

Intermediate Level

## Management Accounting – Performance Management

# 8

# IMPM

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.

Ensure that there is graph paper on your desk.

Answer the ONE question in section A (this has 10 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 are 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 IMPM 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 TEN SUB-QUESTIONS – 2 MARKS EACH

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Each of the sub-questions numbered from **1.1** to **1.10** 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 to the inside front cover of your answer book before you hand it to the invigilators at the end of the examination.***

#### Question One

**1.1** N plc is forecasting its power costs for Period 12 using the following past data values:

	<i>Number of machine hours</i>	<i>Cost £</i>
Period 8	4,260	8,944
Period 9	3,657	7,961
Period 10	4,689	9,643

If price levels are expected to remain unchanged in Period 12, the expected power cost of 4,500 machine hours is closest to

- A**    £7,309                      **B**    £7,334                      **C**    £9,309                      **D**    £9,334
- 

**1.2** A company is calculating the relevant cost of the material to be used on a particular contract.

The contract requires 4,200 kgs of material H and this can be bought for \$6.30 per kg.

The company bought 10,000 kgs of material H some time ago when it paid \$4.50 per kg. Currently 3,700 kgs of this remains in stock. The stock of material H could be sold for \$3.20 per kg.

The company has no other use for material H other than on this contract, but it could modify it at a cost of \$3.70 per kg and use it as a substitute for material J. Material J is regularly used by the company and can be bought for \$7.50 per kg.

The relevant cost of the material for the contract is

- A**    \$17,210                      **B**    \$19,800                      **C**    \$26,460                      **D**    \$30,900
-

**1.3** Which of the following statements are correct?

- (i) A fixed budget is a budget that considers all of an organisation's costs and revenues for a single level of activity.
- (ii) A flexible budget is a budget that is produced during the budget period to recognise the effects of any changes in prices and methods of operation that have occurred.
- (iii) Organisations can use budgets to communicate objectives to their managers.

- A** (i) and (ii) only
  - B** (i) and (iii) only
  - C** (ii) and (iii) only
  - D** All of them
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*The following data are to be used to answer questions 1.4 and 1.5 below*

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H plc is forecasting its sales for next year using a combination of time series and regression analysis models. An analysis of past sales units has produced the following equation for the quarterly sales trend:

$$y = 26x + 8,850$$

where the value of  $x$  represents the quarterly accounting period and the value of  $y$  represents the quarterly sales trend in units. Quarter 1 of next year will have a value for  $x$  of 25.

The quarterly seasonal variations have been measured using the multiplicative (proportional) model and are:

Quarter 1	- 15%
Quarter 2	- 5%
Quarter 3	+ 5%
Quarter 4	+ 15%

Production is planned to occur at a constant rate throughout the year.

The company does not hold stocks at the end of any year.

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**1.4** The difference between the budgeted sales for quarter 1 and quarter 4 next year are

- A** 78 units.
  - B** 2,850 units.
  - C** 2,862 units.
  - D** 2,940 units.
- 

**1.5** The number of units to be produced in each quarter of next year will be nearest to

- A** 9,454 units.
  - B** 9,493 units.
  - C** 9,532 units.
  - D** 9,543 units.
-

- 1.6** S plc, a food processing company, uses the First In First Out method when costing its monthly output. The following details relate to October 2003:

Opening work in process	10,000 kgs	90% complete as to raw ingredients and 40% converted
Raw ingredients added	34,880 kgs	
Output	30,500 kgs	
Normal loss		15% of raw ingredients added in the period
Closing work in process	9,700 kgs	85% complete as to raw ingredients and 35% converted

The number of equivalent kgs that would be used when calculating the cost per kg in relation to raw ingredients and conversion costs for October 2003 would be nearest to

	<i>Raw ingredients</i>	<i>Conversion</i>
<b>A</b>	38,200	27,300
<b>B</b>	29,200	29,300
<b>C</b>	29,700	29,900
<b>D</b>	30,300	30,300

*The following data are to be used to answer questions 1.7, 1.8, 1.9 and 1.10 on the opposite page*

T plc manufactures a component D12, and two main products F45 and P67. The following details relate to each of these items:

	<i>D12</i>	<i>F45</i>	<i>P67</i>
	<i>\$ per unit</i>	<i>\$ per unit</i>	<i>\$ per unit</i>
Selling price	<u>—</u>	<u>146·00</u>	<u>159·00</u>
Material cost	10·00	15·00	26·00
Component D12 (bought-in price)		25·00	25·00
Direct labour	5·00	10·00	15·00
Variable overhead	<u>6·00</u>	<u>12·00</u>	<u>18·00</u>
Total variable cost per unit	<u>21·00</u>	<u>62·00</u>	<u>84·00</u>
Fixed overhead costs	<i>\$ per annum</i>	<i>\$ per annum</i>	<i>\$ per annum</i>
Avoidable*	9,000	18,000	40,000
Non-avoidable	<u>36,000</u>	<u>72,000</u>	<u>160,000</u>
Total	<u>45,000</u>	<u>90,000</u>	<u>200,000</u>

- \* The avoidable fixed costs are product specific fixed costs that would be avoided if the product or component were to be discontinued.

**1.7** Assuming that the annual demand for component D12 is 5,000 units and that T plc has sufficient capacity to make the component itself, the maximum price that should be paid to an external supplier for 5,000 components per year is

- A** \$105,000      **B** \$114,000      **C** \$141,000      **D** \$150,000
- 

**1.8** Assuming that component D12 is bought from an external supplier for \$25.00 per unit, the number of units of product F45 that must be sold to cover its own costs without contributing to T plc's non-avoidable fixed costs is closest to

- A** 188 units.      **B** 214 units.      **C** 228 units.      **D** 261 units.
- 

**1.9** Assuming that component D12 is bought from an external supplier for \$25.00 per unit and assuming that units of products F45 and P67 are to be sold in the ratio of 4:3 respectively, the breakeven sales value (to the nearest \$000) is

- A** \$506,000      **B** \$549,000      **C** \$616,000      **D** \$624,000
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**1.10** Assume that component D12 is bought from an external supplier for \$25.00 per unit and assume that production and sales of products F45 and P67 are as follows:

	<i>F45</i>	<i>P67</i>
Production (units)	3,000	2,500
Sales (units)	2,500	2,000

The profit to be reported under marginal costing is closest to

- A** \$34,000      **B** \$70,000      **C** \$113,500      **D** \$171,500
- 

*(Total = 20 marks)*

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## SECTION B – 30 MARKS

ANSWER THIS QUESTION, showing supporting calculations where appropriate

### Question Two

M plc uses a standard absorption costing system based on ideal standards, and values its stocks of raw materials and finished products at standard cost.

M plc produces and sells two products. The standard cost and standard selling price details are as follows:

	<i>Product X</i>	<i>Product Y</i>
	<i>\$ per unit</i>	<i>\$ per unit</i>
Direct material (\$5 per kg)	62.50	27.50
Direct labour (\$8 per hour)	24.00	40.00
Fixed production overhead *	<u>36.00</u>	<u>60.00</u>
Total production cost	122.50	127.50
Standard profit	<u>30.90</u>	<u>33.50</u>
Standard selling price	<u>153.40</u>	<u>161.00</u>

\*absorption rate based on standard labour hours.

Budgeted and actual production and sales units for October 2003 were as follows:

	<i>Budget</i>		<i>Actual</i>	
	<i>Product X</i>	<i>Product Y</i>	<i>Product X</i>	<i>Product Y</i>
Production	8,500	11,500	9,000	9,500
Sales	7,600	11,000	8,300	9,000

The budgeted output and the budgeted fixed production overhead costs for October were both expected to be one-twelfth of their annual totals.

Actual data for October were as follows:

		\$
Direct material purchases	180,000 kgs costing	1,150,400
Direct materials used	174,500 kgs	
Direct labour hours	82,500 hours costing	690,320
Fixed production overhead		1,200,780
Sales revenues:		
Product X		1,260,000
Product Y		1,430,000

An analysis of the direct labour hours shows that of the 82,500 hours that were paid for, 2,670 were idle time due to a machinery breakdown.

There were no stocks of direct materials or finished products (planned or actual) at the start of October.

***Required:***

(a) Calculate the budgeted profit / loss for October.

*(2 marks)*

(b) Calculate the actual profit / loss for October.

*(4 marks)*

(c) The Management Accountant has started to reconcile the budgeted and actual profits and has already calculated the following variances:

Direct material price variance	\$250,400 Adverse
Direct material usage variance	\$48,750 Adverse
Direct labour rate variance	\$30,320 Adverse

***Required:***

Prepare a statement that reconciles the budgeted and actual profit / loss for October, showing the variances in as much detail as possible from the information provided.

*(19 marks)*

(d) Explain and briefly discuss the level of efficiency assumed in M plc's standard costing system, and suggest an alternative level that may be more useful for operational control.

*(5 marks)*

*(Total = 30 marks)*

## SECTION C – 25 MARKS

ANSWER ONE QUESTION ONLY [EITHER question three OR question four, BUT NOT BOTH], showing supporting calculations where appropriate

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### Question Three

W plc provides two cleaning services for staff uniforms to hotels and similar businesses. One of the services is a laundry service and the other is a dry cleaning service. Both of the services use the same resources, but in different quantities. Details of the expected resource requirements, revenues and costs of each service are shown below:

		<i>Laundry</i> \$ per service	<i>Dry cleaning</i> \$ per service
Selling price		7.00	12.00
Cleaning materials	(\$10.00 per litre)	2.00	3.00
Direct labour	(\$6.00 per hour)	1.20	2.00
Variable machine cost	(\$3.00 per hour)	0.50	1.50
Fixed costs *		<u>1.15</u>	<u>2.25</u>
Profit		<u>2.15</u>	<u>3.25</u>

\* The fixed costs per service were based on meeting the budget demand for December 2003.

W plc has already prepared its budget for December based on sales and operational activities of 8,000 laundry services and 10,500 dry cleaning services, but it is now revising its plans because of forecast resource problems.

The maximum resources expected to be available in December 2003 are:

Cleaning materials	5,000 litres
Direct labour hours	6,000 hours
Machine hours	5,000 hours

W plc has one particular contract which it entered into six months ago with a local hotel to guarantee 1,200 laundry services and 2,000 dry cleaning services every month. If W plc does not honour this contract it has to pay substantial financial penalties to the local hotel.

### *Required:*

- (a) Calculate the mix of services that should be provided by W plc so as to maximise its profit for December 2003.

(9 marks)



- (b) The Sales Director has reviewed the selling prices being used by W plc and has provided the following further information:
- if the price for laundry were to be reduced to \$5.60 per service, this would increase the demand to 14,000 services;
  - if the price for dry cleaning were to be increased to \$13.20 per service, this would reduce the demand to 9,975 services.

***Required:***

Assuming that such selling price changes would apply to **all sales** and that the resource limitations continue to apply, and that a graphical linear programming solution is to be used to maximise profit,

- (i) state the constraints and objective function; (6 marks)

- (ii) use a graphical linear programming solution to advise W plc whether it should revise its selling prices. (10 marks)

(Total = 25 marks)

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#### Question Four

R plc is an engineering company that repairs machinery and manufactures replacement parts for machinery used in the building industry. There are a number of different departments in the company including a foundry, a grinding department, a milling department and a general machining department. R plc prepared its budget for the year ending 31 December 2003 using an incremental budgeting system.

The budget is set centrally and is then communicated to each of the managers who have responsibility for achieving their respective targets. The following report has been produced for the general machining department for October 2003:

	<i>Budget</i>	<i>Actual</i>	<i>Variance</i>
Number of machine hours	9,000	11,320	2,320 (F)
	\$	\$	\$
Cleaning materials	1,350	1,740	390 (A)
Steel	45,000	56,000	11,000 (A)
Other direct materials	450	700	250 (A)
Direct labour	29,000	32,400	3,400 (A)
Production overheads	<u>30,000</u>	<u>42,600</u>	<u>12,600</u> (A)
Total	<u>105,800</u>	<u>133,440</u>	<u>27,640</u> (A)

The Manager of the general machining department has received a memo from the Financial Controller requiring him to explain the serious overspending within his department.

The Manager has sought your help and, after some discussion, you have ascertained the following:

- the cleaning materials, steel and other direct materials vary in proportion to the number of machine hours;
- the budgeted direct labour costs include fixed salary costs of \$4,250, the balance is variable in proportion to the number of machine hours;
- the production overhead costs include a variable cost that is constant per machine hour at all activity levels, and a stepped fixed cost which changes when the activity level exceeds 10,000 machine hours. A further analysis of this cost is shown below:

Activity (machine hours)	3,000	7,000	14,000
Costs (\$)	13,500	24,500	45,800

***Required:***

- (a) Prepare a revised budgetary control statement using the additional information that you have obtained from the Manager of the general machining department. (10 marks)
- (b) (i) Explain the differences between an incremental budgeting system and a zero based budgeting system. (4 marks)
- (ii) Explain why R plc and similar organisations would find it difficult to introduce a system of zero based budgeting. (4 marks)
- (c) Explain the benefits of involving the managers of R plc in the budget setting process, rather than setting the budget centrally as is R plc's current policy. (7 marks)
- (Total = 25 marks)
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## SECTION D – 25 MARKS

ANSWER ONE QUESTION ONLY [EITHER question five OR question six, BUT NOT BOTH]

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### Question Five

SY Limited is a restaurant that specialises in freshly-cooked meals, using ingredients that are obtained from a number of different suppliers.

SY Limited uses an absorption costing system based on the number of meals to identify the total cost of each of its meals. It uses these costs as the basis of setting selling prices and measuring the profitability of each meal.

The Managing Director of SY Limited has recently returned from a conference which discussed a number of issues connected with the catering industry. She overheard some of the delegates discussing how the profitability of their businesses had increased dramatically after they introduced an activity based costing (ABC) system.

#### *Required:*

- (a) Use a simple numerical example to illustrate the differences in the total cost of each meal that may arise if SY Limited were to use an ABC system (using THREE activities) instead of its present absorption costing system.

(15 marks)

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- (b) SY Limited is also considering the use of marginal costing rather than its present system.

#### *Required:*

- (i) Explain the cost behaviour issues that SY Limited would need to consider if it wished to introduce a marginal costing system.

(6 marks)

- (ii) Briefly discuss the benefits that might be derived from introducing a marginal costing system at the restaurant.

(4 marks)

(Total = 25 marks)

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### Question Six

E plc provides a computer upgrading, servicing and repair facility to a variety of business and personal computer users.

The management team has managed the business to date by using a standard costing and budgetary control system. However, the team has recently been discussing the possible use of alternative performance measurement systems, such as the "Balanced Scorecard".

#### *Required:*

- (a) Explain the concept of the Balanced Scorecard and how it may be used by E plc to improve performance measurement.

(10 marks)

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- (b) Another issue which concerns the management of E plc is the quality of the service provided for clients. The Operations Manager has suggested that the company should introduce Total Quality Management (TQM) but the management team is unsure how to do this and of the likely costs and benefits of its introduction.

#### *Required:*

- (i) Briefly explain Total Quality Management in the context of E plc.

(3 marks)

- (ii) Discuss the likely costs and benefits that would arise if E plc introduced a TQM policy.

(12 marks)

(Total = 25 marks)

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*End of paper*