

Intermediate Level

Management Accounting – Decision Making

9

IDEC

19 November 2003
Wednesday afternoon

INSTRUCTIONS TO CANDIDATES

Read this page before you look at the questions

You are allowed three hours to answer this question paper.

Answer the ONE question in section A (this has 7 sub-questions).

Answer the ONE question in section B.

Answer ONE question ONLY from section C.

Answer ONE question ONLY from section D.

Maths tables and formulae were provided within the question paper and area available elsewhere on the website.

Write your examination number, your contact ID and your name on a double-sided card, which must be attached to your answer book.

Write IDEC on the line marked "Subject" on the front of the answer book.

Write your examination number on the special answer sheet for section A which is on page 3 of this question paper booklet.

Detach the sheet from the booklet and insert it into your answer book before you hand this in.

Do NOT write your name or your contact ID anywhere on your answer book.

Tick the appropriate boxes on the front of the answer book to indicate which questions you have answered.

SECTION A — 20 MARKS
ANSWER ALL SEVEN SUB-QUESTIONS

Each of the sub-questions numbered from **1.1** to **1.7** inclusive, given below, has only **ONE** correct answer.

Required:

On the SPECIAL ANSWER SHEET opposite, place a circle "O" around the letter that gives the correct answer to each sub-question.

If you wish to change your mind about an answer, block out your first answer completely and then circle another letter. You will not receive marks if more than one letter is circled.

Please note that you will not receive marks for any workings to these sub-questions.

You must detach the special answer sheet from the question paper and attach it inside the front cover of your answer book before you hand it to the invigilators at the end of the examination.

Question One

1.1 A food processing company operates an activity based costing (ABC) system. Which of the following would be classified as a facility-sustaining activity?

- (i) General staff administration
- (ii) Plant management
- (iii) Technical support for individual products and services
- (iv) Updating of product specification database
- (v) Property management

- A** (i) and (ii)
- B** (i), (ii) and (v)
- C** (ii), (iii) and (iv)
- D** (ii), (iii), (iv) and (v)
- E** All of them

(2 marks)

The following data relate to both questions 1.2 and 1.3

PQ Ltd produces three products, A, B and C, from two processes. The slack / surplus variables for process 1 hours, process 2 hours and the maximum demand for product A are s4, s5 and s6 respectively.

The contribution per unit for each of the products is as follows:

A	\$400
B	\$200
C	\$100

The following linear programming solution has been determined in order to maximise contribution for the forthcoming period.

Simplex Tableau							
	A	B	C	s4	s5	s6	Solution
B	0	1	0.83	0.33	0	-0.67	506.7
s5	0	0	0.33	-0.67	1	-1.67	586.7
A	1	0	0	0	0	1	200
Z	0	0	*	66.67	0	266.7	181333.3

* This box has been deliberately left blank.

1.2 If the company could increase production time in process 1 by 10 hours, the increase in total contribution would be nearest to

- A** \$700
- B** \$2,000
- C** \$2,700
- D** \$5,100
- E** \$5,900

(2 marks)

1.3 If eight additional units of Product C were produced, the change in total contribution would be nearest to a

- A** \$500 Decrease
- B** \$500 Increase
- C** \$800 Decrease
- D** \$800 Increase
- E** \$4,000 Decrease

(2 marks)

The following data relate to both questions 1.4 and 1.5

P Ltd currently sells 90,000 units of product Y per annum. At this level of sales and output, the selling price and variable cost per unit are £50 and £21 respectively. The annual fixed costs are £1,200,000. The management team is considering lowering the selling price per unit to £45.

The estimated levels of demand at the new price, and the probabilities of them occurring, are:

Selling price of £45

<i>Demand</i>	<i>Probability</i>
100,000 units	0.45
120,000 units	0.55

It is thought that at either of the higher sales and production levels, the variable cost per unit, and the probability of it occurring, will be as follows:

<i>Variable cost (per unit)</i>	<i>Probability</i>
£20	0.40
£18	0.60

1.4 The probability that lowering the selling price to £45 per unit would increase profit is

- A** 0.18
- B** 0.21
- C** 0.25
- D** 0.33
- E** 0.82

(4 marks)

1.5 The expected value of the company profit if the selling price is reduced to £45 per unit is

- A** £639,000
- B** £1,069,200
- C** £1,708,200
- D** £2,040,000
- E** £3,652,000

(4 marks)

The following data relate to both questions 1.6 and 1.7

RJD Ltd makes and sells a single product, Z. The selling price and marginal revenue equations for product Z are as follows:

$$\text{Selling price} = £50 - £0.001x$$

$$\text{Marginal revenue} = £50 - £0.002x$$

The variable costs are £20 per unit and the fixed costs are £100,000.

1.6 In order to maximise profit, the selling price per unit should be

- A** £25
- B** £30
- C** £35
- D** £40
- E** £50

(3 marks)

1.7 If the selling price was set to maximise **revenue**, the resulting profit would be

- A** £25,000
- B** £125,000
- C** £175,000
- D** £225,000
- E** £375,000

(3 marks)

(Total = 20 marks)

SECTION B – 30 MARKS

ANSWER THIS QUESTION, showing supporting calculations where appropriate

Question Two

W Ltd is a division of PK Glass plc. W Ltd produces commercial window glass. The glass is fragile and must be packaged very carefully. The packaging is done internally in W Ltd's packaging department by an automated packaging machine. The estimated annual cost, based on the current costs of the packaging department, is as follows:

	£000
Prime cost	700
Departmental overhead	
Supervisors' salaries	70
Rent	50
Depreciation of machinery	190
Maintenance of machinery	100
Allocation of general overhead	<u>140</u>
	<u>1,250</u>

Although the machinery is only two years old, it has become unreliable and costly to maintain. The machinery cost £1 million and had an estimated useful life of five years, after which it could be sold as scrap for £50,000. If the machinery was scrapped today it would generate £70,000.

In order to reduce packaging costs, the management team of W Ltd is considering two alternatives from two external companies (X Packaging Ltd and Y Ltd):

Alternative 1 – Closure of the packaging department

X Packaging Ltd has offered to undertake all of the packaging for a fixed fee of £950,000 per annum for the next three years. If W Ltd accepts this offer, its packaging department would be closed down.

Details relating to the closure are:

Buildings

The buildings currently used by W Ltd's packaging department would be used by another department in W Ltd that currently pays rent of £60,000 per annum for accommodation.

Direct labour

30% of the estimate for prime cost is direct labour. Redundancy payments of 10% of the annual wages will be paid.

Direct materials

The packaging materials currently held in stock have a book value of £100,000 and a scrap value of £20,000. The current replacement cost of the materials is £125,000.

Supervisors

The supervisors would be redeployed in another department within W Ltd.

Alternative 2 – Sub-contract the maintenance

Y Ltd has offered to maintain the machinery for a fixed fee of £80,000 per annum for the next three years.

Taxation

W Ltd incurs 30% tax on corporate profits. Tax allowances on the cost of the packaging machine are 25% per annum on a reducing balance basis. At the end of the machine's life, a balancing charge or allowance will arise equal to the difference between the scrap proceeds and the tax written-down value. Corporation tax is payable 50% in the year in which the profit is earned and 50% in the following year.

The company's after-tax cost of capital is 12%.

Required:

- (a) Determine which of the alternatives is the best one from a financial point of view. (You should show all calculations and state any assumptions that you have made.) (17 marks)

- (b) Briefly discuss any other issues which might affect the recommendation you have made in your answer to part (a). (3 marks)

- (c) The evaluation of the performance of the Divisional Manager of W Ltd is based on the division's pre-tax residual income.

The current (that is, at the end of the machinery's second year) value of the capital employed by W Ltd is £2.5 million.

Required:

Write a report to the management team of W Ltd. The report should explain and demonstrate for each of the two alternative proposals, the impact they would have on the calculation of W Ltd's residual income at the end of the first year of their implementation.

- (Do not calculate the residual income at the end of the first year.) (10 marks)

(Total = 30 marks)

SECTION C – 25 MARKS

ANSWER ONE QUESTION ONLY, showing supporting calculations where appropriate

Question Three

FF plc is a bank that offers a variety of banking services to its clients. One of the services offered is aimed at high net worth individuals and the bank is currently reviewing the performance of its client base.

The high net worth clients are classified into four groups based on the value of their individual liquid assets deposited in FF plc. The following annual budgeted information has been prepared:

Group	W	X	Y	Z	
Individual value (000s)	\$500-\$999	\$1,000-\$2,999	\$3,000-\$5,999	\$6,000-\$9,999	
Number of clients	1,000	1,500	2,000	1,800	
	\$000	\$000	\$000	\$000	<i>Total</i>
Total contribution	500	900	1,400	2,500	5,300
<i>Overheads:</i>					
Share of support costs	285	760	790	1,165	3,000
Share of facility costs	<u>100</u>	<u>160</u>	<u>240</u>	<u>500</u>	<u>1,000</u>
Profit/(loss)	<u>115</u>	<u>(20)</u>	<u>370</u>	<u>835</u>	<u>1,300</u>

FF plc is about to implement an activity based costing (ABC) system. The implementation team recently completed an analysis of the support costs. The analysis revealed that these costs were variable in relation to certain drivers. The details of the analysis are shown below.

Group	W	X	Y	Z	Total
Activity	000s	000s	000s	000s	000s
Number of telephone enquiries	200	150	220	300	870
Number of statements prepared	120	120	240	480	960
Number of client meetings	60	100	110	200	470

Activity	Support costs / Overheads
	\$000
Telephone enquiries	1,000
Statements prepared	250
Client meetings	<u>1,750</u>
Total	<u>3,000</u>

The Bank Manager feels that the low profitability from client Group W and the losses from client Group X need to be investigated further and that consideration should be given to discontinuing these services and concentrating the marketing and sales effort on increasing the number of clients within Group Y and Group Z. He has outlined two proposals, as follows:

Proposal 1

Discontinue both of Groups W and X in order to concentrate on Groups Y and Z (so that the bank would have only two client groups). If this option were implemented, it is expected that the facility costs would increase by 10%.

The Marketing Manager has calculated the probability of the number of clients the bank would serve to be as shown below.

Projected revised numbers of clients in Groups Y and Z

Group Y		Group Z	
Client numbers	Probability	Client numbers	Probability
2,250	0.30	2,000	0.20
2,500	0.40	2,200	0.50
2,750	0.30	2,500	0.30

Proposal 2

Discontinue either Group W or Group X in order to concentrate on Groups Y and Z (so that the bank would have three client groups). If this option were implemented, it is expected that the facility costs would increase by 8%.

If this proposal is implemented, the Marketing Manager estimates that the **increase** in client numbers in Groups Y and Z would be reduced by 75%, compared with proposal 1.

Required:

- (a) Prepare a customer profitability statement based on the ABC analysis and comment on your results. (8 marks)
- (b) Using the ABC details, evaluate the proposal of the Bank Manager (your answer must be supported by calculations). (9 marks)
- (c) When the bank's annual budget was prepared, it was thought that the bank would have a 25% share of the total market of 10,000 Group Y clients. However, for that year the total market size was 9,500 Group Y clients, of which the bank had 2,750.

Required:

- (i) Calculate on a contribution per unit basis the
 - market size variance, (2 marks)
 - market share variance (2 marks)
 - (ii) Explain and interpret these variances for the bank. (4 marks)
- (Total = 25 marks)**

Question Four

FB Ltd makes and sells a single product. The standard cost and revenue per unit are as follows:

		£
Selling price		400
Direct material A	5 kg at £25 per kg	125
Direct material B	3 kg at £22 per kg	66
Direct labour	3 hours at £10 per hour	30
Variable overheads	3 hours at £7 per hour	<u>21</u>
Standard contribution		<u>158</u>

The budgeted production and sales for the period in question were 10,000 units.

The mix of materials can be varied and therefore the material usage variance can be subdivided into mix and yield variances.

For the period under review, the actual results were as follows:

Production and sales		9,000 units
		£
Sales revenue		4,455,000
Material cost	A – 35,000 kg	910,000
	B – 50,000 kg	1,050,000
Labour cost	30,000 hours	385,000
Variable overhead		230,000

The general market prices at the time of purchase for material A and material B were £21 per kg and £19 per kg respectively.

There were no opening or closing stocks during the period.

Required:

- (a) Prepare a statement detailing the variances (including planning and operational, and mix and yield variances) which reconciles the budgeted contribution and the actual contribution. (14 marks)
- (b) Discuss the results and usefulness to FB Ltd of the planning and operational, and mix and yield variances that you have calculated in your answer to part (a). (6 marks)
- (c) Assuming that during the period the availability of labour had been restricted to 30,000 hours, discuss the validity of the labour efficiency variance you have calculated in your answer to part (a) above. (5 marks)

(Total = 25 marks)

SECTION D – 25 MARKS

ANSWER ONE QUESTION ONLY, showing supporting calculations where appropriate

Question Five

SY Ltd, a manufacturer of computer games, has developed a new game called the MANPAC. This is an interactive 3D game and is the first of its kind to be introduced to the market. SY Ltd is due to launch the MANPAC in time for the peak selling season.

Traditionally SY Ltd has priced its games based on standard manufacturing cost plus selling and administration cost plus a profit margin. However, the management team of SY Ltd has recently attended a computer games conference where everyone was talking about life cycle costing, target costing and market-based pricing approaches. The team has returned from the conference and would like more details on the topics they heard about and how they could have been applied to the MANPAC.

Required:

As management accountant of SY Ltd,

(a) discuss how the following techniques could have been applied to the MANPAC:

- life cycle costing,
- target costing;

(8 marks)

(b) evaluate the market-based pricing strategies that should have been considered for the launch of the MANPAC and recommend a strategy that should have been chosen;

(6 marks)

(c) explain each stage in the life cycle of the MANPAC and the issues that the management team will need to consider at each stage. Your answer should include a diagram to illustrate the product life cycle of the MANPAC.

(11 marks)

(Total = 25 marks)

Question Six

P Ltd has two divisions, Q and R, that operate as profit centres. Division Q has recently been set up to provide a component (Comp1) which division R uses to produce its product (ProdX). Prior to division Q being established, division R purchased the component on the external market at a price of £160 per unit. Division Q has an external market for Comp1 and also transfers to division R. Division R uses one unit of Comp1 to produce ProdX which is sold externally. There are no other products produced and sold by the divisions.

Costs associated with the production of Comp1 and ProdX are as follows:

	<i>Comp1</i>	<i>ProdX</i>
Fixed costs	£50,000 per annum	£100,000 per annum
Variable costs		£250 per unit *
Direct labour	£15 per hour	
Materials	£25 per unit	
Variable overheads	£3 per labour hour	

* The variable cost for ProdX excludes the cost of the component.

The first unit of Comp1 will take 20 labour hours to produce. However, it is known that the work of direct labour is subject to a 90% learning curve.

The forecasted external annual sales and capacity levels for the divisions are as follows:

External sales

Division Q	Comp1	5,000 units at a price of £150 per unit
Division R	ProdX	10,000 units at a price of £500 per unit

Production capacity

Division Q	Comp1	13,000 units
Division R	ProdX	15,000 units

Required:

- (a) State, with reasons, the volume of Comp1 which division Q would choose to produce in the first year and calculate the marginal cost per unit of Comp1 at this volume. (6 marks)
- (b) (i) Explain the criteria an effective system of transfer pricing should satisfy. (6 marks)
- (ii) Discuss one context in which a transfer price based on marginal cost would be appropriate and describe any issues that may arise from such a transfer pricing policy. (5 marks)
- (iii) Identify the minimum transfer price that division Q would wish to charge and the maximum transfer price which division R would want to pay for the Comp1. Discuss the implications for the divisions and for the group as a whole of the transfer prices that you have identified. (8 marks)
- (Total = 25 marks)

End of paper