 = $80,000 or 29%
Variable interest payments (2007) = 355 – 194 = $161,000 or 45%

(Alternatively, considering the overdraft amounts and the average variable overdraft interest rate of 5% per year:
Variable interest payments (2006) = 1·6m x 0·05 = $80,000 or 29%
Variable interest payments (2007) = 3·225m x 0·05 = $161,250 or 45%)
Interest coverage ratio (2006) = 2,939/ 274 = 10·7 times
Interest coverage ratio (2007) = 2,992/ 355 = 8·4 times
Debt/equity ratio (2006) = 100 x 2,425/ 11,325 = 21%
Debt/equity ratio (2007) = 100 x 2,425/ 12,432 = 20%
Total debt/equity ratio (2006) = 100 x (2,425 +1,600)/ 11,325 = 35%
Total debt/equity ratio (2007) = 100 x (2,425 +3,225)/ 12,432 = 45%

Discussion

Gorwa Co has both fixed interest debt and variable interest rate debt amongst its sources of finance. The fixed interest bonds have ten years to go before they need to be redeemed and they therefore offer Gorwa Co long term protection against an increase in interest rates.

In 2006, 60% of the company's debt was fixed interest in nature, but in 2007 this had fallen to 43%. The floating-rate proportion of the company's debt therefore increased from 40% in 2006 to 57% in 2007. The interest coverage ratio fell from 10·7 times in 2006 to 8·4 times in 2007, a decrease which will be a cause for concern to the company if it were to continue. The debt/equity ratio (including the overdraft due to its size) increased over the same period from 35% to 45% (if the overdraft is excluded, the debt/equity ratio declines slightly from 21% to 20%). From the perspective of an increase in interest rates, the financial risk of Gorwa Co has increased and may continue to increase if the company does not take action to halt the growth of its variable interest rate overdraft. The proportion of interest payments linked to floating rate debt has increased from 29% in 2006 to 45% in 2007. An increase in interest rates will further reduce profit before taxation, which is lower in 2007 than in 2006, despite a 40% increase in turnover.

One way to hedge against an increase in interest rates is to exchange some or all of the variable-rate overdraft into long-term fixed-rate debt. There is likely to be an increase in interest payments because long-term debt is usually more expensive than short-term debt. Gorwa would also be unable to benefit from falling interest rates if most of its debt paid fixed rather than floating rate interest.

Interest rate options and interest rate futures may be of use in the short term, depending on the company's plans to deal with its increasing overdraft.

For the longer term, Gorwa Co could consider raising a variable-rate bank loan, linked to a variable rate-fixed interest rate swap.

(b) Financial analysis

		2007	2006
Inventory days	(365 x 2,400)/23,781		37 days
	(365 x 4,600)/34,408	49 days	
Receivables days	(365 x 2,200)/26,720		30 days
	(365 x 4,600)/37,400	45 days	
Payables days	(365 x 2,000)/23,781		31 days
	(365 x 4,750)/34,408	51 days	
Current ratio	4,600/3,600		1·3 times
	9,200/7,975	1·15 times	
Quick ratio	2,200/3,600		0·61 times
	4,600/7,975	0·58 times	
Sales/net working capital	26,720/1,000		26·7 times
	37,400/1,225	30·5 times	
Turnover increase	37,400/26,720	40%	
Non-current assets increase	13,632/12,750	7%	
Inventory increase	4,600/2,400	92%	
Receivables increase	4,600/2,200	109%	
Payables increase	4,750/2,000	138%	
Overdraft increase	3,225/1,600	102%	

Discussion

Overtrading or undercapitalisation arises when a company has too small a capital base to support its level of business activity. Difficulties with liquidity may arise as an overtrading company may have insufficient capital to meet its liabilities as they fall due. Overtrading is often associated with a rapid increase in turnover and Gorwa Co has experienced a 40% increase in turnover over the last year. Investment in working capital has not matched the increase in sales, however, since the sales/net working capital ratio has increased from 26·7 times to 30·5 times.

Overtrading could be indicated by a deterioration in inventory days. Here, inventory days have increased from 37 days to 49 days, while inventory has increased by 92% compared to the 40% increase in turnover. It is possible that inventory has been stockpiled in anticipation of a further increase in turnover, leading to an increase in operating costs.

Overtrading could also be indicated by deterioration in receivables days. In this case, receivables have increased by 109% compared to the 40% increase in turnover. The increase in turnover may have been fuelled in part by a relaxation of credit terms.

As the liquidity problem associated with overtrading deepens, the overtrading company increases its reliance on short-term sources of finance, including overdraft, trade payables and leasing. The overdraft of Gorwa Co has more than doubled in size to $3·225 million, while trade payables have increased by $2·74 million or 137%. Both increases are much greater than the 40% increase in turnover. There is evidence here of an increased reliance on short-term finance sources.

Overtrading can also be indicated by decreases in the current ratio and the quick ratio. The current ratio of Gorwa Co has fallen from 1·3 times to 1·15 times, while its quick ratio has fallen from 0·61 times to 0·58 times.

There are clear indications that Gorwa Co is experiencing the kinds of symptoms usually associated with overtrading. A more complete and meaningful analysis could be undertaken if appropriate benchmarks were available, such as key ratios from comparable companies in the same industry sector, or additional financial information from prior years so as to establish trends in key ratios.

(c) Current receivables = $4,600,000
Receivables under factor = 37,400,000 x 30/365 = $3,074,000
Reduction in receivables = 4,600 – 3,074 = $1,526,000

Reduction in finance cost = 1,526,000 x 0·05 = $76,300 per year
Administration cost savings = $100,000 per year
Bad debt savings = $350,000 per year
Factor's annual fee = 37,400,000 x 0·03 = $1,122,000 per year
Extra interest cost on advance = 3,074,000 x 80% x (7% – 5%) = $49,184 per year
Net cost of factoring = 76,300 + 100,000 + 350,000 – 1,122,000 – 49,184 = $644,884

The factor's offer cannot be recommended, since the evaluation shows no financial benefit arising.

3 (a) Calculation of weighted average cost of capital

Cost of equity = 4·5 + (1·2 x 5) = 10·5%
The company's bonds are trading at par and therefore the before-tax cost of debt is the same as the interest rate on the bonds, which is 7%.
After-tax cost of debt = 7 x (1 – 0·25) = 5·25%
Market value of equity = 5m x 3·81 = $19·05 million
Market value of debt is equal to its par value of $2 million
Sum of market values of equity and debt = 19·05 + 2 = $21·05 million
WACC = (10·5 x 19·05/21·05) + (5·25 x 2/21·05) = 10·0%

(b) Cash flow forecast

Year	0	1	2	3	4	5	6
	$000	$000	$000	$000	$000	$000	$000
Cash inflows		700·4	721·4	743·1	765·3	788·3	
Tax on cash inflows			175·1	180·4	185·8	191·4	197·1
		700·4	546·3	562·7	579·6	596·9	(197·1)
CA tax benefits			125·0	125·0	125·0	125·0	125·0
After-tax cash flows		700·4	671·3	687·7	704·6	721·9	(72·1)
Initial investment	(2,500)						
Working capital	(240)	(7·2)	(7·4)	(7·6)	(7·9)	270·1	
Net cash flows	(2,740)	693·2	663·9	680·1	696·7	992·0	(72·1)
Discount factors	1·000	0·909	0·826	0·751	0·683	0·621	0·564
Present values	(2,740)	630·1	548·4	510·8	475·9	616·0	(40·7)

NPV = $500

The investment is financially acceptable, since the net present value is positive. The investment might become financially unacceptable, however, if the assumptions underlying the forecast financial data were reconsidered. For example, the sales forecast appears to assume constant annual demand, which is unlikely in reality.

Workings

Capital allowance tax benefits
Annual capital allowance (straight-line basis) = $2·5m/5 = $500,000
Annual tax benefit = $500,000 x 0·25 = $125,000 per year

Working capital investment

Year	0	1	2	3	4	5
Working capital ($000)	240	247·2	254·6	262·2	270·1	
Incremental investment ($000)		(7·2)	(7·4)	(7·6)	(7·9)	270·1

(c) The capital asset pricing model (CAPM) can be used to calculate a project-specific discount rate in circumstances where the business risk of an investment project is different from the business risk of the existing operations of the investing company. In these circumstances, it is not appropriate to use the weighted average cost of capital as the discount rate in investment appraisal.

The first step in using the CAPM to calculate a project-specific discount rate is to find a proxy company (or companies) that undertake operations whose business risk is similar to that of the proposed investment. The equity beta of the proxy company will represent both the business risk and the financial risk of the proxy company. The effect of the financial risk of the proxy company must be removed to give a proxy beta representing the business risk alone of the proposed investment. This beta is called an asset beta and the calculation that removes the effect of the financial risk of the proxy company is called 'ungearing'.

The asset beta representing the business risk of a proposed investment must be adjusted to reflect the financial risk of the investing company, a process called 'regearing'. This process produces an equity beta that can be placed in the CAPM in order to calculate a required rate of return (a cost of equity). This can be used as the project-specific discount rate for the proposed investment if it is financed entirely by equity. If debt finance forms part of the financing for the proposed investment, a project-specific weighted average cost of capital can be calculated.

The limitations of using the CAPM in investment appraisal are both practical and theoretical in nature. From a practical point of view, there are difficulties associated with finding the information needed. This applies not only to the equity risk premium and the risk-free rate of return, but also to locating appropriate proxy companies with business operations similar to the proposed investment project. Most companies have a range of business operations they undertake and so their equity betas do not reflect only the desired level and type of business risk.

From a theoretical point of view, the assumptions underlying the CAPM can be criticised as unrealistic in the real world. For example, the CAPM assumes a perfect capital market, when in reality capital markets are only semi-strong form efficient at best. The CAPM assumes that all investors have diversified portfolios, so that rewards are only required for accepting systematic risk, when in fact this may not be true. There is no practical replacement for the CAPM at the present time, however.

4 (a) Pecking order theory suggests that companies have a preferred order in which they seek to raise finance, beginning with retained earnings. The advantages of using retained earnings are that issue costs are avoided by using them, the decision to use them can be made without reference to a third party, and using them does not bring additional obligations to consider the needs of finance providers.

Once available retained earnings have been allocated to appropriate uses within a company, its next preference will be for debt. One reason for choosing to finance a new investment by an issue of debt finance, therefore, is that insufficient retained earnings are available and the investing company prefers issuing debt finance to issuing equity finance.

Debt finance may also be preferred when a company has not yet reached its optimal capital structure and it is mainly financed by equity, which is expensive compared to debt. Issuing debt here will lead to a reduction in the WACC and hence an increase in the market value of the company. One reason why debt is cheaper than equity is that debt is higher in the creditor hierarchy than equity, since ordinary shareholders are paid out last in the event of liquidation. Debt is even cheaper if it is secured on assets of the company. The cost of debt is reduced even further by the tax efficiency of debt, since interest payments are an allowable deduction in arriving at taxable profit.

Debt finance may be preferred where the maturity of the debt can be matched to the expected life of the investment project. Equity finance is permanent finance and so may be preferred for investment projects with long lives.

(b) Annual interest paid per foreign bond = 500 x 0·061 = 30·5 pesos
Redemption value of each foreign bond = 500 pesos
Cost of debt of peso-denominated bonds = 7% per year
Market value of each foreign bond = (30·5 x 4·100) + (500 x 0·713) = 481·55 pesos
Current total market value of foreign bonds = 16m x (481·55/500) = 15,409,600 pesos

(c) (i) Interest payment in one year's time = 16m x 0·061 = 976,000 pesos
A money market hedge would involve placing on deposit an amount of pesos that, with added interest, would be sufficient to pay the peso-denominated interest in one year. Because the interest on the peso-denominated deposit is guaranteed, Boluje Co would be protected against any unexpected or adverse exchange rate movements prior to the interest payment being made.
Peso deposit required = 976,000/ 1·05 = 929,524 pesos
Dollar equivalent at spot = 929,524/ 6 = $154,921
Dollar cost in one year's time = 154,921 x 1·04 = $161,118

(ii) Cost of forward market hedge = 976,000/6·07 = $160,790
The forward market hedge is slightly cheaper

(d) Boluje receives peso income from its export sales and makes annual peso-denominated interest payments to bond-holders. It could consider opening a peso account in the overseas country and using this as a natural hedge against peso exchange rate risk.

Boluje Co could consider using lead payments to settle foreign currency liabilities. This would not be beneficial as far as peso-denominated liabilities are concerned, as the peso is depreciating against the dollar. It is inadvisable to lag payments to foreign suppliers, since this would breach sales agreements and lead to loss of goodwill.

Foreign currency derivatives available to Boluje Co could include currency futures, currency options and currency swaps.

Currency futures are standardised contracts for the purchase or sale of a specified quantity of a foreign currency. These contracts are settled on a quarterly cycle, but a futures position can be closed out any time by undertaking the opposite transaction to the one that opened the futures position. Currency futures provide a hedge that theoretically eliminates both upside and downside risk by effectively locking the holder into a given exchange rate, since any gains in the currency futures market are offset by exchange rate losses in the cash market, and vice versa. In practice however, movements in the two markets are not perfectly correlated and basis risk exists if maturities are not perfectly matched. Imperfect hedges can also arise if the standardised size of currency futures does not match the exchange rate exposure of the hedging company. Initial margin must be provided when a currency futures position is opened and variation margin may also be subsequently required. Boluje Co could use currency futures to hedge both its regular foreign currency receipts and its annual interest payment.

Currency options give holders the right, but not the obligation, to buy or sell foreign currency. Over-the-counter (OTC) currency options are tailored to individual client needs, while exchange-traded currency options are standardised in the same way as currency futures in terms of exchange rate, amount of currency, exercise date and settlement cycle. An advantage of currency options over currency futures is that currency options do not need to be exercised if it is disadvantageous for the holder to do so. Holders of currency options can take advantage of favourable exchange rate movements in the cash market and allow their options to lapse. The initial fee paid for the options will still have been incurred, however.

Currency swaps are appropriate for hedging exchange rate risk over a longer period of time than currency futures or currency options. A currency swap is an interest rate swap where the debt positions of the counterparties and the associated interest payments are in different currencies. A currency swap begins with an exchange of principal, although this may be a notional exchange rather than a physical exchange. During the life of the swap agreement, the counterparties undertake to service each others' foreign currency interest payments. At the end of the swap, the initial exchange of principal is reversed.

Fundamentals Level – Skills Module, Paper F9
Financial Management

			Marks	*Marks*
1	**(a)**	Rights issue price	1	
		Theoretical ex rights price per share	2	
				3
	(b)	Existing price/earnings ratio	1	
		Revised earnings per share	1	
		Share price using price/earnings method	1	
				3
	(c)	Discussion of share price comparisons	3–4	
		Calculation of effect on shareholder wealth and comment	1–2	
			Maximum	5
	(d)	Average dividend growth rate	2	
		Ex div market price per share	2	
		Discussion	2	
				6
	(e)	Discussion of agency problem	4–5	
		Discussion of share option schemes	4–5	
			Maximum	8
				25
2	**(a)**	Discussion of effects of interest rate increase	3–4	
		Relevant financial analysis	1–2	
		Interest rate hedging	2–3	
			Maximum	7
	(b)	Financial analysis	5–6	
		Discussion of overtrading	4–5	
		Conclusion as to overtrading	1	
			Maximum	10
	(c)	Reduction in financing cost	2	
		Admininstration cost and bad debt savings	1	
		Factor's fee	1	
		Interest on advance	2	
		Net cost of factoring	1	
		Conclusion	1	
				8
				25

				Marks	Marks
3	**(a)**	Cost of equity		2	
		Cost of debt		1	
		Market value of equity		1	
		Market value of debt		1	
		WACC calculation		1	
					6
	(b)	Inflated cash flows		1	
		Tax on cash flows		1	
		Capital allowance tax benefits		1	
		Working capital – initial investment		1	
		Working capital – incremental investment		1	
		Working capital – recovery		1	
		Net present value calculation		1	
		Comment		1	
					8
	(c)	Explanation of use of CAPM		5–6	
		Discussion of limitations		6–7	
			Maximum		11
					25
4	**(a)**	Relevant discussion			7
	(b)	Market value of each foreign bond		3	
		Total market value of foreign bonds		1	
					4
	(c)	**(i)** Explanation of money market hedge		2	
		Illustration of money market hedge		2	
					4
		(ii) Comparison with forward market hedge			2
	(d)	Discussion of natural hedge		1–2	
		Description of other hedging methods		6–7	
			Maximum		8
					25