Manufacturing Engineering Tripos Part 1
P3 Exam Crib 2009

SECTION A

1 (a) [20%]

$$P = MC_1 = MC_2$$
$$MC_1 = 10 + 0.8 \, q_1$$
$$MC_2 = 8 + 0.03 \, q_2$$

$$Q = 100 \, q_1 + 30 \, q_2$$
$$P = 280 - 0.0025 \, Q$$
$$P = 280 - 0.0025 \{100.[(P-10) / 0.08] + 30.[(P-8)/0.03]\}$$
$$P = 331.25 / 6625 = 50$$

$$q_1 = 500$$
$$q_2 = 1400$$
$$Q = 1900$$

$$Prof_1 = 100 \times 500 \times 50 - 100 \times (10000 + 5000 + 10000)$$
$$= 0$$
$$Prof_2 = 30 \times 1400 \times 50 - 30 \times (21600 + 11200 + 29400)$$
$$= 234,000$$

(b) [20%]

Find minimum of each ATC,

$$ATC_1 = 10000/ q_1 + 10 + 0.04q_1$$
$$ATC_2 = 21600/ q_2 + 8 + 0.015q_2$$

$$dATC_1 / dq_1 = -10000/ q_1^2 + 0.04$$
$$dATC_2 / dq_2 = -21600/ q_2^2 + 0.015$$

$$q_1^2 = 250000$$
$$q_2^2 = 1440000$$

$$q_1 = 500$$
$$q_2 = 1200$$

$$ATC_1^{min} = 50$$
$$ATC_2^{min} = 44$$

Only Technology 2 firms exist and $P = 44$

$$44 = 280 - 0.0025 \, Q$$
$$Q = 94400$$

$$N_2 = 94400 / 1200 = 79 \text{ approx.}$$

(c) [15%]

$$Prof_m = (136 - 0.00132q_m) \, q_m - 2340000 - 4q_m$$

$$\text{dProf}_m/\text{dq}_m = 136 - 0.00264q_m - 4 = 0$$

$$q_m = 50000$$
$$P = 70$$

$$\text{Prof}_m = 70 \times 50000 - 2340000 - 4 \times 50000 = 960000$$

(d) [20%]
Assume that threat of entry forces monopolist to reduce to the limit price of 50 (i.e. 44 plus transport cost of 6 per unit), then no entry occurs. This results in the following in Country B:

$$P = 50$$
$$50 = 136 - 0.00132q_m$$
$$q_m = 86 / 0.00132 = 65152$$

(e) [25%]
Discuss the short-run perfectly competitive outcome in part (a) and the presumption of no collusion between the firms.

Discuss the long-run equilibrium assumption in part (b) that there are no competitors other than these two sets of firms. Possibly criticise the assumption of stable technology. Discuss whether the existence of fewer than 80 firms is consistent with the assumption of perfect competition.

In part (d) discuss the strategic behaviour of the monopolist in terms of limit price theory. But also discuss the double-edged nature of the removal of tariff barriesr since the monopolist could attack Country A's market using its lower cost position. Without intervention by the regulators it could drive Country A's firms out of business and establish a monopoly position across both countries. It could then engage in a degree of price discrimination (with a limit of 6 on the price differential between the two countries

Well answered in general. Most marks were dropped in Parts (d) and (e) where the analysis required more depth.

2 (a) [25%]
This requires a discussion of the model of advertising intensity that links its level to the effectiveness of your advertising, the response of competitors to your advertising and the effectiveness of their advertising. The first of these terms can be shown to be related to the profitability of the product (this in turn is related to market concentration, strategic positioning, barriers to entry etc.) and to the nature of the product (e.g. consumer products that are, low price, frequently purchased, harder to evaluate, strongly branded etc. are more influenced by advertising. The second of these terms can be shown to depend on the state of competition in the industry. A good answer would discuss this and explain why the response is likely to be greatest in middle concentration industries.

(b) [25%]
The best way to answer this is probably to first explain what are economies of scale and introduce the concept of minimum efficient size. This would lead to identifying the scale of m.e.s relative to the market and the cost penalty of being below m.e.s as

the key variables to measure. The discussion could then discuss engineering estimates, statistical cost analysis and the survivor technique as means of attempting to measure these, but other approaches could be offered.

(c) [50%]
One part of the answer will explain why significant economies of scale will tend to lead to market concentration and can follow this with an analysis of the implications of this for competition and collusion. Another part of the answer could focus on the implications of significant economies of scale as a barrier to entry. This in turn can lead on to a discussion of limit pricing theory. There is plenty of scope to develop the answer in several directions and a very good answer will draw upon examples to illustrate the points being made.

Only four candidates tackled this question. The answers did not develop a model for advertising but provided reasonable attempts at the question.

3 (a) [5%]
  (i) and (iii) represent unrealised gains.

(b) [5%]
75 % of equity (250,000 share capital and 150,000 retentions) is £300,000. Grace plc paid £360,000 so the Goodwill is £60,000.

(c) [10%]
Deferred tax carried forward is 80,000 x 0.24 = £19,200. The deferred tax brought forward is £24,800, so there will be a credit of £5,600 (24,800 – 19,200) to the P&L. Total charge for taxation is £48,360 (53,960 – 5,600).

(d) [40%]
The accounting treatment in each of the areas identified by the Directors is governed by specific accounting standards. In each case, the relevant standard provides guidance as to how much choice the Directors may exercise. Research and development expenditure is covered by SSAP 13. The standard differentiates between research expenditure and development expenditure by defining development expenditure as being the use of existing knowledge in order to produce new or improved materials devices or processes. On the other hand, research expenditure could be defined as expenditure on activities which are designed to obtain new knowledge.

The standard further divides research expenditure into two further categories. Pure research is intended to gain new knowledge for its own sake, while applied research is intended to gain new knowledge – but in this case there is a specific outcome intended. The standard states that all research expenditure must be written off as incurred. However it allows a degree of choice with regard to development expenditure. Although the preferred accounting treatment is that development expenditure should also be written off as incurred, the standard allows development expenditure to be carried forward to be written off in future periods 'to the extent that its recovery can reasonably be regarded as assured'.

The standard sets out six criteria which must be met if development expenditure is to be carried forward. If these criteria are met, the directors can choose whether or not to carry the expenditure forward. However it should be noted that the decision to carry forward or write off development expenditure must be applied consistently to all development expenditure.

Depreciation is defined in FRS 15 as the measure of the economic benefits of the value of a fixed asset that have been consumed during the accounting period. From this it follows that for all assets for which economic benefits are consumed, depreciation must be charged. This will include almost all fixed assets as perhaps only freehold land is a type of fixed asset which is not consumed, and therefore need not be depreciated. The directors have to choose the method by which the amount of depreciation to be charged in an accounting period is calculated, but this is somewhat constrained by the requirement that the method should reflect the pattern of the consumption of economic benefits over the useful life of the asset. Once a method is chosen, it should be applied consistently.

Revaluation of fixed assets is also considered in FRS 15 which states that the directors may choose whether or not to revalue fixed assets. This choice is, once again, constrained by certain requirements set out in the standard: all assets in the same class must be treated consistently (i.e. either revalued or carried at cost); if a policy of revaluation is adopted, revaluations must be kept up to date; depreciation should be calculated on the revalued amount.

The effect on profit will depend on the period over which profit is considered. For example a choice which reduces profit in the current year, will increase profit in future periods. In the case of research and development expenditure, deferral increases current profit, but as amounts deferred must be charged to profit over the life of the product, future profits will be reduced. With regard to depreciation, the full cost will be charged to profit over the useful economic life of the asset, but short term profits will be affected by the method of depreciation. If the reducing balance method is selected, depreciation charges will reduce year on year. A more appropriate way of maximising profits is to spread the cost over as long a period as possible i.e. select the maximum useful economic life possible. Revaluation will not affect profit in the year of revaluation as any gain is taken to a Revaluation Reserve, and not to Profit and Loss. However, if an asset is revalued, future profits will be reduced, as depreciation will be calculated on the revalued amount, not cost.

(e) [40%]
Sale of machine
The loss on the sale of the machine is around 3% of earnings. Consequently, it is difficult to argue that the loss is material. This means that separate disclosure is not necessary. In addition, the disposal of fixed assets is a normal, and often repeated, activity. This leads to the conclusion that the expense is a normal ongoing expense, and its inclusion in cost of sales is appropriate. Therefore no action is needed.

Reorganisation costs
The reorganisation costs are almost certainly material, as they represent almost 17% of earnings. While not an item that will occur on an annual basis, reorganisation is not uncommon, and would therefore be considered to be a part of the ordinary activities of the organisation. This observation is strengthened by the fact that there has been no

change in the underlying business carried on. The conclusion is therefore that while the expense is not particularly unusual, its materiality means that it is likely to be of assistance to the reader of the financial statements if information about the expense was provided. Therefore, no adjustment to profit is required, and the expense is correctly included in the cost of sales. Separate disclosure should be made in a note to the financial statements.

Warranty provision
As it is the organisation's practice to provide for warranty obligations, this item is a recurring charge. However, the key question is whether the correction should be considered to be a prior period error. As a prior period error will lead to a restatement of the opening reserves, it will not affect the calculation of earnings for the current year. Prior period errors are defined as omissions or misstatements which have occurred due to incorrect use of reliable information which either was available or could have been obtained when the previous financial statements were prepared. Therefore, as the misstatement arose due to mathematical error, the correct treatment is to restate the opening reserves. Therefore the current year profit and earnings will not be affected by the correction of the misstatement. Once again, details of the expense should be provided in a note to the financial statements.

Based on the comments above, the correct reported EPS will be 31.2p.
This has been calculated as follows:

	£
Earnings per draft financial statements	205,500
Adjustments to earnings:	
Warranty provision	28,500
Corrected earnings	234,000

Number of shares:

Earnings per draft financial statements	205,500		
EPS per draft financial statements	27.4p		
thus, number of shares	(205,500 ÷ 0.274)	=	750,000
EPS	(234,000 ÷ 750,000)	=	31.2p

The short questions were generally tackled well. The standard dropped in the final part that concerned the accounting treatment of various costs. There was some confusion about whether adjustments were needed and what their effect would be on bottom line.

4 (a) [5%]
Should report a provision of £35,000.

(b) [5%]
Should charge the P&L £45,000 and there is no effect on the Revaluation Reserve.

(c) [5%]
The balance sheet will show a Fixed Asset of £85,000, a Current Liability of £16,000 and a Long Term Liability of £64,000.

(d) [5%]
There will be no change to retained profit and net assets. Correction of last year's error would reduce retained profits and stocks last year, but because this year's value for closing stock is correct, the correction would increase this year's profit by the same amount as the decrease in retained profits brought forward.

(e) (i) [15%]
The essential difference between a subsidiary and an associate is:
– a subsidiary is a company over which the investor can exercise control
– an associate is a company over which the investor can exercise a significant influence.
In more detail, control is usually exercised by the investor through controlling the operating and financial policies of the investee, and controlling the board of directors. On the other hand, if the investor is able to influence, but not control, the operating and financial policies of the investee and has representation on the board of directors, but cannot control it, the investee is an associate. One aspect of the relationship that is similar in both cases is that the interest held by the investor must be a participating interest. This means that the investment is held for the long term for the purpose of securing a contribution to the activities of the investor.

(ii) [35%]

Net assets at date of acquisition	=	£1,800,000
80% acquired	=	£1,440,000
Consideration paid	=	£1,700,000

Thus Goodwill = 1,700,000 – 1,440,000 = **£260,000**

Goodwill amortised over five years, thus annual charge is:
£260,000 ÷ 5 = **£52,000**

Two years since acquisition, thus amortisation to 30 November 2008
£52,000 x 2 = £104,000
Thus unamortised = £260,000 – £104,000 = **£156,000**

Cowdrey retained profits at 1 December 2007	=	£1,257,000
at acquisition	=	£1,187,000
Thus post acquisition profits	=	£70,000
Group share (80%)	=	£56,000
Graveney retained profits at 1 December 2007	=	£3,168,000
Goodwill amortised to 30 November 2007	=	£(52,000)
Group retained profits at 1 December 2007	=	£3,172,000

(iii) [30%]

Graveney Group Ltd
Consolidated Profit and Loss Account for the year ended 30 November

		£,000
Turnover	(5,126 + 1,543)	6,669
Cost of sales	(3,728 + 1,071)	4,799
Gross profit		1,870
Expenses	(678 + 231 + 52)	961
Operating profit		909
Taxation	(143 + 41)	184
Profit after taxation		725
Minority interest (200 x 20%)		40
Group retained profit for year		685
Group retained profit brought forward		3,172
Group retained profit carried forward		3,857

This question was tackled well with the exception of Part (d).

5

(a) [5%]
13.50 x 570 – 8238 = - £543 (i.e. £543 adverse)

(b) [5%]
(2,854,800 + 120,000) – 0.14 x (11,600,000 + 340,000) = £ 1,303,200

(c) [10%]
Design

Variable costs £29 x 2,400 hours	=	£ 69,600
Fixed costs		£ 56,160
		£125,760
Profit = 40% mark up	=	**£50,304**

Production

Cost to production section		£176,064
Production Variable costs £35 x 7,000		£245,000
Fixed costs		£172,000
Total costs		£593,064
Revenue £90 x 7,000 hours	=	£630,000
Profit	=	**£36,936**

(d) (i) [55%]

	X	S	M
	£	£	£
Selling price	360.00	450.00	550.00
Variable costs:			
Materials	111.40	114.50	116.30
Labour: machining	82.50	123.75	151.25
Labour: assembly	13.10	14.70	15.40
Variable overheads	33.60	50.40	61.60
Machine costs (W1)	22.86	34.29	45.72
Total variable cost	263.46	337.64	390.27
Contribution per unit	96.54	112.36	159.73
Labour hours per unit (W2)	3	4.5	5.5
Contribution per labour hour	32.18	24.97	29.04
Rank	1	3	2
Demand (units)	450	340	280
Hours required	1,350	1,530	1,540 = 4,420

Only 2,989 hours available. thus 1,431 hours short.
Production of third ranked product in 1,431 = 318 units of Supon
Thus production schedule:

Xon	450 units	= 1,350 hours
Megon	280 units	= 1,540 hours
Supon	340 – 318 units = 22 units	= 99 hours
	Total	2,989 hours

Working 1
Machine Cost £457,200
Useful life 10,000 hours thus cost per hour = £45.72
Machine cost at £45.72 per hour:

	Xon	Supon	Megon
	£22.86	£34.29	£45.72

Working 2

	Xon	Supon	Megon
Labour cost per unit	£82.50	£123.75	£151.25
at £27.50 per hour =	3 hours	4.5 hours	5.5 hours

(d) (ii) [25%]

Before a final decision is taken, the company should seek clarification of a number of issues, including the following.

Continuity of delivery

Can we be sure that the supplier will continue to supply us in the long term? If we decide to purchase the component, our own production expertise will decline. If supply was halted for any reason, it would be difficult to recommence production quickly.

Future Prices

Is there any guarantee that the current price will be maintained in the future, or is there a risk that the supplier will increase the price once our own production facility has been shut down?

Reliability of delivery

We would need to consider whether the supplier can be relied on to deliver the quantities we require within our required timescales. In particular, can deliveries be obtained at short notice? If not we will be forced to give up opportunities in the future through not being able to meet customer demand.

Quality

While we are producing the component ourselves, we have both control over, and some assurance of, quality. Of course it is possible that a specialist manufacturer may be able to offer enhanced quality.

Potential to expand market

The availability of a new source of supply for the component may provide an opportunity to expand production capacity and an incentive for a policy of market development. There is a possibility that the constraint imposed by our existing machinery has meant that we have not sought out such opportunities.

Staff morale

The effect of any redundancies on the morale of the remaining staff would need to be carefully considered. Staff may interpret the decline in production as evidence of a lack of commitment by the management.

Strategy

It is possible that it is company policy that as far as possible, we should manufacture all components in-house. This has the effect of portraying the company as self sufficient.

Retention of commercial information

We would need to be sure that by allowing another company to have access to information such as our production process and level of activity, that we are not divulging commercial information which, for strategic or competitive reasons, should be retained internally.

Good overall. The main weakness was in the treatment of sunk costs and in not calculating the labour hour rate.

6

(a) [5%]

Selling price per unit	£28.75
Variable cost per unit (£19.50 – £4.20)	£15.30
Contribution per unit	£13.45
Expected Sales volume	= (230,000 x 30%) + (368,000 x 70%) = 326,600
Thus expected contribution	= 326,600 x £13.45 = **£4,392,770**

(b) [5%]

Reported profit	= £478,000
Reported value of assets £2,756,000	
x Cost of capital 11%	= £303,160
Thus residual income	= **£174,840**

Operating profit after tax = £447,000
Economic value of assets £3,150,000
x Cost of capital 11% = £346,500
Thus EVA = **£100,500**

(c) [5%]

£4.7m - a sunk cost is a cost which has been incurred and cannot be recovered.

(d) [5%]

By using a higher grade of staff, the staff cost per hour is increased above standard leading to an adverse variance.
Lower grade materials would cost less than standard, leading to a favourable variance.

(e) (i) [35%]

Cost per unit:

	STA £	RPA £	MNA £
Direct material	95.00	108.00	125.00
Direct labour	85.00	98.00	106.00
Machine running (W3)	14.00	28.00	49.00
Production set up (W4)	2.97	2.76	2.56
Order processing (W5)	3.26	2.74	1.80
	200.23	239.50	284.36

Working 1   Cost per unit of cost driver

Cost pool	Cost driver	Total Cost	Driver total	Cost per unit
Machine running	Machine hrs	£4,655,000	133,000 (W2)	£35.00
Production set up	Prodn. runs	£460,000	100	£4,600.00
Order processing	Orders	£443,300	806	£550.00

Working 2   Total machine hours

	Production volume (,000)	Machine hrs/unit	Total machine hrs
STA	65	0.4	26
RPA	55	0.8	44
MNA	45	1.4	63
			133

Working 3   Machine running cost per unit produced

STA	£35.00 per hour	x 0.4 hours per unit	=	£14.00
RPA		x 0.8 hours per unit	=	£28.00
MNA		x 1.4 hours per unit	=	£49.00

Working 4   Production set up cost per unit produced

STA	£4,600 per set up	x 42 set ups ÷ 65,000 units	=	£2.97
RPA		x 33 set ups ÷ 55,000 units	=	£2.76
MNA		x 25 set ups ÷ 45,000 units	=	£2.56

Working 5   Order processing cost per unit produced

STA	£550 per order	x 385 orders ÷ 65,000 units	=	£3.26
RPA		x 274 orders ÷ 55,000 units	=	£2.74
MNA		x 147 orders ÷ 45,000 units	=	£1.80

(e) (ii) [45%]

	STA £	RPA £	MNA £
Selling price per unit	320.00	360.00	450.00
Variable cost per unit	180.00	206.00	231.00
Contribution per unit	140.00	154.00	219.00

If no action is taken:

Product	Sales volume ,000 units	Contribution per unit £	Total £000	prob.	£000
STA	48	140.00	6,720.00		
RPA	40	154.00	6,160.00		
MNA	36	219.00	7,884.00		
			20,764.00	0.15	3,114.60
STA	51	140.00	7,140.00		
RPA	42	154.00	6,468.00		
MNA	38	219.00	8,322.00		
			21,930.00	0.45	9,868.50
STA	56	140.00	7,840.00		
RPA	46	154.00	7,084.00		
MNA	42	219.00	9,198.00		
			24,122.00	0.40	9,648.80
					22,631.90

If action is taken:

Product	Sales volume ,000 units	Contribution per unit £	Total £000	prob.	£000
STA	57	135.00	7,695.00		
RPA	47.5	149.00	7,077.50		
MNA	42.75	214.00	9,148.50		
			23,921.00		
less: cost of initiative			120.00		
net contribution			23,801.00		

As the contribution is greater than the expected contribution if no action is taken, the substitute material should be used and the initiative undertaken.

There were some excellent answers, but several candidates failed to manage the expected value of the contribution calculation.

7 (a) [5%]
The weighted average cost of capital is:

	Capital Market value £m	Weight %	Cost %	Weighted cost
Ordinary shares	48.0	0.60	11.0	6.6
Loan capital	32.0	0.40	6.0	2.4
				9.0

(b) [5%]
By exercising the option the holder will make a gain of 1,000 x (680p – 650p) = £300. However, a premium of £400 (1,000 x 40p) has been paid, resulting in a net loss of £100.

(c) [5%]
%
Pay loan interest	(7.8)
Receive fixed interest	7.5
Pay floating rate	(7.1)
Effective rate	7.4

(d) [5%]
WACC = 10%{1 – [(40 x 0.20)/(40 + 60)]} = 9.2%

(e) (i) [40%]
Incremental cash flows

Year	0	1	2	3	4
	£000	£000	£000	£000	£000
Sales		720	720	720	540
Sale of machinery	(420)				86
Working capital	(120)				120
Variable costs		(270)	(270)	(270)	(270)
Fixed costs		(215)	(215)	(215)	(215)
	(540)	235	235	235	261

(e) (ii) [20%]
Net present value

Year	0	1	2	3	4
	£000	£000	£000	£000	£000
Incremental cash flows	(540)	235	235	235	261
Discount rate 10%	1.00	0.91	0.83	0.75	0.68
Present value	(540)	213.9	195.1	176.3	177.5

NPV = 222.8

Discounted payback

Year	0	1	2	3	4
	£000	£000	£000	£000	£000
Present value	(540)	213.9	195.1	176.3	177.5
Cumulative cash flows	(540)	(326.1)	(131.0)	45.3	222.8

Discounted payback = between 2 and 3 years

(e) (iii) [20%]
The NPV method of investment appraisal takes into consideration all relevant cash flows relating to a project and discounts these cash flows to take account of both risk and the time value of money. It is conceptually sound and entirely consistent with the stated mission of the business, which is to maximise the wealth of its shareholders. The discounted payback period also discounts cash flows but ignores cash flows beyond the payback period. It is a 'break-even' approach to appraising investment that is not consistent with the maximisation of shareholder wealth.

Using more than one method for appraising an investment opportunity runs the risk of producing conflicting signals. In this case, the NPV is positive and so the decision rule is that the investment project should be accepted. The discounted payback, however, is longer than the period required by the business and so the decision rule is that the investment project should be rejected.

Given that the NPV method is consistent with the stated objective of the business and that the discounted payback method is not, the NPV method should be regarded as the primary method of appraisal. Thus, the NPV decision rule should prevail and the investment should be accepted.

A very popular question, generally answered well. The most common problems were over the timing of initial costs and the treatment of sunk costs.

8

(a) [5%]
Investors will receive, in present value terms:
$$£8 \times 0.91 + £8 \times 0.83 + £110 \times 0.83.$$
The value of the bonds is, therefore, £105.22.

(b) [5%]

Original share (4 x £6.00)	24.00
Rights share (£6·00 x 0.60)	3.60
	27.60

Ex-rights price (£27.60/5)	5.52
Cost of acquiring rights share	3.60
	1.92

Value of rights per original share = (£1.92/4) = 0.48

(c) [5%]
Option i is correct as it offers the business the opportunity to sell euros that will be received in the future at a predetermined rate. Option ii is inappropriate as it involves buying euros in the future. It would be appropriate if payment in euros were required. Option iii does not hedge against currency movements. Option iv would be appropriate if payment in euros were required.

(d) [5%]
Using CAPM, the expected return for the equity shareholders is:
$$6\% + [1.5 \, (10\% - 6\%)] = 12.0\%$$
Using the dividend (no growth) valuation model, the predicted market value of a share is:
$$P_0 = D_1/K_0 = 40p / 0.12$$
$$= 333.3 \text{ pence}$$

(e) (i) [10%]

The company is changing its strategic direction by investing in a new type of business, the provision of software solutions to retailers. This new business cannot be assumed to have the same level of risk as that associated with the existing business. As a result, it is appropriate to review the weighted average cost of capital as this will be affected by changes in the level of risk.

(e) (ii) [40%]

The ungeared beta of Amos plc is calculated as follows:

$$\beta a = \beta e \, [E/E + D \, (1 - t)]$$

Where:

βa = asset beta

βe = equity beta

E = equity proportion within capital structure

D = debt proportion within capital structure

t = corporation tax rate

Therefore βa = $1.8 \, [60/\{60 + 40 \, (1 - 0.20)\}]$ = 1.17

The capital structure of Flint plc, based on market values, is as follows:

£m

Equity		
Ordinary shares	500m x £4.80	2,400
Loan capital		
Debentures	£1,000m x 120/100	1,200
Bank loan		1,300
		1,500

Using CAPM, the ungeared cost of equity will be:

$$Ke = r_f + [E(rm) - r_f] \, \beta j$$

Where:

Ke = expected return to equity

r_f = risk-free rate of return

E(rm) = the expected return from the market as a whole

βj = the ungeared beta of Amos plc

Therefore $Ke = 3.5 + (6.8 - 3.5) \times 1.17 = 7.36\%$

Using MM (with taxes), the WACC will be:

$$WACCg = Keu \times \{1 - (Dt/(E + D))\}$$

Where:

WACCg = Weighted average cost of capital to be used as the discount factor

Keu = Cost of equity and weighted average cost of capital of a similar ungeared company

WACCg $= 7.36 \times \{1 - ((1,500 \times 0.20)/(2,400 + 1,500))\} = 6.79\%$

(e) (iii) [30%]
A number of problems can be identified with the approach used in (b) above, including:

- problems in identifying another business that has similar operating characteristics;
- differences in beta values between businesses that may be caused by differences in size, differences in cost structures etc;
- differences in the growth characteristics between businesses;
- the unrealistic assumption that debt is risk free, leading to an overstatement of financial risk in a geared company and a compensating understatement in business risk.

Only one candidate answered this, but gave an excellent answer.