MANUFACTURING ENGINEERING TRIPOS PART IIA

Friday 27 April 2012 9 to 12

PAPER 5

Module 3P8: FINANCIAL AND MANAGEMENT ACCOUNTING
(Sections A and B)

Module 3P9: INDUSTRIAL ECONOMICS, STRATEGY AND GOVERNANCE
(Sections C and D)

*Answer not more than **four** questions, **one** from each of sections **A, B, C** and **D**.*

*Answers to sections **A, B, C** and **D** must appear in four separate booklets.*

All questions carry the same number of marks.

*The **approximate** percentage of marks allocated to each part of a question is indicated in the right margin.*

There are no attachments.

STATIONERY REQUIREMENTS
8 page answer booklet x 4
Rough work pad

SPECIAL REQUIREMENTS
Engineering Data Book
CUED approved calculator allowed

You may not start to read the questions printed on the subsequent pages of this question paper until instructed that you may do so by the Invigilator

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SECTION A

*Answer **one** question from this section.*

1 (a) The income statement of Pigou for the year to 30 November 2011 reported a profit before tax of £132,593, after charging:

Depreciation £8,742

Interest £5,844

The company does not hold any inventory, and no credit is granted to customers. The amount owed to suppliers at 30 November 2011 was £9,429 greater than the amount owed at 30 November 2010. During the year the taxation liability of £7,374 was paid. No interest was owed at either 30 November 2010 or at 30 November 2011.
What amount should be reported as 'Net cash from operating activities' in the cash flow statement for the year to 30 November 2011? [10%]

(b) At 31 October 2011 the non-current assets of Tobin had a net book value of £754,860 and a tax written down value of £543,875. At 31 October 2010, the company's provision for deferred tax was £39,853. The tax rate is 20%.
What amount should be reported in the income statement for the year to 31 October 2011 for deferred tax? [10%]

(c) On 1 February 2012, Friedman Co acquired 480,000 of the 600,000 ordinary shares of Samuelson Co at a price of £4.28 per share. At that date the book value of the net assets of Samuelson Co was £2,356,920, and the fair value of land owned by Samuelson Co exceeded the book value by £110,000.
Assuming that the full fair value method of valuation is used, what is the value of goodwill on acquisition? [10%]

(d) The financial performance of Kalecki Co for the most recent year produced the following ratios:

Dividend cover 5 times

Interest cover 6 times

Dividend per share £0.20

The company has ordinary share capital of £10m made up of £0.50 ordinary shares. The company pays tax at 20%.
What is the net profit before interest and taxation of the company? [10%]

(e) The directors of Keynes Co are assessing the terms of a proposed investment in Black Co. There are two possible ways in which the investment might be made. These are:

Option 1: Acquire 70% of the ordinary shares at a price of £4.10 per share. If this option is taken, the current board of directors of Black would resign and be replaced by nominees of Keynes.

Option 2: Acquire 45% of the ordinary shares at a cost of £3.70 per share, and nominate a director of Keynes to sit on the board of directors of Black.

In both cases, the investment would be made on 1 August 2010, and the shares acquired will be paid for in cash. The directors have prepared forecast balance sheets at 31 July 2011 for both companies. These do not reflect the impact of either investment. The directors believe that if the investment is undertaken, the results of Black will be improved. The forecast balance sheets at 31 July 2011 are shown below:

	Keynes	**Black**
	£000	**£000**
Non-current assets	580	120
Current assets		
Inventory	75	47
Receivables	120	41
Cash	240	–
	435	88
Total assets	1,015	208
Equity		
Share capital (£1 shares)	460	80
Retained profit:		
At 1 August 2010	310	76
Year to 31 July 2011	60	18
	830	174
Current liabilities		
Payables	185	27
Bank overdraft	–	7
	185	34
Total liabilities and capital	1,015	208

The directors have asked you to advise them as to the correct accounting treatment of the investment in the consolidated balance sheet under both option 1 and option 2.

(i) For each of the two options: explain the nature of the investment which would arise; and describe how the investment should be reported in the consolidated balance sheet. [20%]

(ii) Assuming that the directors decide to acquire 70% of the shares in Black (option 1), prepare the forecast consolidated balance sheet of the Keynes Group at 31 July 2011. [40%]

2 (a) Coase Co has ordinary shares in issue with a nominal value of £10 and a current market value of £12.00. The dividend payout ratio is 40% and the price earnings ratio is 10 times. What is the gross dividend yield? [10%]

(b) Two companies are the same in every respect except for their gearing. Sen Co is financed entirely by equity and Nash Co is financed by a mixture of debt and equity and pays £15,000 per year interest on the debt. Sen Co has 250,000 shares in issue and Nash has 150,000 shares in issue. The tax rate is 20%.
What is the level of profits before interest and tax at which the earnings per share for each company will be the same? [10%]

(c) In the financial year to 31 May 2008, Marshall Co purchased a new head office. The costs of the purchase were:

Land on which building is located	£300,000
Building	£550,000
Site preparation	£25,000
Service charge for year to 30 September 2011	£60,000

At 31 May 2009, the market value of the head office had increased by £100,000. This increase in value was recognised in the financial statements for that year. After the depreciation charges for the two years to 31 May 2011 the carrying value of the head office at that date was £926,250. During the year to 31 May 2011 the market value of the property fell to £830,000.
What is the original value at which the head office was recorded in the year to 31 May 2008 and what amount will be charged in the income statement for the year to 31 May 2011 in respect of the reduction in the value of the property? [15%]

(d) A statement of financial position (balance sheet) reports assets and liabilities, both of which are classified as either 'current' or 'non-current'.

(i) Define the terms 'asset' and 'liability' and explain the basis on which each of these is classified as either 'current' or 'non-current'. [10%]

(ii) Provide one example each of a current asset, a non-current asset, a current liability and a non-current liability. [5%]

(e) Stan Metcalfe is a sole trader. He has prepared the following trial balance at 30 November 2011:

	Debit £	Credit £
Sales		156,843
Goods for resale	86,328	
Wages	24,442	
Electricity	4,729	
General expenses	1,448	
Equipment at cost	42,700	
Motor vehicles at cost	25,500	
Accumulated depreciation at 1 December 2010:		
Equipment		24,588
Motor vehicles		16,320
Inventory at 1 December 2010	10,563	
Trade receivables	15,649	
Trade payables		13,387
Bank account	653	
Capital at 1 December 2010		23,374
Drawings	22,500	
	234,512	234,512

The following information also has to be taken into account:

1. The depreciation charges for the year are: Equipment £6,405; and Motor vehicles £5,100.
2. Inventory at 30 November 2011 is valued at £12,640.
3. At 30 November 2011, Stan's accrued expenses were £1,564.
4. At 30 November 2011, Stan's prepaid expenses were £955.

(i) Indicate the effect of each of the items (1.) to (4.) above on the basic accounting equation (assets – liabilities = capital). [10%]

(ii) Prepare Stan's statement of financial position (balance sheet) as at 30 November 2011. [40%]

SECTION B

*Answer **one** question from this section.*

3 (a) In the last four-week operating period, the 11 staff in the customer services section of Modigliani Co resolved 2,850 customer queries. The standard time for resolving a query is 1/2 hour. The staff work a 35 hour week, of which five hours are required for administration and training. The standard cost per query is £11.38.
What is the labour efficiency variance for the last four-week operating period? [10%]

(b) Krugman Co is about to launch a new product. The profit will be dependent on the selling price and the level of market acceptance. The sales director has the following information regarding the expected profit for various combinations of selling price and market acceptance:

Profit $000	Selling price			
	$12	$13	$14	$15
Market acceptance				
Strong	362	370	381	388
Moderate	310	324	330	334
Low	288	296	275	264

If the maximin decision criterion is used, what selling price should be chosen? [10%]

(c) The cost of one of the products produced by Mundell Co is currently calculated as follows:

Direct costs	£5.78
Overheads	£9.38 (based on 0·4 labour hours per unit)
Total cost	£15.16

A cost analysis exercise indicated that there are two categories of overhead costs, processing and handling. The table below shows the total cost of each activity, and the volume of the associated cost drivers.

Activity	Cost	Cost drivers	Volume of cost driver
Processing	£17,500	Labour hours	2,187.5
Handling	£33,810	Purchase orders	48,300

Six purchase orders are required for each unit produced.

If the data from the cost analysis exercise is used as the basis for Activity Based Costing, what is the revised cost per unit? [10%]

(d) Phelps Engineering Co buys raw materials from suppliers on four weeks' credit and they are delivered immediately. When the raw materials are received, they are held in the warehouse for five weeks before being used in production. The production process takes one week and the completed goods are held for two weeks before finally being sold to credit customers. These customers are allowed a maximum credit period of six weeks but pay after three weeks in order to obtain a discount for prompt settlement.

What is the opening cash cycle of the business? [5%]

(e) Williamson Co develops and manufactures drills for businesses operating in the oil and gas industry. Although it is committed to maximising the wealth of its shareholders, the company has incurred heavy losses over recent years. A new chief executive has now been appointed to revive the flagging fortunes of the company. As part of the revival process, a review has been ordered of all projects involving new drills that were either still being developed or were already developed and about to be launched.

Project XK150 began in 2010 and has incurred costs of £4 million, to date, in developing and testing a new drill for use in offshore oil rigs. The project had experienced numerous problems and the drill has taken longer than expected to develop but it will be ready to market from December 2011. The new drill is expected to generate sales over a four year period, after which it will be replaced with an improved version. The manager of Project XK150 has produced the following calculations to aid the review process:

Year to 30 November	2012	2013	2014	2015
	£m	£m	£m	£m
Revenue	18.3	22.5	12.6	7.2
Less				
Salary and wages	(12.7)	(14.4)	(6.6)	(2.5)
Materials and components	(2.3)	(3.5)	(1.5)	(0.6)
Overheads	(4.8)	(4.8)	(4.8)	(4.8)
Depreciation	(2.0)	(2.0)	(2.0)	(2.0)
Development costs	(1.0)	(1.0)	(1.0)	(1.0)
Interest charges on loan	(1.5)	(1.5)	(1.5)	(1.5)
Profit/(loss)	(6.0)	(4.7)	(4.8)	(5.2)

The manager of Project XK150 is dismayed by the above results and believes that the new chief executive will call an immediate halt to the proposed launch when the results are presented to him. Before making the presentation, however, the project manager has asked you to check the figures that he has produced.
When going through the figures, you find the following:
1. The materials and components are already in stock and were purchased specifically for producing the new drills. The materials and components are highly specialised and cannot be used for any other project. They have no ready market value and, if the new drills are not manufactured, the materials and components will have to be disposed of immediately at a cost to the company of £0.2 million.
2. The overheads reflect a 'fair share' of the total overheads incurred by the company. However, the overheads that relate specifically to the project account for only 25% of the amount shown in each period.
3. The depreciation charge relates to existing plant and equipment which will be required for the manufacture of the new drills. This plant and equipment has a current net book value of £8.0 million and a current resale value of £6.0 million. If the project goes ahead, the plant and equipment will be sold for £2.0 million at the end of the project's life.
4. Working capital of £2.5 million will be required immediately and will be released at the end of the four-year period of the life of the new drills.
5. The development costs relate to the costs incurred during the period up to 30 November 2011. It is the policy of the company to write off development costs in equal annual instalments over the period in which revenues are generated.
6. Interest charges arise from a loan that was taken out specifically to finance the development and manufacture of the new drills.

You can assume the calculations provided by the manager of Project XK150 contain no arithmetic errors. The company has a cost of capital of 10% and you can ignore taxation.

(i) Calculate the net present value of the new drill and briefly comment on the viability of the project. [40%]

(ii) Explain the reasons for any adjustments that you have made to the figures provided in order to calculate the net present value of the new drill. [20%]

(iii) Briefly explain why the net present value method is an appropriate method to use when assessing the financial viability of the new drill. [5%]

4 (a) The operating profit for the year to 30 November 2011 of a division of Solow Co is £586,900, and the tax charge for the year is £95,600. The net assets of the division have a book value of £2,569,800 and an economic value of £3,180,000. The division's cost of capital is estimated to be 14%.
What is the division's residual income and its Economic Value Added? [10%]

(b) In the last production period, Heckman Co budgeted to produce 18,000 units with a standard material cost of £72,000. Each unit has a standard material input of 2 kg. Actual production volume was 18,600 units, and 39,060 kg of material was used at a cost of £76,167.
What is the materials price variance? [10%]

(c) Stiglitz Co is considering four separate investment opportunities but only has limited funds to invest during the current year. This means that the company will not be able to invest fully in all four opportunities. Each investment opportunity is divisible (i.e. it is possible to undertake part of an investment and to receive a pro rata return). Details of each investment opportunity are as follows:

Investment opportunity	Initial outlay	Present value of net cash inflows
	£m	£m
Kaldor	186	211
Godley	65	84
Stone	100	120
Cripps	50	71

How should the investment opportunities be ranked if Stiglitz Co wishes to maximise the wealth of its shareholders? [5%]

(d) Lucas Co is planning to introduce a new product. The company seeks to obtain a 25% margin on all products. The direct cost of the new product is £124.50 per unit and the overhead cost is £91.20 per unit. Market research indicates that the likely selling price should be £265.00. You have been asked to carry out a target cost pricing exercise.
What reduction in cost must be made to achieve the target cost? [10%]

(e) Robinson Ltd has been trading for several years, making a limited range of ornamental features for domestic gardens. In that time he has established a reputation with his customers for providing good value for money. He has decided to expand his business by increasing his product range and selling via the internet.

To date, his practice has been to provide the customer with a written quotation in advance. When preparing quotations he calculates the price of his products by absorbing overheads into product cost at a standard rate, based on labour hours. On average each job requires 27 labour hours. He is a little concerned that his present approach to pricing may be too simplistic for his expanded business, and that he ought to consider the use of activity based costing (ABC).

He has asked you to assist him in investigating whether ABC is appropriate for his business. You have estimated his total overheads for the next year will be £1,810,000. You have analysed these as follows:

Machine costs	£840,000
Maintenance	£395,000
Materials handling	£260,000
Sales order processing	£315,000

You estimate that the machine costs are variable costs, with the total expenditure being determined by the number of hours of use. In the next year, the machines are expected to run for 24,000 hours.

The maintenance cost has three components, machine set up, preventative maintenance and repairs. Preventative maintenance, which represents 40% of the maintenance cost, is carried out on the basis of the planned machine hours. Repairs tend to reflect the level of use of the machine. 22% of the maintenance cost is for repairs. The balance of the maintenance cost is for machine set up, with 200 production runs expected in the next year.

Materials are ordered from suppliers on a planned delivery basis, with 20 deliveries each week. As the production staff work in shifts, production will operate throughout the year, with no breaks for holidays.

Customers will place sales orders by telephone and via the internet. Robinson Ltd anticipates that internet sales will account for 60% of the order processing cost. He estimates that 36,000 orders will be received via the internet, while 12,000 telephone sales will be received. Each order is treated as a separate job.

(i) Calculate the overhead cost of an average job based on both Robinson Ltd's current pricing policy and ABC. [55%]

(ii) Discuss whether Robinson Ltd should adopt ABC [10%]

SECTION C

*Answer **one** question from this section*

5 Two profit maximising firms operate in a single market producing products which are substitutes of one another. The market price for the product is given by the following demand curve:

$$P = 2000 - (1/4)X$$

where P is the price and X is the yearly demand.

The yearly cost functions for firm 1 and firm 2 for producing their products are given by:

$$TC_1 = 9000 + 200Q_1$$

$$TC_2 = 8000 + 100Q_2 + 2Q_2^2$$

where TC_1 is the total cost for firm 1, and TC_2 is the total cost for firm 2, Q_1 is the quantity produced by firm 1 and Q_2 is the quantity produced by firm 2.

(a) Assuming that this is a Cournot duopoly find the equilibrium price, output and profits of each firm. [40%]

(b) Assuming instead that firm 2 has perfect knowledge of firm 1's reaction function (Stackelberg model) calculate the price, profits and outputs for both firms. [40%]

(c) Discuss the key assumptions of a perfectly competitive market and when they may or may not hold. [20%]

6 Assume that the UK pharmaceutical market has 10 companies operating with the percentage market shares as shown in Fig. 1.

Company	A	B	C	D	E	F	G	H	I	J
Mkt share %	12	15	10	4	10	3	3	10	3	10

Fig.1 market shares for the 10 companies in the UK pharmaceutical market

(a) Is the market under concentrated, moderately concentrated or highly concentrated according to the accepted criteria for the Herfindal-Hirschmann Index (HHI)? [30%]

(b) If companies A and C planned to merge, would the merger be allowed under the accepted criteria for the HHI? Under what conditions might the decision to allow or not allow the merger be reversed? What other factors would be considered in making the decision? [40%]

(c) Why might using the concentration ratio as an alternative measure of concentration be preferable to using the HHI? [30%]

SECTION D

*Answer **one** question from this section*

7 (a) Describe the general model of industry lifecycle and how the industry conditions change through each stage of the model. [30%]

(b) (i) How might a company's basis of competition change as their industry evolves?

(ii) What changes might be necessary in their strategic positioning? [50%]

(c) What activities might a company focus on as its industry comes to the end of the lifecycle? [20%]

8 The PESTEL framework is one of a number of frameworks which are used to organise analysis of the macro environment for a company.

(a) Outline the elements of the PESTEL approach to analysis strategic context and provide a PESTEL analysis for the UK pharmaceutical industry. [30%]

(b) How might the advent of personalised medicine, where treatments are adapted to individual patients based on their genetic makeup, change the analysis in (a) for the pharmaceutical industry? [40%]

(c) Compare the PESTEL approach to assessing the environment for strategy development to one based on Porter's Five Forces model. [30%]

END OF PAPER