Answers

Diploma in Financial Management Examination – Module B
Paper DB1 incorporating subject areas: Financial Strategy; Risk Management   **June 2004 Answers**

Section A

1   **C** $K_e = (D_1/P_0) + g$
        $= (5\cdot0/50.0) + 0\cdot04$
        $= \underline{14\cdot0\%}$

Option A uses the formula $(D_1/P_0) - g = 6\cdot0\%$
Option B ignores the growth factor $(D_1/P_0) = 10\cdot0\%$
Option D expresses the dividend paid of £5 million as a percentage of the profit $= 25\cdot0\%$

2   **C** $8\cdot0 = X + 1\cdot2 (7 - X)$
        $X = 2\cdot0$
        $Y = 2\cdot0 + 1\cdot8 (7\cdot0 - 2\cdot0)$
        $Y = 11\cdot0$

Option A is $1\cdot8$ x risk premium $(7\cdot0 - 2\cdot0) = 9\cdot0$
Option B is $(1\cdot8/1\cdot2)$ x $7\cdot0 = 10\cdot5$
Option D is $1\cdot8$ x expected returns to the market $(7\cdot0) = 12\cdot6$

3   **B**

Market capitalisation of Arcturus plc (10 x £60m)	=	£600m
Market capitalisation of Mira plc (12 x £10m)	=	£120m
Market value per share of Arcturus plc (£600m/40m)	=	£15
No. of shares to be issued [(£120m x 1·25)/£15]	=	10·0m

Option A ignores the bid premium.
Option C takes the pre-tax profits as a basis for calculation (i.e. £80m and £14m)
Option D takes the operating profits as the basis for calculation (i.e. £100m and £20m)

4   **B**

The conversion value is (80 x £1·20)	=	£96·00
Conversion premium (£104 – £96)	=	£8
Conversion premium per share (£8/80)	=	£0·10

Option A takes the difference between the conversion value and the nominal value of the loan stock. [(£100 – £96)/80]
        $= £0\cdot05$
Option C takes the difference between the conversion value and the nominal value of the shares [(£96 – £80)/80]
        $= £0\cdot20$
Option D takes the difference between the issue price of the loan stock value and the nominal value of the shares [(£104 – £80)/80]
        $= £0.30$

5   **C**

6   **B**

7   **B**   The total annual cost is [(25,000/500) x £10] + [(500/2) x £2] + £100,000 = £101,000
        Option A takes account of the holding costs only [(500/2) x £2] + £100,000 = £100,500
        Option C does not take an average figure for the number of units in stock
        [(25,000/500) x £10] + [500 x £2] + £100,000   = £101,500
        Option D divides the total cost of the stocks by the EOQ rather than the number of stocks.
        [(100,000/500) x £10] + [(500/2) x £2] + £100,000   = £102,500

8   **D**

9   **C**

Year	Cash inflow	Discount rate 8%	Present value
1	10	0·93	9·30
2	110	0·86	94·60
			103·90

Option A ignores the interest receivable in the final year

Year	Cash inflow	Discount rate 8%	Present value
1	10	0·93	9·30
2	100	0·86	86·00
			95·30

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Option B uses a 10% discount rate

Year	Cash inflow	Discount rate 10%	Present value
1	10	0·91	9·10
2	110	0·83	91·30
			100·40

Option D calculates the market value as follows: 10/8 x £100   = £125·00

10 C

11 C

12 B   Using CAPM, the expected return for the equity shareholders is: $3\% + [0·8 (9\% - 3\%)] = 7·8\%$
The predicted market value of a share is:

P_0 = D_1/K_0
     = $\dfrac{40p}{0·078}$
     =   512·8 pence

Option A calculates the required return as $3\% + [0·8 \times 9\%] = 10·2\%$
The predicted market value of the share is:
     = $\dfrac{40p}{0·102}$
     =   392·2 pence

Option C multiplies the beta by the current market rate of return to obtain the expected return. $0·8 \times 9·0\% = 7·2\%$
The predicted market value of the share is:
     = $\dfrac{40p}{0·072}$
     =   555·6 pence

Option D multiplies the beta by the difference between the returns to the market and the risk-free rate $[0·8(9\% - 3\%) = 4·8\%]$
The predicted market value of the share is:
     = $\dfrac{40p}{0·048}$
     =   833·3 pence

13 C $6·2\% - [(0·8 - 0·2)/2]\% = 5·9\%$
A adds the difference between each type of interest rate to calculate the arbitrage benefit.
    $6·2\% - [(0·8 + 0·2)/2]\% = 5·7\%$
B represents the variable rate for Volans plc less half the difference between the fixed rates.
    $[6·2\% - (0·8/2)\%] = 5·8\%$
D represents the variable rate for Volans plc less half the difference between the variable rates.
    $[6·2\% - (0·2/2)\%] = 6·1\%$

14 C

15 A   The forward rate is $1·5595 – $0·0025 = $1·5570
The amount received is:
$500,000/$1·5570 = £321,130

Option B uses the lower spot figure and the lower premium figure in the calculations.
The forward rate is $1·5535 – $0·0025 = $1·5510
The amount received is:
$500,000/$1·5510 = £322,373

Option C uses the higher spot figure and the higher premium figure in the calculations.
The forward rate is $1·5595 – $0·0030 = $1·5565
The amount received is:
$500,000/$1·5565 = £321,234

Option D uses the lower spot figure and the higher premium figure in the calculations
The forward rate is $1·5535 – $0·0030 = $1·5505
The amount received is:
$500,000/$1·5505 = £322,477

16 D   An investor could invest in Singapore $ at 6% or invest in UK £. The interest rate in the UK must be 10·83% for the investor to be indifferent between the two options.

		$
Assume £100 is converted to Singapore $ at spot	=	238·200
Invested at 6·0% for three months	=	3·573
	=	241·773

Converted to UK £ at the forward rate ($241·773/$2·3540)   =   £102·707
Interest rate is 2·707% for 3 months or 10·83% per year.

Option A takes the three-month rate   =   2·71%
Option B takes the interest earned as 6% over three months.

		$
Assume £100 is converted to Singapore $ at spot	=	238·200
Invested at 6·0% for three months	=	14·292
		252·492

Converted to UK £ at the forward rate ($252·492/$2·3540)   =   £107·26

The interest rate is = 7·26%

Option C takes the 2·707% calculated above as the interest rate differential and adds this to the 6% interest rate = 8·71%

17 A

18 B   The option will be exercised as the exchange rate is below the strike price. A call option is required to buy euros.

		£
€1,000,000/€100 = 10,000 (x £0·50)	=	5,000
€1,000,000/€1·6142	=	619,502
Total cost	=	624,502

Option A uses the price of the put option rather than the cost of the call option in the calculations.
Option C uses the price of the put option rather than the cost of the call option in the calculations and uses the lower exchange rate.

		£
€1,000,000/€100 = 10,000 (x £0·40)	=	4,000
€1,000,000/€1·5834	=	631,552
Total cost	=	635,552

Option D uses the lower exchange rate.

		£
€1,000,000/€100 = 10,000 (x £0·50)	=	5,000
€1,000,000/€1·5834	=	631,552
Total cost	=	636,552

19 A

20 D

Section B

1 (a) Incremental cash flows

		Years				
		0	1	2	3	4
		£000	£000	£000	£000	£000
Cash inflows						
Sales	(15,000 x £22)		330·0	330·0	330·0	330·0
Cash outflows						
Machinery and equipment		(300·0)				
Redundancy savings		230·0				
Advertising			(50·0)	(50·0)	(50·0)	(50·0)
Materials	(15,000 x £7·5*)		(112·5)	(112·5)	(112·5)	(112·5)
Labour	(15,000 x £5·50)		(82·5)	(82·5)	(82·5)	(82·5)
Overheads	(15,000 x £3·50**)		(52·5)	(52·5)	(52·5)	(52·5)
		(70·0)	(297·5)	(297·5)	(297·5)	(297·5)
Net cash flows		(70·0)	32·5	32·5	32·5	32·5
Disc. rate 10%***		1·00	0·91	0·83	0·75	0·68
Present value		(70·0)	29·6	27·0	24·4	22·1
Net present value		33·1				

* The polymer cost is based on replacement cost rather than the original cost of this material.
** The overheads are decreased by the depreciation element [(£300,000/4)/15,000] = £5 per unit. The overhead figure per unit is, therefore, £8·50 – £5·00 = £3·50.
*** The discount factor represents the weighted average cost of capital [(0·5 x 12%) + (0·5 x 8·0%)] = 10%

(b) The required reduction in net cash flows from operations before the project becomes unprofitable is calculated as follows:

		£000
Let C = annual operating cash flows		
(C x annuity factor for a four-year period) – NPV	=	0
This can be re-arranged		
(C x annuity factor for a four-year period)	=	NPV
C x 3·17	=	£33,100
C	=	£10,442

(c) The calculations reveal that the project has a positive NPV and so acceptance will increase shareholder wealth. However, the calculations also reveal that the NPV is sensitive to relatively small changes in the forecast figures. An increase of less than 4% in the annual operating cash outflows would lead to the project becoming unprofitable. It is, therefore, worth checking the figures carefully before a final decision is made.

It is worth pointing out that the development and market research costs have been excluded from the calculations as they are sunk costs. However, consideration of this investment opportunity before these costs were incurred, assuming accurate forecasting, would have led to its rejection.

2 (a) Theoretical ex rights price

Earnings per share	(£21m/240m)	£0·0875
Market value per ordinary share	(16 x £0·0875)	£1·40

		£
Original shares 5 x £1·40		7·00
Rights share 1 x (£1·40 x 0·7)		0·98
		7·98
Value of a share following the rights issue	£7·98 /6	1·33

(b) Value of rights

	£
Value of share after rights issue	1·33
Cost of acquiring a rights share	0·98
Value of rights	0·35

(c) Evaluation of options

Take up rights offer

		£
Value of shares following rights issue [(10,000 + 2,000) x £1·33]		15,960
Less: Cost of purchasing rights shares	(2,000 x £0·98)	1,960
		14,000

Sell rights

		£
Value of shares following rights issue	(10,000 x £1·33)	13,300
Add: Sale of rights	(2,000 x £0·35)	700
		14,000

Allow rights offer to lapse

Value of shares after rights issue	(10,000 x £1·33)	13,300

The calculations indicate that the wealth of the investor will be unaffected whether a decision is made to take up the rights offer or to sell the rights. The only difference will be in the form that the investor's wealth will take. However, if the investor allows the rights offer to lapse, there will be a loss of wealth of £700. Thus, there is an incentive for the investor not to allow the offer to lapse. In practice, the business may sell the rights on behalf of the investor and then pass on the proceeds. However, it is under no obligation to do this.

(d) The business will be seeking to raise a particular sum when making a rights issue and this can be raised in various ways. In the case of Sagitta plc above, a one-for-five issue was made at an issue price of £0·98. However, the same amount could have been raised by a two-for-five issue at £0·49, a three-for-five issue at £0·327 etc. The price of the issue will not be critical in a competitive market as it should have no effect on the total value of the underlying assets of the business or the proportion of those assets owned by a particular shareholder. However, the business must ensure that the issue price is below the market value of the shares. Unless this is done, there will be no incentive to buy the shares and the issue will fail.

3 **(a)** *Cost of current credit management policy*

	£
Bad debts written off	175,000
Credit control department costs	120,000
Financing costs (90/365 x £18m x 12%)	532,603
	827,603

Cost of factoring debts

	£
Factor service charge (3% x £18m)	540,000
Factor finance charges [30/365 x (80% x £18m) x 10%]	118,356
Bank overdraft charges [30/365 x (20% x £18m) x 12%]	35,507
	693,863

Employing the services of a factor should lead to cost savings of £133,740 (i.e. £827,603 – £693,863)

(b) Debt factoring is a service that involves a financial institution taking over the sales ledger of a business. This means that it will take over the normal credit control functions of a business including debt collection. The financial institution, which is known as a factor, will usually be prepared to undertake credit investigations and to advise on the credit standing of potential customers if required. The service provided may or may not include responsibility for bad debts, which will depend on the particular agreement reached with the client. In addition to operating the sales ledger, the factor is usually prepared to offer finance to the client based on a maximum of 80% of approved trade debts.

Factoring has a number of advantages including:
– a well-managed credit control function
– a reduction in direct credit administration costs
– the opportunity to release key staff for other activities
– a ready source of finance that changes in line with changes in sales

However, factoring has potential disadvantages. It can prove to be an expensive service for some businesses (although in (a) above, the service resulted in a net saving) and it can lead to a loss of control over the sales ledger. Many businesses view their relationship with credit customers as vitally important and are reluctant to allow other businesses to become involved in any aspect of this relationship. Although it is possible to conceal a factoring relationship from customers, there is still a risk that decisions taken by the factor will have an adverse effect on customer relationships.

Invoice discounting involves a financial institution making a loan to a business based on the value of approved trade debts outstanding. The amount advanced is usually up to a maximum of 80 per cent of the face value of the debts and is due for repayment within a fairly short period – often 60 days. The amount due for repayment may be financed by amounts received from outstanding trade debtors upon which the loan was based, however, the amount owing must be paid irrespective of whether the trade debtors pay.

Invoice discounting does not result in the financial institution having an involvement in running the sales ledger; it is simply a source of finance. It can offer more flexibility than debt factoring and can be used by a business only when new finance is needed. There is no requirement for a continuing relationship as in the case of debt factoring. Invoice discounting can also be a cheaper source of finance than debt factoring. In recent years, invoice discounting has grown in popularity and is now a much more important source of short-term finance to businesses than debt factoring.

Section C

4 **(a)** No. of contracts = €10,540,000 /€125,000
= 84 (to nearest whole number)

Scenario 1
Buy immediately 84 contracts at   0·9750
Sell in three months' time 84 contracts at   0·9860

Gain per contract   110

		$
Total gain	84 x $12·50 x 110	115,500
Purchase of €10,540,000 in three months' time	€10,540,000 x 0·9998	10,537,892
Total cost		10,422,392

Hedge efficiency

		$
Target payment	€10,540,000 x 0·9812	10,341,848
Cash payment	€10,540,000 x 0·9998	10,537,892
Loss on the spot market		196,044
Futures gain		115,500
Hedge efficiency	115,500/196,044	58·9%

Scenario 2
Buy immediately 84 contracts at   0·9750
Sell in three months' time 84 contracts at   0·9580

Loss per contract   170

		$
Total loss	84 x $12·50 x 170	178,500
Purchase of €10,540,000 in three months' time	€10,540,000 x 0·9660	10,181,640
Total cost		10,360,140

Hedge efficiency

		$
Target payment	€10,540,000 x 0·9812	10,341,848
Cash payment	€10,540,000 x 0·9660	10,181,640
Gain on the spot market		160,208
Futures loss		178,500
Hedge efficiency	160,208/178,500	89·8%

(b)

	Scenario 1	Scenario 2
Exchange rate	€1 =$0·9998	€1 =$0·9660
Exercise price	€1 =$0·9900	€1 =$0·9900
Option exercised	Yes	No
	$	$
Amount paid		
(10,540,000 x 0·9900)	10,434,600	
(10,540,000 x 0·9660)		10,181,640
Option premium	210,800	210,800
	10,645,400	10,392,440

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(c) We can see that the purchase of futures contracts will be cheaper than the purchase of an option under each of the two scenarios that have been suggested. The hedge efficiency of the futures contract under Scenario 2 is higher than under Scenario 1.

(d) Futures contracts will fix the effective future exchange rate for which the euros will be purchased. They are legally binding contracts and so the US business is committed to buying euros, irrespective or whether the purchase of the French computer software business takes place. We are told in the question that the deal is subject to a satisfactory report from a firm of independent accountants and there is no certainty at this stage that the deal will be finalised. In a situation of uncertainty concerning foreign exchange needs, a currency option may prove to be more appropriate. This will give the US business the right, but not the obligation, to buy euros at a specified rate of exchange. If the euros are not required, the US business can allow the option to lapse, or, if it is advantageous, exercise the option for a profit.

5 **(a)** *Profits available for dividend*

	Existing capital structure £	Proposed capital structure £
Profits before interest and taxation	500,000	500,000
Interest payable (£3m x 0·05)	–	150,000
	500,000	350,000
Corporation tax (20%)	100,000	70,000
Profits available for dividend	400,000	280,000

Value of the company
The first step required is to ungear the beta of Diphda plc:
$$\beta_e = \beta_a\,[\{E + D\,(1 - t)\}/E]$$

Where:
β_a = asset beta
β_e = equity beta
E = equity proportion within capital structure
D = debt proportion within capital structure
t = corporation tax rate

$1·4 = \beta_a\,[\{70 + 30\,(1 - 0·20)\}/70]$
$1·4 = 1·34\beta_a$
$\beta_a = \underline{1·04}$

The cost of equity of Serpens plc using CAPM is:
$K_e = 4\% + 1·04(9\% - 4\%)$
$= 9·2\%$
The value of the company under each option can be calculated as follows:

Current policy
As the company is financed entirely by equity, the dividend valuation model can be used to derive a value for the company.
$P_0 = D_1/K_0$
$= £400,000/0·092$
$= £4,347,826$

Proposed policy
The value of the company, after taking on gearing, can be derived using the MM proposition that $Vg = Vu + Dt$

Where:
Vg = market value of the geared company
Vu = market value of the ungeared company
D = market value of debt
t = rate of corporation tax

Thus:

	£
Value of ungeared company	4,347,826
Value of debt (£3m x 0·2)	600,000
Value of geared company	4,947,826

(b) The effect of gearing on the value of a business has been the subject of intense debate. The traditional view is that, as the cost of loan capital is cheaper than the cost of equity share capital, the overall cost of financing the business can be reduced by taking on higher levels of gearing. As a result, the value of the business can be increased. It is argued that the anticipated rate of return for equity shareholders and lenders will not be affected by fairly low levels of gearing. This is because they will not view the increases in gearing as having a significant effect on the level of risk to be borne and so will not require an increase in returns to compensate. This will result in a fall in the weighted average cost of capital, and therefore a rise in the value of the business. When, however, the level of gearing increases beyond a certain point, the level of risk is viewed as being significant and so equity shareholders and lenders will require an increase in their returns to compensate. This will result in a rise in the weighted average cost of capital and therefore a fall in the value of the business.

Modigliani and Miller (MM) challenged the above arguments. Their original position was that the value of the business is not influenced by the way in which it is financed and so it is not possible to increase the value of the business through additional gearing. The expected rate of return for equity shareholders will increase as soon as gearing is introduced and will rise in direct proportion to the level of gearing. This means that changes in the cost of equity shares will cancel out any changes from the introduction of lower cost loan capital and so the weighted average cost of capital, and therefore the value of the business, will remain the same. The MM view outlined above is based on a number of restrictive assumptions including perfect capital markets, no bankruptcy costs and no taxation. The last of these assumptions has been the subject of much criticism and led MM to revise their views to take account of taxation. Their position acknowledges that tax relief on loan capital represents an additional benefit to shareholders. As the amount of tax relief increases in line with the amount borrowed, the weighted average cost of capital will decline, and the value of the business will increase, as the level of gearing increases. Thus, the MM view moves closer to the traditional view outlined earlier insofar that both accept there is a relationship between the value of the business and the level of gearing.

6 (a) An external audit is carried out by an independent firm of accountants and is a legal requirement for all except the smallest limited companies. The purpose of the audit is to enable the auditors to express an opinion as to whether the financial statements give a true and fair view of the financial position and performance of the company and are properly prepared in accordance with the Companies Act 1985. This opinion is communicated to shareholders and others in the form of an audit report. Where the audit report contains an unqualified opinion, it should lend credibility to the financial statements, which are prepared by the directors of the company.

The auditors' report aims to provide shareholders and others with information of significant errors and omissions and so must include any instances where:
– the Directors' Report is inconsistent with the financial statements
– the company has failed to keep proper accounting records
– the auditors have not received all information and explanations necessary to carry out their audit
– information specified by regulatory bodies has not been disclosed.

In recent years, the external audit process has been extended for companies listed on the Stock Exchange. For such companies, the auditors must review whether the Corporate Governance statement complies with seven provisions of the Combined Code and must report where it does not.

The external audit does not cover all aspects of corporate governance or risk management. Thus, it does not require consideration of whether the statements of the Board of Directors concerning internal control are comprehensive or the effectiveness of the company's corporate governance procedures or risk and control procedures.

Internal audit is normally carried out by employees of the company, although the internal audit function can be outsourced to an external body, who will report to senior management. An internal audit is not required by law and the decision to implement internal audit procedures will involve the senior managers of a company weighing up the likely benefits and costs. The nature and purpose of an internal audit can vary between companies and the nature of the reports prepared will also, therefore, vary. An internal audit may involve various tasks including:
– providing feedback on the effectiveness of existing risk management and risk control processes. This will involve identifying weaknesses in these processes and making recommendations for improvement
– providing feedback on the implementation and operation of internal control systems
– reviewing the adequacy of accounting and financial information
– reviewing compliance procedures and making appropriate recommendations where weaknesses are identified.

Thus, internal auditors should provide senior managers with valuable advice, reassurance and assistance in relation to risk management, and monitoring and control systems operating within the company.

(b) The external auditors and internal auditors should co-operate with each other, particularly in relation to the external audit process. The internal auditors should ensure that the accounting and internal control procedures are robust and provide information of sufficient reliability to satisfy the external auditors. However, internal auditors may have a much wider remit than external auditors and may pursue much more detailed investigations in order to satisfy themselves that the process or function that is under scrutiny fulfils the criteria that have been established.

Section B

1	**(a)**	1 mark per correct item, 1 mark calculation of net cash flows, 3 marks discount calculations	12
	(b)	3 marks approach, 2 marks calculations	5
	(c)	1 mark per point	3
			20

2	**(a)**	1 mark EPS, 1 mark MV per share, 3 marks TERP	5
	(b)	1 mark value figure, 1 mark cost figure, 1 mark calculation of value	3
	(c)	2 marks buy calculation, 2 marks sell calculation, 1 mark do nothing calculation, 3 marks comments	8
	(d)	2 marks per point	4
			20

3	**(a)**	4 marks existing policy, 8 marks factoring	12
	(b)	4 marks factoring, 4 marks invoice discounting	8
			20

Section C

4	**(a)**	6 marks cost, 4 marks efficiency	10
	(b)	2 marks per scenario	4
	(c)	Marker's discretion	2
	(d)	2 marks degree of certainty (max. 4 marks)	4
			20

5	**(a)**	2 marks profit available to equity, 3 marks equity beta, 2 marks cost of equity, 2 marks existing value 2 marks value under proposed structure	11
	(b)	3 marks traditional, 4 marks MM without taxes, 2 marks MM with taxes	9
			20

6	**(a)**	8 marks external audit, 8 marks internal audit	16
	(b)	2 marks per point	4
			20