Summer Examinations 2015

ACC200315N

Module Title: Management Accounting
Level: Five
Time Allowed: Three hours, plus fifteen minutes reading time. Students must not commence answering the questions until the reading time has ended.

Instructions to students:
- Enter your student number not your name on all answer books.
- During the 15 minutes reading time, students are permitted to make notes on the examination paper but not on the answer book. Students should begin answering the questions after the reading time has ended.
- Answer all questions from Section A and three questions from Section B.
- Neither books nor notes may be taken into the examination.
- The use of a non-programmable calculator is permitted.
- A Formulae Sheet is provided on page 10 of the examination paper.
- Graph paper will be provided.

<table>
<thead>
<tr>
<th>No. of Pages</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Questions</td>
<td>6</td>
</tr>
</tbody>
</table>
Section A

Question 1

a. Lionheart Ltd produces a home security alarm system. The budgeted selling price and costs are as follows:

<table>
<thead>
<tr>
<th></th>
<th>£ per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>1025</td>
</tr>
<tr>
<td>Prime costs</td>
<td>600</td>
</tr>
<tr>
<td>Variable overheads</td>
<td>50</td>
</tr>
</tbody>
</table>

Fixed costs (under current production range): £500,000 per month

Budgeted production: 12,000 units per month

Required:

i. Calculate the breakeven point for Lionheart Ltd in both units and sales value. (3 marks)

ii. Calculate the margin of safety for Lionheart based on the latest budget, in units, sales value and as a percentage. (3 marks)

iii. Later in the year Lionheart learns that the fixed costs will increase by 20%. Calculate the revised breakeven point and margin of safety. (3 marks)
b. Ali is a bespoke carpenter. He knows he has a learning curve effect of 80% - each time he doubles his cabinet production for a particular customer.

This has a significant effect on his costs and it is one reason why he always suggests that a client buy a pair of cabinets rather than order just one. He is trying to calculate the level of discount that he would be able to offer for the second cabinet.

Ali’s costs are:

- Wood: £78
- Other materials: £10
- Variable overhead: £12
- Labour cost for the first cabinet: £60
- Time taken to make the first cabinet: 2 hours
- Fixed overheads are charged at 250% of labour costs

Selling price is arrived at by applying a 150% mark-up on total cost.

**Required:**

1. Calculate the selling price of one cabinet and the selling price of a pair of cabinets along with the % discount that would be effectively offered on the second cabinet. (6 marks)

2. Calculate the selling price of a special order of 8 cabinets that Ali has just received from a local nursing home. (2 marks)

3. Calculate the amount of labour hours it would take Ali to make the 6th cabinet of this special order. (2 marks)

c. There is some debate as to whether environmental costs can be accurately measured.

**Required:**

1. Discuss how the Balanced Scorecard might be adapted to measure the environmental impact of an organisation. (6 marks)

(Total: 25 marks)
SECTION B

Answer three questions from this section.

Question 2

Abacus Ltd makes two types of calculator, the Scientific and the Financial. The Scientific is the most popular product and is sold in large numbers to schools. The Financial is a more specialised product which is sold in smaller numbers to Investment Analyst firms.

Budgeted details for the two types of calculator are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Scientific</th>
<th>Financial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual sales</td>
<td>30,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Average order size</td>
<td>30</td>
<td>2</td>
</tr>
<tr>
<td>Direct Materials per unit</td>
<td>£3</td>
<td>£5</td>
</tr>
<tr>
<td>Direct rate per hour</td>
<td>£15</td>
<td>£15</td>
</tr>
<tr>
<td>Special components per unit</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Production batch size</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>Set ups per batch</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Labour hours</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Overheads</strong></td>
<td><strong>£</strong></td>
<td><strong>Cost Driver</strong></td>
</tr>
<tr>
<td>Material handling costs</td>
<td>4,000</td>
<td>Number of batches</td>
</tr>
<tr>
<td>Set up costs</td>
<td>3 600</td>
<td>Number of set ups</td>
</tr>
<tr>
<td>Special component handling</td>
<td>17 000</td>
<td>No. of special comp</td>
</tr>
<tr>
<td>Other overheads</td>
<td>12 800</td>
<td>Labour hours</td>
</tr>
</tbody>
</table>
Required:

a. Calculate the cost per unit of the Scientific and the Financial based on Activity Based Costing techniques.  
   \[(12 \text{ marks})\]

b. Calculate the cost per unit of the Scientific and the Financial based on traditional Absorption Costing techniques.  
   \[(4 \text{ marks})\]

c. Explain why the overhead costs calculated in a. and b. above vary so significantly and what might be the possible consequences of not adopting an Activity Based Costing system.  
   \[(5 \text{ marks})\]

d. What type of industries would most benefit from the adoption of ABC and for which type of industry would Absorption Costing still be appropriate?  
   \[(4 \text{ marks})\]

(Total: 25 marks)
Question 3

Broughton Ltd produces a household cleaning product called Ms Sparkle. In order to produce a standard batch of 160 litres of the cleaning solution, three different raw materials are input into the process in the following proportions:

<table>
<thead>
<tr>
<th>Litres of Material</th>
<th>@ Price per Litre</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>70 litres of X</td>
<td>£1 per litre</td>
<td>70</td>
</tr>
<tr>
<td>90 litres of Y</td>
<td>£3 per litre</td>
<td>270</td>
</tr>
<tr>
<td>40 litres of Z</td>
<td>£2 per litre</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>420</td>
</tr>
</tbody>
</table>

Due to high levels of evaporation, a standard loss of 20% of input is expected to occur.

The actual input for the month of April was:

<table>
<thead>
<tr>
<th>(£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>36,000 litres of X @ £0.80 per litre</td>
</tr>
<tr>
<td>48,000 litres of Y @ £3.30 per litre</td>
</tr>
<tr>
<td>16,000 litres of Z @ £2.20 per litre</td>
</tr>
<tr>
<td>100,000</td>
</tr>
</tbody>
</table>

The actual output for the period was 89,000 litres of cleaning solution.

Required:

a. Calculate the material price variance for material X, Y and Z. (3 marks)

b. Calculate the materials mix variance for the process. (8 marks)

c. Calculate the materials yield variance of the resultant cleaning solution. (4 marks)

d. Explain why the variances you have calculated in parts a. to c. might have occurred, suggesting possible causes for the deviation from standard. (5 marks)

e. Identify and describe the purpose of a standard costing system. (5 marks)

(Total: 25 marks)
Question 4

Planet Limited, based in Newcastle, makes four products A, B, C and D. Details of sales prices, costs and resource requirements for each of the products are as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>£1.80</td>
<td>£0.80</td>
<td>£1.40</td>
<td>£2.60</td>
</tr>
<tr>
<td>Materials cost</td>
<td>£0.50</td>
<td>£0.20</td>
<td>£0.60</td>
<td>£0.40</td>
</tr>
<tr>
<td>Direct labour cost</td>
<td>£0.40</td>
<td>£0.20</td>
<td>£0.40</td>
<td>£1.00</td>
</tr>
<tr>
<td>(Time required)</td>
<td>Minutes</td>
<td>Minutes</td>
<td>Minutes</td>
<td>Minutes</td>
</tr>
<tr>
<td>Machine time per unit</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Labour time per unit</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Weekly sales demand</td>
<td>Units</td>
<td>Units</td>
<td>Units</td>
<td>Units</td>
</tr>
<tr>
<td></td>
<td>5,000</td>
<td>4,500</td>
<td>6,500</td>
<td>3,500</td>
</tr>
</tbody>
</table>

Labour time is a bottleneck resource and the maximum capacity operates at 640 labour hours each week. Operating costs, including direct labour costs are £15,440 each week. Direct labour costs are £12 per hour, and direct labour workers are paid for a 38-hour week, with no overtime.

Required:

a. Determine the quantities of each product that should be made and sold each week to maximise profit and calculate the weekly profit. (16 marks)

b. Calculate the throughput accounting ratio at this profit maximising level of output and sales. (4 marks)

c. Interpret the result of the ratio in b. above. (2 marks)

d. State two shortcomings or criticisms of the throughput accounting ratio in practice. (3 marks)

(Total: 25 marks)
Question 5

La Fiesta AG, a limited company in Spain, produces forest tents and camping sets. Each product passes through a cutting process and an assembly process.

One forest tent, which makes a contribution of €60, takes four hours of cutting time and three hours of assembly time.

One camping set which makes a contribution of €110, takes six hours of cutting time and nine hours of assembly time.

There is a maximum of 48 cutting hours available each week and 54 assembly hours.

Cutters are paid €10 per hour and assembly workers €12 per hour.

Required:

a. Formulate the linear programming problem of La Fiesta AG, identifying the constraints and the objective function. (3 marks)

b. Plot the constraints on a suitable graph and indicate the feasible region. (7 marks)

c. Determine the optimum production plan, using simultaneous equations to verify the optimal point. (4 marks)

d. Calculate the total contribution at this optimum point. (2 marks)

e. Explain the term "shadow price". Calculate the shadow price of the cutting time. (4 marks)

f. La Fiesta AG is unhappy with the level of profit being earned on its two products and is considering the introduction of target costing. Explain how target costing operates. (5 marks)

(Total: 25 marks)
Question 6

Most Japanese companies that have used just-in-time (JIT) for five or more years are reporting close to a 30 per cent increase in labour productivity, a 60 per cent reduction in inventories, a 90 per cent reduction in quality rejection rates, and a 15 per cent reduction in necessary plant space.

However, implementing a just-in-time (JIT) system does not occur overnight. It took Toyota over twenty years to develop its system and realise significant benefits from it. (Source: Sumer C. Aggrawal, Harvard Business Review)

Required:

a. Explain how the benefits claimed for JIT in the above quotation are achieved and why it takes so long to achieve those benefits. (15 marks)

b. Explain how management information systems in general (and management accounting systems in particular) should be developed in order to facilitate and make best use of JIT. (10 marks)

(Total: 25 marks)

End of Section B
Formulae Sheet Follows Overleaf
Formulae Sheet:

i) For a straight line with equation \( y = a + bx \):

- \( a \) is the intercept with the y-axis
- \( b \) is the gradient or slope

Formulae for a sample size, \( n \), the constants \( a \) and \( b \) can be found using:

\[
a = \frac{(\Sigma y - b(\Sigma x))/n}{b = \frac{n\Sigma xy - \Sigma x\Sigma y/[n\Sigma x^2 - (\Sigma x)^2]}{n}
\]

ii) The learning curve effect formula is:

\[
y = ax^b\quad \text{where:}
\]

\( y \) = cumulative average time (or average cost) per unit or per batch
\( a \) = time (or cost) for first unit or batch
\( b = \log r / \log 2 \quad (r = \text{rate of learning, expressed as a decimal})\)
\( x \) = cumulative output in units or in batches

End of Formulae Sheet
End of Paper