MANUFACTURING ENGINEERING TRIPOS

PART 1 EXAMINATIONS 2005-06

PAPER P3 EXAM CRIB

It should be recognised that for questions of the type found in this examination there is no unique first class answer. In addition, the clarity of the structure and the logical construction of an argument are as important as demonstrating knowledge of the material.

1.

(a) $AC = 1000/q + 8 + 0.001q$

$\partial AC / \partial q = 0 = -1000/q^2 + 0.001$

$\therefore q = 1000$ for AC minimum

$AC_{min} = 10$

Price must equal average cost = 10

Total output given by $Q = 8000 - 500 * 10$

$\therefore Q = 3000$

$\therefore$ Number of firms = 3000 / 1000 = 3

(b)

The shape of firms cost curves is important for several reasons. Firstly, in terms of economic theory, short run theory assumes fixed element hence diminishing marginal productivity whilst long run theory assumes increasing returns to scale (economies of scale) and decreasing returns to scale (diseconomies of scale). Perfect competition depends on U-shaped cost curves and l-shaped cost curves would mean that firm size is indeterminate. Secondly, firms want to know whether they can cut their average costs by increasing in size, normally by acquisition. Thirdly, governments need to know which industries are concentrated because of economies of scale. If not, then the government could increase competition by splitting up firms.

(c) There are several reasons why average cost may decline at initial levels of output. These include various plant level economies of scale, in terms of production (Labour; specialization, learning by doing: Capital; indivisabilities, initial fixed costs, reserve capacity, engineering rule: Inventory economies; lower inventories required in spare parts, raw materials and ready products), selling or marketing (advertising and promotion), managerial (Time saving managerial techniques, i.e. specialist software), storage and transport (storage costs lower according to engineering rule), and pecuniary economies (lower prices for bulk-buying of raw materials, lower cost of finance for large firms). They also include non-plant level economies such as multi-plant economies, vertical integration, diversification, and economies of scope. At high levels of output however, the average cost may start to increase for several reasons: labour becomes too monotonous, large plants have more labor disputes than smaller ones,

engineering rule does not go on indefinitely and structural reinforcements become necessary, managerial diseconomies because too many divisions to operate.

(d) In assessing what empirical research tells us about the shape of cost curves in practice, the student should review a wide range of empirical research examining both plant and multi-plant economies of scale. This should include the following; general relationship between size and profitability, survivor technique analysis, engineering method analysis, statistical cost analysis. The candidate should recognise the strengths and weaknesses of these approaches and their key findings. In particular, although the methods of estimation are crude, there is substantial evidence that both plant and multi-plant economies are very important in practice. However, the economies are probably not enough to warrant small numbers of firms in most industries. Finally, evidence on diseconomies of scale is somewhat inconclusive.

2. (a) The board of directors of a listed public company will usually consist of executive directors, who hold specific responsibilities within the business (for example personnel director), and non-executive directors, who do not have specific responsibilities. Non-executive directors are usually employed on a part-time basis and are not involved in day-to-day operational matters. Nevertheless, executive and non-executive directors have the same legal obligations towards the shareholders of the company. Non-executive directors have a valuable role to play in the development of strategy and in monitoring the actions of the executive directors. The latter role has received greater emphasis as a result of the Cadbury Report. In carrying out this role, non-executive directors are expected to challenge the decisions of the executive directors and to highlight bad practice or poor performance. Non-executive directors should add value to the company in some way and their ability to do so may depend, to a large extent, on the personal qualities that they possess. They should normally bring to the company broad experience of the commercial world as well as considerable expertise in their particular field. These qualities may help to add value through identifying new opportunities, developing new performance measures or improving existing control systems. In addition, non-executive directors may be a valuable source of new contacts for the company. Non-executive directors can often provide objective and independent advice to the Board of Directors. This should be of particular value during periods of change or crisis, when a detached view can help the executive directors maintain perspective.

(b) There are a number of potential problems connected with the role of the non-executive director. It has been suggested that there is a conflict between the strategic role that non-executives are required to play and their monitoring role – even though both are important in representing shareholders' interests. The development of strategic plans involves teamwork and cooperation between the executive and non-executive directors whereas the monitoring role requires that non-executive directors remain independent from the executive directors. Although non-executive directors should be able to fulfil the two roles, it may require a delicate balance to be struck. There is a risk that the relationship between the executive and non-executive directors will compromise the monitoring role that non-executive directors must carry out. Executive directors normally have an influence over the selection of non-executive directors. In addition, crossholdings of non-executive directorships and social links between non-executive and executive directors may create close bonds between the executive and non-executive directors. Thus, non-executive directors may not always provide the independent voice that shareholders wish. The attitude and behaviour of executive directors towards the non-executive directors can be crucial in ensuring that nonexecutive directors are able to carry out their roles effectively. There is a risk that the executive directors will seek to

undermine the monitoring role of non-executive directors by failing to provide relevant information. In addition, the attitude and behaviour of non-executives towards their role can be a problem. Some non-executive directors have been accused of accepting too many non-executive director appointments. As a result, they have insufficient time to devote to the increasingly complex problems of directing and controlling a company. The potential problems identified may be dealt with in various ways. To help ensure the independence of non-executive directors, shareholders may be given a bigger role in the recruitment and selection process. Regular meetings between nonexecutive directors and shareholders may help to strengthen links between the non-executive directors and the shareholders and help to create greater independence from the executive directors. Where non-executive directors challenge the executive directors on particular matters, there should be safeguards to ensure that they will not be penalised for so doing. Non-executive directors must have access to all relevant information. This means representation on key committees of the board such as the audit committee, which is designed to improve the quality and integrity of financial reporting and controls, and the remuneration committee, which recommends compensation for executive directors. In addition non-executive directors must have the expertise to ensure that relevant information is identified and fully understood and the strength of character to ensure that executive directors are properly challenged. Given the increasing complexity of modern businesses, it may be necessary for non-executives to participate in training courses in order to fulfill their role effectively. The increasing burdens placed on non-executive directors means that a significant amount of time must be spent in dealing with company affairs. Non-executives should be properly rewarded for the time spent in order to encourage a diligent attitude. In addition, some restriction on the number of non-executive appointments that an individual can hold may be desirable.

(c) There are other internal and external forms of monitoring that might be used to supplement, or replace, the role played by non-executive directors. From an internal perspective, there are other aspects of board structure which could improve monitoring. For example, as well as calling for an increased role for non-executives, the Cadbury and Greenbury Reports, called for smaller size of boards, the creation of remuneration, audit, and nomination committees consisting of non-executives, the indepedenence of non-executives, the separation of the CEO and Chairman role. These reports called for an improvement to the market for executive directors. An efficient market for executive directors would provide a constraint on their behaviour. However, the market is imperfect, and CEOs spend most of their careers within the same firm and CEO turnover is low. Cadbury sought to encourage an active market in managerial talent, by recommending that directors' service contracts be no longer than three years with renewal subject to shareholder approval. A potentially important external monitor is institutional shareholders. They own large stakes which have increased over time and the Cadbury and subsequent reports argued that institutional investors should play an active role consulting more with management, and displaying an increased tendency to vote and to intervene. For example (Cadbury) in the nomination and selection of non-executives. However, the likelihood is low given the costs of identifying suitable non-executives and developing mechanisms of consultation with companies. Institutional investors have become much more active in the US, with much success. The Association of British Insurers (ABI) and the National Association of Pension Funds (NAPF) have issued guidelines (2001) on how institutional shareholders should act. They have encouraged responsible voting including positive support for boards of directors unless good reason for not doing so. They have advocated paying attention to the composition of the board, the role played by non-executive directors, and incentive schemes. An alternative external monitor on boards is the market for corporate control, whereby companies that are underperforming are acquired in

hostile takeovers. Facilitating such a market could result in greater monitoring of executives. However, there are theoretical problems with this mechanism. The disciplinary motive depends on the following crucial conditions. Share prices must be "efficient", there must be sufficient knowledge about the operations of firms, and there must be a sufficient supply of corporate raiders. However, these conditions may not hold in practice. There is little evidence that stock market prices are "fundamentally" efficient, and Disciplinary raids involve significant transaction costs. Furthermore, there is little evidence that takeover targets are long term underperformers or that takeovers improve profitability.

3.

(a)

(i) Accountants use the phrase "a true and fair view" when discussing a companies accounts. This is merely a technical phrase meaning appropriate classification and disclosure of items and the consistent application of generally accepted accounting conventions or concepts.

(ii) The cost concept refers to the fact that in valuing assets, the original acquisition (historic) cost of assets is used. It is easily verifiable and therefore an objective value. However, if prices are unstable then values might be quite different to current market values, and a misleading picture of the business could be provided. Many companies periodically revalue certain assets so they reflect the market value; known as modified historic cost accounting.

(iii) The candidate should define Exceptional items as material items within ordinary activities and which need to be disclosed by virtue of their size. In contrast, extraordinary items are material items possessing a high degree of abnormality that fall outside ordinary activities and which are not expected to recur.

(iv) The candidate should define minority interests as that part of a subsidiary company's shareholders funds that is not held by the company. This item is usually shown as a separate item on the capital and liabilities side of a consolidated balance sheet. A good candidate may also discuss their treatment in the P&L.

(b)

PROFIT & LOSS ACCOUNT		2005
Turnover		659,000
Initial stock	54,500	
+Purchases	310,000	
-Final stock	60,000	
= cost of goods sold		(304,500)
Wages		(157,800)
Other expenses		(41,700)
Rent and rates		(33,000)
Depreciation		(34,500)
Bad debt		(10,000)
Operating Profit		77,500

Interest Paid	(2,500)
Profit before Tax	75,000
Taxation	(22,500)
Profit after Tax	52,500
Dividends	(10,000)
Retained Profits	42,500

	2005
Fixed Assets	300,750
Current Assets	
Stock	60,000
Debtors	59,000
Cash at Bank	176,000
Prepayments	3,000
Total assets	598,750
Current liabilities	
Creditors	40,000
Interest	2,500
Tax	22,500
Dividends	10,000
Net Assets	523,750
Long term liabilities	
Long term loan 5%	50,000
Total net assets	473,750
Ordinary shares of £1 each	150,000
Share Premium	175,000
Profit and Loss Account	148, 750
Capital & reserves	473,750

4 (a)

Rumbold Ltd. Cash Flow Statement for year ended 30 December 2005

	£	
Net cash inflow from operating activities	34,756	
Servicing of finance	(6,000)	(working 3)
Taxation	(25,700)	(working 4)
Capital expenditure	(11,000)	(working 5)
Equity dividends paid	(9,000)	(working 6)
Net Cash Flow before financing	(16,944)	
Financing	nil	
Decrease in cash	(16,944)	

Note 1: Reconciliation of operating profit to net cash flow from operating activities

	£	
Operating profit	41,771	(working 1)
Depreciation	15,800	(per question)
Increase in stocks	(12,764)	(working 2)
Increase in debtors	(18,547)	(working 2)
Increase in creditors	8,496	(working 2)
Net cash inflow from operating activities	34,756 1	

Working 1	Operating Profit		£
	Retained Profit	2004	345,496
	Retained profit	2005	367,267
thus	Retained profit for year		21,771
Add	Taxation charge		9,000
	Interest charge		6,000
	Dividends declared		5,000
			41,771

Working 2	2005	2004	Movement
	£	£	£
Stock	97,593	84,829	12,764 (increase = outflow)
Debtors	176,041	157,494	18,547 (increase = outflow)
Creditors	137,065	128,569	8,496 (increase = inflow)

Working 3	Interest paid	£
	Provision at 31.12.04	3,000
	Profit and loss charge	6,000
		9,000
	Provision at 31.12.05	3,000

=	Amount paid	6,000

		£	
Working 4	Taxation	£	
	Provision at 31.12.04	25,700	
Add	Profit and loss charge	9,000	
		34,700	
Less	Provision at 31.12.05	(9,000)	
=	Amount paid	25,700	

Working 5	Capital expenditure	£	
	NBV at 31.12.04	853,962	
Less	Depreciation for year	(15,800)	
		838,162	
	NBV at 31.12.05	849,162	
	Difference	11,000	= Additions

Working 6	Equity dividends paid	£
	Provision at 31.12.04	9,000
	Profit and loss charge	5,000
		14,000
	Provision at 31.12.05	5,000
=	Amount paid	9,000

(b) The company's cash position has deteriorated by £16,944 over the past year. This is particularly disappointing in light of the fact that an operating profit of £41,771 was earned. Perhaps the first point which can be noted from the cash flow statement is that although there was an investment of £11,000 in fixed assets, this was entirely funded from the cash generated by operating activities. While this may be appropriate as the amount of cash generated by operating activities (£34,756) was quite healthy and the capital expenditure was modest, when combined with other factors, the lack of additional external finance has contributed to the cash deficit. By looking more closely at the detail of the cash flow statement, and in particular Note 1, the Reconciliation of operating profit to net cash flow from operating activities it can be seen that the significant increases in the level of stock and debtors have been the major reasons for the cash deficit. Financing these increases has required just over £31,000 of cash. Clearly if these increases had been avoided, the cash position would be significantly better. Of course, this raises the question as to whether these increases were necessary. Given that there has also been an increase in the amounts owing to creditors, there is some evidence that the company is expanding through increased sales. It would be wise to consider the level of working capital in context, by calculating the stock holding period, and the debtors and

creditors payment periods. If the increases are due to a planned expansion, it may be that the original objective of creating cash was not realistic. This suggests that the company's planning procedures lack integration, and that decisions in one area (e.g. increased sales activity) do not feed into other decision making processes (e.g. cash forecasting). Of course, the fact that cash has been consumed will not be a major problem if there is sufficient working capital finance available through an existing overdraft facility, or if the growth in stock and debtors are the result of a planned expansion in sales. A final point to note is that the significant cash outflow in respect of the tax liability is based on last year's profits. Therefore the company's cash flow has been affected by an item which relates to the previous year's financial statements. This underlines the fact that careful planning is needed to ensure that in time of profitability, cash is not used in the short term without having regard to the need to meet the tax liability in the future.

Therefore the following action is suggested:
– consider arranging finance for future capital expenditure
– review existing overdraft and loan limits
– integrate the forecasting procedures to ensure that all decision are included
– review stock holding policy and systems for managing flow of stock
– review procedures for managing debtors
– negotiate longer credit period from main suppliers
– ensure that the tax liability is foreseen and included in cash forecasts

5.

(a) Divisionalisation refers to the delegation of profit-making responsibility. Divisionalisation is usually done on either products or geographical location. In both types of division, the divisional manager is held accountable for divisional performance. In practice, it appears that central management is more prepared to allow discretion over production and sales decisions than over capital expenditure decisions. Divisionalisation has the following advantages:

- Market information: Divisional managers will gather this and it maybe difficult and costly to transmit it to central management
- Management motivation: Divisional managers are more likely to be committed if they have control over divisional decisions
- Management development: Allowing divisional managers a degree of autonomy should help in their development
- Specialist knowledge: At the divisional level leads to better decisions than would be made by central management
- Strategic role for central managers: Best use of central managers time is for broader view of business and strategic thinking
- Timely decisions: Takes time to transmit information, divisional managers can usually respond quicker than central managers

And the following disadvantages:

- Goal conflict: Goals of operating division may be incompatible with those of either business as a whole or other decisions
- Risk avoidance: Divisional managers will avoid risky projects, although their diversified company may prefer to take the risk

- Management "perks": By allowing divisional managers autonomy, there is a danger they will award themselves substantial perks
- Increasing costs: By operating as divisions, additional costs may be incurred. There may be duplication of tasks in different divisions, or economies of scale may not be realised (i.e., bulk buying)
- Competition: Divisions offering similar products may compete with one another, resulting in lower prices and profits. For this reason, better that different divisions do not offer closely related products

(b) The pricing of goods and services that are bought and sold between divisions within the same group (transfer pricing) is renowned as a difficult issue. Economic theory suggests that where there is a .perfect market. the transfer price should be marginal cost (which will equal marginal revenue in a perfect market). However, very few companies operate in perfect markets. From this position it has been argued that where there is no external market for the good or service, marginal cost will always produce a transfer price that will maximise the profits of the whole group. Under restrictive assumptions this will be true, but it ignores the behavioural implications that arise, particularly for the divisions that make substantial losses. For example, if a division transfers all output at marginal cost it would produce a loss equal to its fixed costs. These behavioural implications are in many respects the key issue in determining a transfer price and they cannot be ignored.

Ideally a transfer price would cause each division to operate at a level that maximises the profits for the whole group. In reality this is not simply a technical issue as profits are determined in part by the motivation of managers. Some theorists have argued that the best transfer price is one that maximises the effort of managers. It is further argued that motivation is often improved by decentralization and autonomy and so the transfer price must be as close to market prices as possible. In fact there is good evidence that if a clear market price exists, that should be used as the transfer price, possibly with a small adjustment. However in many instances there is no single market price. This occurs whenever a product or service is unique for a particular customer, and may also occur when products and services are of different quality.

Many firms adopt a consistent approach to pricing regardless of whether the customer is another division or an external company. In most instances divisions set prices based on full cost plus a profit margin. The definition of cost and the size of the margin varies widely. Thus it is very common for transfer prices to be set using a cost plus formula. Some companies use this as a basis for negotiation between divisions, as there are good grounds for arguing that an internal transfer gives rise to lower costs than an external sale. For example there will be no marketing costs or bad debts. There are also a variety of complex formulas that have been devised to improve the motivational effects of transfer pricing, but there is little evidence that they are used.

(c) Before proposing transfer prices for Mitchells it would be helpful to outline the transactions that occur between divisions. These are shown in the table below.

Division	**Selling to**	**Goods/services sold**
Manufacturing	Rental	New televisions
	Second-hand	Old televisions accepted as trade-in on new purchases
Rental	Second-hand	Ex-rental televisions to be sold as second-hand televisions
Repair	Manufacturing	Work done under guarantee on sales of new televisions
	Second-hand	Reconditioning old televisions bought-in from manufacturing

	Work done under guarantee of sales of second-hand televisions
Rental	Repairs to televisions on lease

Transfer pricing is particularly important as the price forms part of the costs of one division and the revenue of another. As remuneration depends to some extent on profits, the transfer price is determining the pay of the divisional managers. Transfer prices will have to be set in such a manner that divisional managers accept them as fair, and at a level that leads to high motivation of divisional managers. Wherever possible, a price related to a market price would cause the least amount of dispute and achieve the highest degree of acceptance. Each division will now be considered.

Manufacturing
Sales of new televisions can be made at market price, or at the same price that Manufacturing sells to external customers. In fact as the volume would be large and the costs less than to external companies, a discount on market price would be given. This could apply to sales to Second-hand and Rental.

Sales of trade-in televisions to Second-hand is more difficult. Manufacturing could just transfer these at the price paid. However, the behavioural consequences are likely to be damaging. There would be a strong temptation for Manufacturing to give unrealistic trade-in prices to gain sales of new televisions, leaving Second-hand with these traded-in televisions at a very high price, and thus much lower profits. It may be possible to ascertain market prices by observing second-hand sales in the market (in magazines and the Internet), and using this as a basis for the transfer price.

Rental A similar situation arises here as with the transfer of second-hand televisions from Manufacturing. The same proposal is appropriate.

Repairs This division trades with the other three and has most to gain or lose by setting transfer prices. There may be a simple rule for pricing based on hours, but the problem would be ensuring efficiency. An hour-based pricing system rewards inefficiency. If the general public were quoted set prices for many of the jobs undertaken, this could be a basis for transfer prices. Otherwise it may be necessary to negotiate prices for specific routine jobs and agree the conditions when these prices would not apply. If a substantial proportion of the Repair division work was for external parties, it would lead to less pressure on internal work, and more data with which to set transfer prices.

In a company such as Mitchells there are no simple rules that will solve the transfer pricing problem. The secret of success may be to ensure good relations between the divisions. If trust and co-operation existed, setting transfer prices might be done with the good of Mitchells as a whole in mind, whereas if there were poor relations between the divisions it would be highly likely that each division would try to gain at another's expense.

6.

(a) It is important to a have knowledge of competitors cost and in particular cost structure Knowing the extent to which competitors costs are fixed or variable enables a business to make some estimation of the effect on their profit of an increase or decrease in sales. This can show how each competitor may react to changes in sales or price. For example, a competitor with a high level of fixed costs (high operating gearing) and, consequently a low margin of safety, may not be able to withstand a downturn in sales volume as

comfortably as another with lower fixed costs. Would a 10% price reduction be followed by competitors? If not, would they be able to continue to supply, given the likely sales reduction? It is often difficult in practice to obtain the information required on competitors. Businesses are reluctant to release information about themselves, probably partly to avoid competitors carrying out such analysis. UK limited companies are required by law to provide annual accounts to anyone interested, and this offers some useful information. Similar provisions relate to limited companies in rest of the world. Such information however, is of limited value in competitor profitability analysis because the competitor may not be whole company but a division, and in such cases, segment reporting is very limited to overall sales and profit. Firms will have knowledge of their own cost structure and may be able to make informed estimates for competitors. For example, if it knows that a competitor is more capital intensive, it may be able to estimate how costs differ. Possible to gain other information from wide range of sources including:

- Press coverage of competitors business
- Talking to customers who also trade with competitor
- Talking to suppliers who also trade with competitor
- Physical observation
- Government statistics on such maters as size of market

All of these can be pieced together in attempt to build up as full a picture as possible of each significant competitor. Traditionally, a business would know the effect on itself, but not on competitors. There will of course, be a practical limit on how much it is worth spending to gain more information.

(b) Customer profitability analysis assesses the profitability of each customer or type of customer. This is very valuable information, especially to the marketing function whose job is to attract and retain profitable customers. Assesses revenue and costs for each customer over past period. Costs will include basic cost of producing product for the customer, should be available from businesses product cost records, probably using ABC approach. Total customer costs will also include selling and distribution costs. The following information would be required:

- Handling orders from the customer
  - Costs involved with receiving the order and activities up to point where goods are dispatched, includes costs of raising invoices and another accounting work
- Visiting of the customer by sales staff
  - Many businesses have a member of staff visit customers, perhaps to take orders, but often to keep the customer up to date with latest products
- Delivery costs to customers
  - Distance travelled and the bulkiness and fragility of goods will have effect
- Stockholding costs
  - Some customers may require a particular level of stock to be held by the business
  - For example, a customer operating a "just-in-time" raw material stock policy will tend, in effect, to put pressure on the supplier to hold stock
- Credit costs
  - Business will have to finance any credit allowed to customers, which could vary from customer to customer, depending on how promptly they pay

(c) Many leading businesses now claim that the quest for shareholder value is the driving force behind their decisions. 'Shareholder value' means maximising financial return

relative to risk. Although the business may have many stakeholders, such as employees, customers and suppliers, under this approach it is the shareholders that should be seen as the most important group. Many businesses do not agree with this approach and believe that a balance should be struck between the different groups. However, since 1980, globalisation has resulted in more competitive markets and more competitive rates of return. Managers who do not adopt the shareholder value approach may find themselves supplanted by those that will.

Given a commitment to maximise shareholder returns, the next issue to decide on is how to measure it. Traditional approach is to use accounting profit or some ratio based on it such as earnings per share. However such measures have certain disadvantages

- One problem with this is that such measures can be improved in the short run by harming long run value (i.e., staff training)
- Secondly risk is ignored
- Third problem is that the profit measure does not take account of all the costs of the capital invested by a business
- Final problem is that accounting profit can vary according to accounting policy

A net present value approach can be adopted instead. It considers the long term, considering returns over the life of an investment. It takes account of risk and cost of capital, is not sensitive to the choice of accounting policies, uses cash rather than profit in the calculations and is a more objective measure of return. The business as a whole can be seen as a portfolio of investments and the NPV approach can be applied to the business as a whole. Extending NPV analysis to the overall firm is known as *shareholder value analysis*. Supporters of SVA believe this measure should replace the traditional accounting measures of value creation such as profit. It is a radical departure from the conventional approach to managing a business, requiring;

- Different performance indicators
- Different financial reporting systems
- Different management incentive methods
- Change of culture within business to accommodate the shareholder value philosophy

If SVA is implemented, it can provide the basis of targets for managers to work towards, on a day-to-day basis, that should promote maximisation of shareholder value. The practical problems in using an SVA approach are forecasting future cash flows and the extra information required

(d) Financial measures are clearly of vital importance. However, in recent years there has been increasing recognition that financial measures alone will not provide managers with sufficient information to manage a business effectively. Non-financial measures must also be used in order to gain a deeper understanding of the business and to achieve the objectives of the business, including the financial objectives. These value drivers may be such things as employee satisfaction, customer loyalty, product innovation. Often they do not lend themselves to financial measurement, although non-financial measures may provide some means of assessment. Employee satisfaction may be measured through an employee survey, which could examine various aspects of the job:

- Degree of autonomy that is permitted
- The level of recognition and reward received
- The level of participation in decision making
- The degree of support received in carrying out tasks etc

Less direct measures of satisfaction may include employee turnover rates and employee productivity. Customer loyalty may be measured through proportion of total sales generated from existing customers, or the number of repeat sales. Product innovation may be measured through number of innovations relative to competitors, % of sales attributable to recent product innovations, number of innovations brought successfully to market. Financial measures are normally 'lag' indicators and tell us about outcomes whilst non-financial measures can instead be used as 'lead' indicators by focusing on things that drive performance. If we measure changes in these value drivers, we may be able predict changes in future financial performance. For example, a firm may find that a 10% fall in product innovation in one period may lead to a 20% fall in sales over next three periods. In this case, the levels of product innovation can be regarded as a lead indicator that can alert managers to a future decline in sales unless corrective action is taken. Managers can thus respond much quicker

(e)

The balanced scorecard approach attempts to integrate the use of financial and non-financial measures. It provides a framework that translates the aims and objectives of the business into a series of key performance measures and targets. This arguably makes the strategy more coherent. As a result, managers should be able to see more clearly whether the objectives that have been set have actually been achieved. An overall balanced scorecard will be prepared for the business as a whole, and then if necessary for each sub unit. It does not prescribe the particular objectives, measures or targets that a business should adopt. The approach involves setting objectives and measures in 4 areas:

1. Financial
   - Specify the financial returns required
   - Establish the use of financial measures to meet to these objectives such as shareholder return

2. Customer
   - Specify the kind of customer and/or markets the business wishes to service
   - Establish appropriate measures such as customer satisfaction, new customer growth levels

3. Internal business process
   - Specify those business processes (for example, innovation, types of operation, and after sales service) that are important to success of business
   - Establish appropriate measures such as % of sales from new products, time to market for new products, product cycle time, and speed of response to customer complaints

4. Learning and growth
   - Specify the kind of people, systems and procedures that are necessary
   - Establish development of appropriate measures such as employee motivation, employee skills profiles, information systems capabilities
   - Although a very large number of measures can be used, only a handful should be employed
   - A maximum of 20 will normally be sufficient to capture the factors that are critical to success
   - The key measures should be a mix of lag and lead indicators

- The balanced scorecard approach does not dull the importance of financial measures - because the non-financial measures must lead back to the financial objectives
- There must be a clear cause-and-effect relationship
- The example of an investment in staff development and how this leads to a financial objective is shown on the following slide

7.

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. In practice, there are many other factors that determine the gearing level such as size, risk, ownership position, growth and these should be discussed. The variation in gearing across countries might also be mentioned.

8. The answer to this question should first define what risk is. Risk is essentially a condition in which there exists a quantifiable dispersion in the possible outcomes from any activity. Companies are most concerned about 'downside' risks. These are risks that something could go wrong, and the risk of losses resulting in negative cash flows. The scale or size of any risk depends on both its probability of occurring and its impact. Risk can be categorized into business risk and non-business risk. Business risk consists of product risk (i.e. sales lower than expected), macro-economic risk (i.e. economy goes into recession), and technological risk (unexpected changes in technology alter business environment). Non-business risk includes financial risk (gearing risk, interest rate risk, foreign exchange risk), event risk (disaster risk, political risk, litigation risk, reputation risk), and operational risk (risk of losses from failed or inadequate systems or human error, the failure to manage a major project successfully). Companies cannot avoid risks since business by its very nature involves taking risks in order to exploit profitable opportunities. However, a company should not take unnecessary risks, nor should it take risks that shareholders would not expect. The management of a company should therefore consider what level of risk is acceptable, and how total risks should be controlled. Over last 20 years there has been an increased awareness of an organization's need to manage risk. Until late 1980s, risk management policy involved setting conservative limits on the extent of any risk activity, thus preventing any adverse consequences from escalating within given parameters. These parameters were normally based on simple estimates of the risk, on case by case basis, without considering overall company risk. Where a risk was deemed to exceed these parameters it was, if possible, transferred to a third party such as an insurer. However, financial scandals such as Barings Bank drew attention to the importance of risk management. There are an ever increasing number of tools, techniques and instruments which can be used to manage risk. These include discretionary activities such as treasury management and hedging strategies. There are also non-discretionary systems including internal and external audit, listing and reporting requirements. Directors of UK listed companies are now required to include a report on risk management in the annual report under the Combined Code on Corporate Governance as a result of the Turnbull Report in 1999. This report argued that companies should have in place an effective risk management system which would have both a risk audit and risk mapping system. The advantages and implications of adopting such an approach should be considered. The answer could then consider the use of financial instruments such as options, swaps, futures and forward contracts.