Answers

1 (a) Calculating the net present value of the investment project using a nominal terms approach requires the discounting of nominal (money terms) cash flows using a nominal discount rate, which is given as 12%.

Year	1	2	3	4	5
	$000	$000	$000	$000	$000
Sales revenue	1,308·75	2,817·26	7,907·87	5,443·58	
Costs	(523·50)	(1,096·21)	(2,869·33)	(2,102·93)	
Net revenue	785·25	1,721·05	5,038·54	3,340·65	
Tax payable		(235·58)	(516·32)	(1,511·56)	(1,002·20)
CA tax benefits		150·00	112·50	84·38	253·13
After-tax cash flow	785·25	1,635·47	4,634·72	1,913·47	(749·07)
Working capital	(150·86)	(509·06)	246·43	544·36	
Project cash flow	634·39	1,126·41	4,881·15	2,457·83	(749·07)
Discount at 12%	0·893	0·797	0·712	0·636	0·567
Present values	566·51	897·75	3,475·38	1,563·18	(424·72)

	$000
PV of future cash flows	6,078·10
Initial investment	(2,000·00)
Working capital	(130·88)
NPV	3,947·22

The net present value is $3,947,220 and so the investment project is financially acceptable.

Workings

Year	1	2	3	4
Sales revenue ($000)	1,250	2,570	6,890	4,530
Inflated sales revenue ($000)	1,308·75	2,817·26	7,907·87	5,443·58

Year	1	2	3	4
Costs ($000)	500	1,000	2,500	1,750
Inflated costs ($000)	523·50	1,096·21	2,869·33	2,102·93

Year	1	2	3	4
Inflated sales revenue ($000)	1,308·75	2,817·26	7,907·87	5,443·58
Working capital ($000)	130·88	281·73	790·79	544·36
Incremental ($000)	(130·88)	(150·86)	(509·06)	246·43

Year	1	2	3	4
Capital allowance ($000)	500·00	375·00	281·25	843·75
Tax benefit ($000)	150·00	112·50	84·38	253·13

(b) Calculating the net present value of the investment project using a real terms approach requires discounting real terms cash flows with a real discount rate.

Real terms cash flows are found by deflating nominal cash flows by the general rate of inflation. Since only the general rate of inflation is available, the real terms operating cash flows are those given in the question.

The nominal discount rate is 12% and the general rate of inflation is 4·7%. The real discount rate is therefore 7% (1·12/1·047).

Year	1	2	3	4	5
	$000	$000	$000	$000	$000
Sales revenue	1,250	2,570	6,890	4,530	
Costs	(500)	(1,000)	(2,500)	(1,750)	
Net revenue	750·00	1,570·00	4,390·00	2,780·00	
Tax payable		(225·00)	(471·00)	(1,317·00)	(834·00)
CA tax benefits		150·00	112·50	84·38	253·13
After-tax cash flow	750·00	1,495·00	4,031·50	1,547·38	(580·87)
Working capital	(132·00)	(432·00)	236·00	453·00	
Project cash flow	618·00	1,063·00	4,267·5	2,000·38	(580·87)
Discount at 7%	0·935	0·873	0·816	0·763	0·713
Present values	577·83	928·00	3,482·28	1,526·29	(414·16)

	$000
PV of future cash flows	6,100·24
Initial investment	(2,000·00)
Working capital	(125·00)
NPV	3,975·24

The net present value is $3,975,240 and so the investment project is financially acceptable. The difference between the nominal terms NPV ($3,947,220) and the real terms NPV is due primarily to two factors. First, the tax benefits from capital allowances are not affected by inflation and so will have different present values due to the change in discount rate. Second, the working capital cash flows are timed differently to the sales income on which they depend, and so their inflation effects are timed differently to the related inflation effects in the discount rate.

Working

Year	1	2	3	4
Sales revenue ($000)	1,250	2,570	6,890	4,530
Working capital ($000)	125	257	689	453
Incremental ($000)	(125)	(132)	(432)	236

Examiner's note

An alternative approach is to deflate the nominal project cash flows from part (a) by 4.7% per year to give real terms project cash flows, before discounting by the real discount rate of 7%.

Year	1	2	3	4	5
	$000	$000	$000	$000	$000
Project cash flow	634.39	1,126.41	4,881.15	2,457.83	(749.07)
Deflate at 4.7%	605.91	1,027.55	4,252.87	2,045.34	(595.37)
Discount at 7%	0.935	0.873	0.816	0.763	0.713
Present values	566.53	897.05	3,470.34	1,560.59	(424.50)

	$000
PV of future cash flows	6,070.01
Initial investment	(2,000.00)
Working capital	(130.88)
NPV	3,939.13

(c) The directors of Darn Co can be encouraged to achieve the objective of maximising shareholder wealth through managerial reward schemes and through regulatory requirements.

Managerial reward schemes
As agents of the company's shareholders, the directors of Darn Co may not always act in ways which increase the wealth of shareholders, a phenomenon called the agency problem. They can be encouraged to increase or maximise shareholder wealth by managerial reward schemes such as performance-related pay and share option schemes. Through these methods, the goals of shareholders and directors may increase in congruence.

Performance-related pay links part of the remuneration of directors to some aspect of corporate performance, such as levels of profit or earnings per share. One problem here is that it is difficult to choose an aspect of corporate performance which is not influenced by the actions of the directors, leading to the possibility of managers influencing corporate affairs for their own benefit rather than the benefit of shareholders, for example, focusing on short-term performance while neglecting the longer term.

Share option schemes bring the goals of shareholders and directors closer together to the extent that directors become shareholders themselves. Share options allow directors to purchase shares at a specified price on a specified future date, encouraging them to make decisions which exert an upward pressure on share prices. Unfortunately, a general increase in share prices can lead to directors being rewarded for poor performance, while a general decrease in share prices can lead to managers not being rewarded for good performance. However, share option schemes can lead to a culture of performance improvement and so can bring continuing benefit to stakeholders.

Regulatory requirements
Regulatory requirements can be imposed through corporate governance codes of best practice and stock market listing regulations.

Corporate governance codes of best practice, such as the UK Corporate Governance Code, seek to reduce corporate risk and increase corporate accountability. Responsibility is placed on directors to identify, assess and manage risk within an organisation. An independent perspective is brought to directors' decisions by appointing non-executive directors to create a balanced board of directors, and by appointing non-executive directors to remuneration committees and audit committees.

Stock exchange listing regulations can place obligations on directors to manage companies in ways which support the achievement of objectives such as the maximisation of shareholder wealth. For example, listing regulations may require companies to publish regular financial reports, to provide detailed information on directorial rewards and to publish detailed reports on corporate governance and corporate social responsibility.

2 **(a)** Cost of equity of Card Co using DGM

The average dividend growth rate in recent years is 4%:
$(62\cdot0/55\cdot1)^{0\cdot333} - 1 = 1\cdot040 - 1 = 0\cdot04$ or 4% per year

Using the dividend growth model:
$K_e = 0\cdot04 + [(62 \times 1\cdot04)/716] = 0\cdot04 + 0\cdot09 = 0\cdot13$ or 13%

(b) The dividend growth model calculates the apparent cost of equity in the capital market, provided that the current market price of the share, the current dividend and the future dividend growth rate are known. While the current market price and the current dividend are readily available, it is very difficult to find an accurate value for the future dividend growth rate. A common approach to finding the future dividend growth rate is to calculate the average historic dividend growth rate and then to assume that the future dividend growth rate will be similar. There is no reason why this assumption should be true.

The capital asset pricing model tends to be preferred to the dividend growth model as a way of calculating the cost of equity as it has a sound theoretical basis, relating the cost of equity or required return of well-diversified shareholders to the systematic risk they face through owning the shares of a company. However, finding suitable values for the variables used by the capital asset pricing model (risk-free rate of return, equity beta and equity risk premium) can be difficult.

(c) Cost of debt of Card Co

The annual after-tax interest payment is $8\cdot5 \times (1 - 0\cdot3) = \$5\cdot95$ per bond

Using linear interpolation:

Year	Cash flow	$	5% DF	PV ($)	6% DF	PV ($)
0	Market price	(103·42)	1·000	(103·42)	1·000	(103·42)
1–5	Interest	5·95	4·329	25·76	4·212	25·06
5	Redemption	100	0·784	78·40	0·747	74·70
				0·74		(3·66)

After-tax cost of debt $= 5 + [((6 - 5) \times 0\cdot74)/(0\cdot74 + 3\cdot66)] = 5 + 0\cdot17 = 5\cdot17\%$

Market values

	$000
Equity: 8m x 7·16 =	57,280
Bonds: 5m x 103·42/100 =	5,171
Total value of Card Co	62,451

WACC calculation

WACC of Card Co $= [(12 \times 57,280) + (5\cdot17 \times 5,171)]/62,451 = 11\cdot4\%$

(d) First, the proxy company equity beta must be ungeared:

Asset beta $= (1\cdot038 \times 0\cdot75)/(0\cdot75 + (0\cdot25 \times 0\cdot7)) = 0\cdot842$

The asset beta must then be regeared to reflect the financial risk of Card Co:

Equity beta $= 0\cdot842 \times (57,280 + (5,171 \times 0\cdot7))/57,280 = 0\cdot895$

Project-specific cost of equity $= 4 + (0\cdot895 \times 5) = 8\cdot5\%$

(e) The value of a company can be expressed as the present value of its future cash flows, discounted at its weighted average cost of capital (WACC). The value of a company can therefore theoretically be maximised by minimising its WACC. If the WACC depends on the capital structure of a company, i.e. on the balance between debt and equity, then the minimum WACC will arise when the capital structure is optimal.

The idea of an optimal capital structure has been debated for many years. The traditional view of capital structure suggests that the WACC decreases as debt is introduced at low levels of gearing, before reaching a minimum and then increasing as the cost of equity responds to increasing financial risk.

Miller and Modigliani originally argued that the WACC is independent of a company's capital structure, depending only on its business risk rather than on its financial risk. This suggestion that it is not possible to minimise the WACC, and hence that it is not possible to maximise the value of a company by selecting a particular capital structure, depends on the assumption of a perfect capital market with no corporate taxation.

However, real world capital markets are not perfect and companies pay taxes on profit. Since interest is a tax-allowable deduction in calculating taxable profit, debt is a tax-efficient source of finance and replacing equity with debt will decrease the WACC of a company. In the real world, therefore, increasing gearing will decrease the WACC of a company and hence increase its value.

At high levels of gearing, the WACC of a company will increase due, for example, to increasing bankruptcy risk. Therefore, it can be argued that use of debt in a company's capital structure can reduce its WACC and increase its value, provided that gearing is kept to an acceptable level.

3 (a) (i) Cost of current ordering policy

Ordering cost = 12 x 267 = $3,204 per year

Monthly order = monthly demand = 300,000/12 = 25,000 units
Buffer inventory = 25,000 x 0·4 = 10,000 units
Average inventory excluding buffer inventory = 25,000/2 = 12,500 units
Average inventory including buffer inventory = 12,500 + 10,000 = 22,500 units
Holding cost = 22,500 x 0·1 = $2,250 per year

Total cost = 3,204 + 2,250 = $5,454 per year

(ii) Cost of ordering policy using economic order quantity (EOQ)

EOQ = $((2 \times 267 \times 300,000)/0·10)^{0·5}$ = 40,025 or 40,000 units per order

Number of orders per year = 300,000/40,000 = 7·5 orders per year
Order cost = 7·5 x 267 = $2,003

Average inventory excluding buffer inventory = 40,000/2 = 20,000 units
Average inventory including buffer inventory = 20,000 + 10,000 = 30,000 units
Holding cost = 30,000 x 0·1 = $3,000 per year

Total cost = $2,003 + $3,000 = $5,003 per year

(iii) Saving from introducing EOQ ordering policy = 5,454 – 5,003 = $451 per year

(b) Product Q trade payables at end of year = 456,000 x 1 x 60/365 = $74,959
Product Q trade payables after discount = 456,000 x 1 x 0·99 x 30/365 = $37,105
Decrease in Product Q trade payables = 74,959 – 37,105 = $37,854
Increase in financing cost = 37,854 x 0·05 = $1,893
Value of discount = 456,000 x 0·01 = $4,560
Net value of offer of discount = 4,560 – 1,893 = $2,667

(c) Invoice discounting refers to the purchase of selected invoices by a financial company at a discount to their face value. Invoice discounting can provide immediate cash to a company rather than waiting for the invoices to be settled. It tends to be used as an occasional source of short-term finance, rather than a regular source of cash. Invoice discounting can therefore aid in the management of trade receivables by accelerating cash inflow from trade receivables when short-term cash flow problems arise.

Factoring refers to a commercial arrangement whereby a financial company takes over the management of a company's trade receivables. This will include invoicing customers, accounting for sales and collections of amounts owed. Factors will advance cash to a company against the amounts outstanding. If the client requires, insurance against bad debts may also be provided (non-recourse factoring).

Factoring can assist in the management of trade receivables through the expertise offered by the factoring company. This may lead to a reduction in bad debts, a decrease in the level of trade receivables, a decrease in the amount of managerial time devoted to chasing slow payers, and taking advantage of early settlement discounts from trade suppliers due to the availability of cash from trade receivables.

(d) The objectives of working capital management are usually taken to be profitability and liquidity. Profitability is allied to the financial objective of maximising shareholder wealth, while liquidity is needed in order to settle liabilities as they fall due. A company must have sufficient cash to meet its liabilities, since otherwise it may fail. However, these two objectives are in conflict, since liquid resources have no return or low levels of return and hence decrease profitability. A conservative approach to working capital management will decrease the risk of running out of cash, favouring liquidity over profitability and decreasing risk. Conversely, an aggressive approach to working capital management will emphasise profitability over liquidity, increasing the risk of running out of cash while increasing profitability.

Working capital management is central to financial management for several reasons. First, cash is the life-blood of a company's business activities and without enough cash to meet short-term liabilities, a company would fail. Second, current assets can account for more than half of a company's assets, and so must be carefully managed. Poor management of current assets can lead to loss of profitability and decreased returns to shareholders. Third, for SMEs current liabilities are a major source of finance and must be carefully managed in order to ensure continuing availability of such finance.

4 **(a)** In order to evaluate whether Spot Co should use leasing or borrowing, the present value of the cost of leasing is compared with the present value of the cost of borrowing.

Leasing
The lease payments should be discounted using the cost of borrowing of Spot Co. Since taxation must be ignored, the before-tax cost of borrowing must be used. The 7% interest rate of the bank loan can be used here.

The five lease payments will begin at year 0 and the last lease payment will be at the start of year 5, i.e. at the end of year 4. The appropriate annuity factor to use will therefore be 4·387 (1·000 + 3·387).

Present value of cost of leasing = 155,000 x 4·387= $679,985

Borrowing
The purchase cost and the present value of maintenance payments will be offset by the present value of the future scrap value. The appropriate discount rate is again the before-tax cost of borrowing of 7%.

Year	Cash flow	$	7% Discount factor	Present value ($)
0	Purchase	(750,000)	1·000	(750,000)
1–5	Maintenance	(20,000)	4·100	(82,000)
5	Scrap value	75,000	0·713	53,475

Present value of cost of borrowing = 750,000 + 82,000 – 53,475 = $778,525

The cheaper source of financing is leasing, since the present value of the cost of leasing is $98,540 less than the present value of the cost of borrowing.

(b) Operating leasing can act as a source of short-term finance, while finance leasing can act as a source of long-term finance.

Operating leasing offers a solution to the obsolescence problem, whereby rapidly aging assets can decrease competitive advantage. Where keeping up-to-date with the latest technology is essential for business operations, operating leasing provides equipment on short-term contracts which can usually be cancelled without penalty to the lessee. Operating leasing can also provide access to skilled maintenance, which might otherwise need to be bought in by the lessee, although there will be a charge for this service.

Both operating leasing and finance leasing provide access to non-current assets in cases where borrowing may be difficult or even not possible for a company. For example, the company may lack assets to offer as security, or it may be seen as too risky to lend to. Since ownership of the leased asset remains with the lessor, it can be retrieved if lease rental payments are not forthcoming.

(c) Interest (riba) is the predetermined amount received by a provider of finance, over and above the principal amount of finance provided. Riba is absolutely forbidden in Islamic finance. Riba can be seen as unfair from the perspective of the borrower, the lender and the economy. For the borrower, riba can turn a profit into a loss when profitability is low. For the lender, riba can provide an inadequate return when unanticipated inflation arises. In the economy, riba can lead to allocational inefficiency, directing economic resources to sub-optimal investments.

Islamic financial instruments require that an active role be played by the provider of funds, so that the risks and rewards of ownership are shared. In a Mudaraba contract, for example, profits are shared between the partners in the proportions agreed in the contract, while losses are borne by the provider of finance. In a Musharaka contract, profits are shared between the partners in the proportions agreed in the contract, while losses are shared between the partners according to their capital contributions. With Sukuk, certificates are issued which are linked to an underlying tangible asset and which also transfer the risk and rewards of ownership. The underlying asset is managed on behalf of the Sukuk holders.

In a Murabaha contract, payment by the buyer is made on a deferred or instalment basis. Returns are made by the supplier as a mark-up is paid by the buyer in exchange for the right to pay after the delivery date. In an Ijara contract, which is equivalent to a lease agreement, returns are made through the payment of fixed or variable lease rental payments.

(d) There are several reasons which can be discussed in explaining why interest rates may differ between loans of different maturity, as follows:

Liquidity preference theory
This theory suggests that investors prefer to have cash now and so require compensation for lending money. The longer the period for which money is lent, the higher will be the interest rate to compensate the lender for deferring their use of the loaned cash. The higher interest rate for long-term debt over short-term debt will also compensate lenders for increasing risk over time, for example, the increasing risk of default with increasing maturity. Liquidity preference theory can therefore explain why the yield curve is normally upward sloping.

Expectations theory
This theory suggests that the relationship between short-term and long-term interest rates can be explained by expectations regarding interest rate movements. Where future interest rates are expected to rise compared to short-term interest rates, the yield curve will slope upwards. Where future interest rates are expected to fall compared to short-term interest rates, the yield curve will slope downwards.

Market segmentation theory
The reason why interest rates may differ between loans of different maturity could be because the balance between supply

and demand differs between markets for loans of different maturity. If demand for long-term loans is greater than the supply, for example, because of a high public sector borrowing requirement, interest rates in the long-term loan market will increase to restore equilibrium between demand and supply. Differing interest rates between markets for loans of different maturity can also explain why the yield curve may not be smooth, but kinked.

Fiscal policy

Governments may use fiscal policy to support the achievement of economic objectives. For example, the government or central bank may act to increase short-term interest rates in order to reduce inflation. This can result in short-term interest rates being higher than long-term interest rates, an effect which can be compounded if there is a decrease in the anticipated inflation reflected in long-term interest rates.

Fundamentals Level – Skills Module, Paper F9
Financial Management

December 2013 Marking Scheme

			Marks	*Marks*
1	**(a)**	Inflated sales revenue	1	
		Inflated costs	1	
		Tax liability	1	
		Capital allowance, years 1 to 3	1	
		Balancing allowance, year 4	1	
		Capital allowance tax benefits	1	
		Timing of tax liabilities and benefits	1	
		Incremental working capital investment	1	
		Recovery of working capital	1	
		Market research omitted as sunk cost	1	
		Calculation of nominal terms NPV	1	
		Comment on financial acceptability	1	
				12
	(b)	Calculation of real cost of capital	2	
		Real terms net revenue	1	
		Real terms after-tax cash flow	1	
		Real terms working capital investment and recovery	1	
		Calculation of real terms NPV	1	
		Comment on financial acceptability	1–2	
			Maximum	7
	(c)	Managerial reward schemes	3–5	
		Regulatory requirements	3–4	
		Other relevant discussion	1–2	
			Maximum	6
				25
2	**(a)**	Calculation of historic dividend growth rate	1	
		Calculation of cost of equity using DGM	2	
				3
	(b)	Dividend growth model discussion	2–3	
		Capital asset pricing model discussion	2–3	
			Maximum	5
	(c)	After-tax interest payment	1	
		Setting up linear interpolation calculation	1	
		Calculation of after-tax cost of debt	1	
		Calculation of market value of equity	0·5	
		Calculation of market value of debt	0·5	
		Calculation of WACC	1	
				5
	(d)	Ungearing proxy company equity beta	1	
		Regearing asset beta	1	
		Project-specific cost of equity using CAPM	2	
				4
	(e)	Traditional view of capital structure	1–2	
		Miller and Modigliani views of capital structure	3–4	
		Market imperfections view of capital structure	2–3	
		Other relevant discussion	1–2	
			Maximum	8
				25

				Marks	Marks
3	**(a)**	**(i)**	Current ordering cost	1	
			Buffer inventory	0·5	
			Average inventory	0·5	
			Holding cost	0·5	
			Total cost	0·5	
					3
		(ii)	Economic order quantity	1	
			EOQ order cost	1	
			Holding cost	0·5	
			Total cost	0·5	
					3
		(iii)	Saving from EOQ ordering policy		1
	(b)		Current trade payables	1	
			Trade payables after discount	1	
			Increase in finance costs	1	
			Value of discount	1	
			Net value of discount offer	1	
					5
	(c)		Invoice discounting	2–3	
			Factoring	3–4	
				Maximum	6
	(d)		Objectives of working capital management	3–4	
			Role of working capital management	3–4	
				Maximum	7
					25
4	**(a)**		Timing of lease payments	1	
			Present value of cost of leasing	1	
			Present value of maintenance costs	1	
			Present value of salvage value	1	
			Present value of cost of borrowing	2	
			Evaluation of financing choice	1	
			Explanation of evaluation of financing method	3	
					10
	(b)		Attractions of leasing as short-term finance source	2–3	
			Attractions of leasing as long-term finance source	2–3	
				Maximum	5
	(c)		Explanation of interest (riba)	1–2	
			Explanation of returns on Islamic financial instruments	3–4	
				Maximum	5
	(d)		Liquidity preference theory	1–2	
			Expectations theory	1–2	
			Market segmentation theory	1–2	
			Fiscal policy	1–2	
				Maximum	5
					25