

**Economics**  
**Higher level**  
**Paper 3**

Tuesday 3 May 2016 (afternoon)

Candidate session number

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1 hour

**Instructions to candidates**

- Write your session number in the boxes above.
- You are permitted access to a calculator for this paper.
- Do not open this examination paper until instructed to do so.
- Answer two questions in the boxes provided.
- Unless otherwise stated in the question, all numerical answers must be given exactly or correct to two decimal places.
- You must show all your working.
- The maximum mark for this examination paper is **[50 marks]**.



Answer **two** questions. Each question is worth **[25 marks]**. Write your answers in the boxes provided.

1. In Ruritania, the demand for butter is given by the function

$$Q_d = 420 - 19P$$

where  $Q_d$  is the quantity of butter demanded per year, in millions of kilogrammes (kg), and  $P$  is the price of butter in dollars (\$) per kg.

(a) Calculate the quantity of butter demanded per year when price per kg is:

(i) \$7;

[1]

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(ii) \$10.

[1]

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(b) (i) Calculate the price elasticity of demand when price increases from \$7 to \$10.

[2]

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**(Question 1 continued)**

- (ii) Explain why, for a linear demand curve, the price elasticity of demand is not represented by the slope of the **demand curve**.

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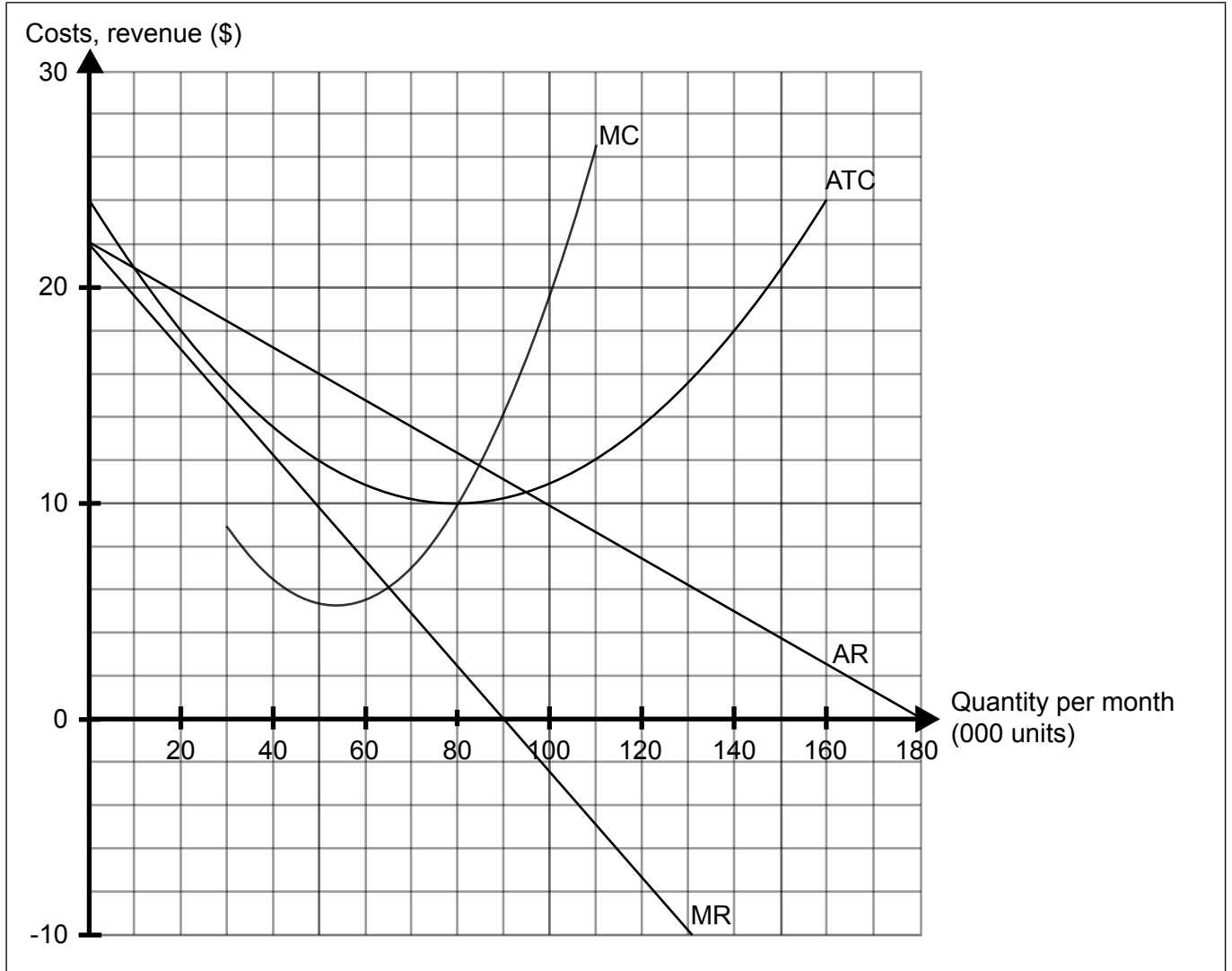
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**(Question 1 continued)**

The following diagram illustrates the average total cost (ATC), marginal cost (MC), average revenue (AR) and marginal revenue (MR) curves for a cartel which acts as a monopoly in order to maximize joint profits.



- (c) (i) If fixed costs are \$800 000 per month, calculate the total variable costs at a monthly output of 140 000 units.

[2]

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**(Question 1 continued)**

(ii) Outline the difference between the explicit and implicit costs of production. [2]

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(iii) Define the term *normal profit*. [2]

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(d) (i) Calculate the economic profit made by the cartel if the members jointly supply 50 000 units per month. [2]

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(ii) Identify the level of output which would maximize revenue for the cartel. [1]

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**(Question 1 continued)**

- (iii) Calculate the value of total revenue per month for members of the cartel if they produce at the revenue maximizing level of output. [2]

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- (e) Outline the reason why, even if a cartel achieves its objective of jointly maximizing profit, there will be an incentive for members of the cartel to cheat. [2]

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- (f) Explain **two** conditions, apart from the incentive for members to cheat, which make cartel structures difficult to maintain. [4]

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- 2. The currency of Botswana is the Botswana pula (BWP). The annual demand for the BWP is given by the function

$$Q_d = 4611 - 100P$$

while the annual supply is given by the function

$$Q_s = 4578 + 200P$$

where P is the United States dollar price of the BWP (US\$/BWP), Q<sub>d</sub> is the annual quantity demanded and Q<sub>s</sub> is the annual quantity supplied in millions of units of BWP. The value of the BWP is determined in a freely floating exchange rate system.

- (a) Define the term *freely floating exchange rate system*. [2]

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- (b) Calculate the equilibrium exchange rate for the Botswana pula (BWP). [2]

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**(Question 2 continued)**

(c) Following a rise in domestic interest rates in Botswana, the value of the BWP rises to US\$0.14.

(i) State the term used to describe the change in Botswana's exchange rate. [1]

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(ii) Outline **one** reason why the increase in domestic interest rates in Botswana may have caused the value of the BWP to increase. [2]

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(iii) State the term that would describe the change if the BWP was determined in a fixed exchange rate system. [1]

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Diamonds are a major export of Botswana, representing approximately 75% of export revenues. The demand for diamonds is considered highly income elastic.

(d) (i) Define the term *income elastic*. [2]

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**(Question 2 continued)**

- (ii) Explain, using an appropriate diagram, how faster economic growth in the US and the European Union (EU) may affect the value of the BWP. [4]

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**(Question 2 continued)**

The following table shows Botswana’s terms of trade between 2007 and 2010 as an index number (base year: 2000).

| 2007  | 2008  | 2009  | 2010  |
|-------|-------|-------|-------|
| 98.61 | 80.57 | 81.27 | 84.57 |

[Source: adapted from www.afdb.org (2012) and www.theglobaleconomy.com (2014)]

- (e) (i) State the formula used to measure the terms of trade. [1]

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- (ii) Outline the meaning of the “terms of trade”. [2]

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- (f) (i) Calculate the percentage change in Botswana’s terms of trade between 2007 and 2008 **and** between 2008 and 2010. [2]

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**(Question 2 continued)**

- (ii) Using appropriate terms, describe the changes in Botswana's terms of trade between 2007 and 2008 **and** between 2008 and 2010.

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- (g) Assume now that Botswana's currency depreciates. Explain how this may impact on the country's current account balance.

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- 3. The following information provides a simplified version of the calculation of a consumer price index (CPI).

In Country A, the rate of inflation is measured by the calculation of a CPI. The index is calculated using the five products which are purchased by citizens of Country A as representative of a "typical basket of goods".

The weighting given to each product is based on the quantities of each product purchased by the average household in Country A per week.

**Table 1**

| Product | Average price per unit in dollars (\$) |      | Quantity of each product purchased by the average household per week |
|---------|--|------|--|
|         | 2015                                   | 2016 |  |
| A       | 5.60                                   | 6.30 | 25   |
| B       | 3.45                                   | 3.50 | 18   |
| C       | 1.20                                   | 1.05 | 40   |
| D       | 8.40                                   | 9.20 | 5  |
| E       | 2.55                                   | 2.35 | 12   |

Assume that 2015 is the base year for the purpose of calculating the CPI.

- (a) Calculate the consumer price index (CPI) for Country A in 2016. [3]

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- (b) State **two** reasons why the CPI may not accurately reflect changes in the cost of living for citizens of Country A. [2]

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**(Question 3 continued)**

In Country B, the values of the CPI between 2008 and 2012 are given in the following table.

**Table 2**

| Year | CPI |
|------|-----|
| 2008 | 98  |
| 2009 | 97  |
| 2010 | 100 |
| 2011 | 110 |
| 2012 | 115 |

- (c) (i) Using the data in **Table 2** to support your answer, identify **one** year in which Country B experienced deflation **and one** year in which Country B experienced disinflation.

[2]

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- (ii) In Country B, nominal per capita GDP is \$800 per month in 2010 and \$940 per month in 2012. Using the CPI in **Table 2** as a deflator, calculate the percentage change in real per capita GDP from 2010 to 2012.

[2]

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**(Question 3 continued)**

- (d) Using an AD/AS diagram, explain **one** reason why deflation may lead to a higher level of unemployment.

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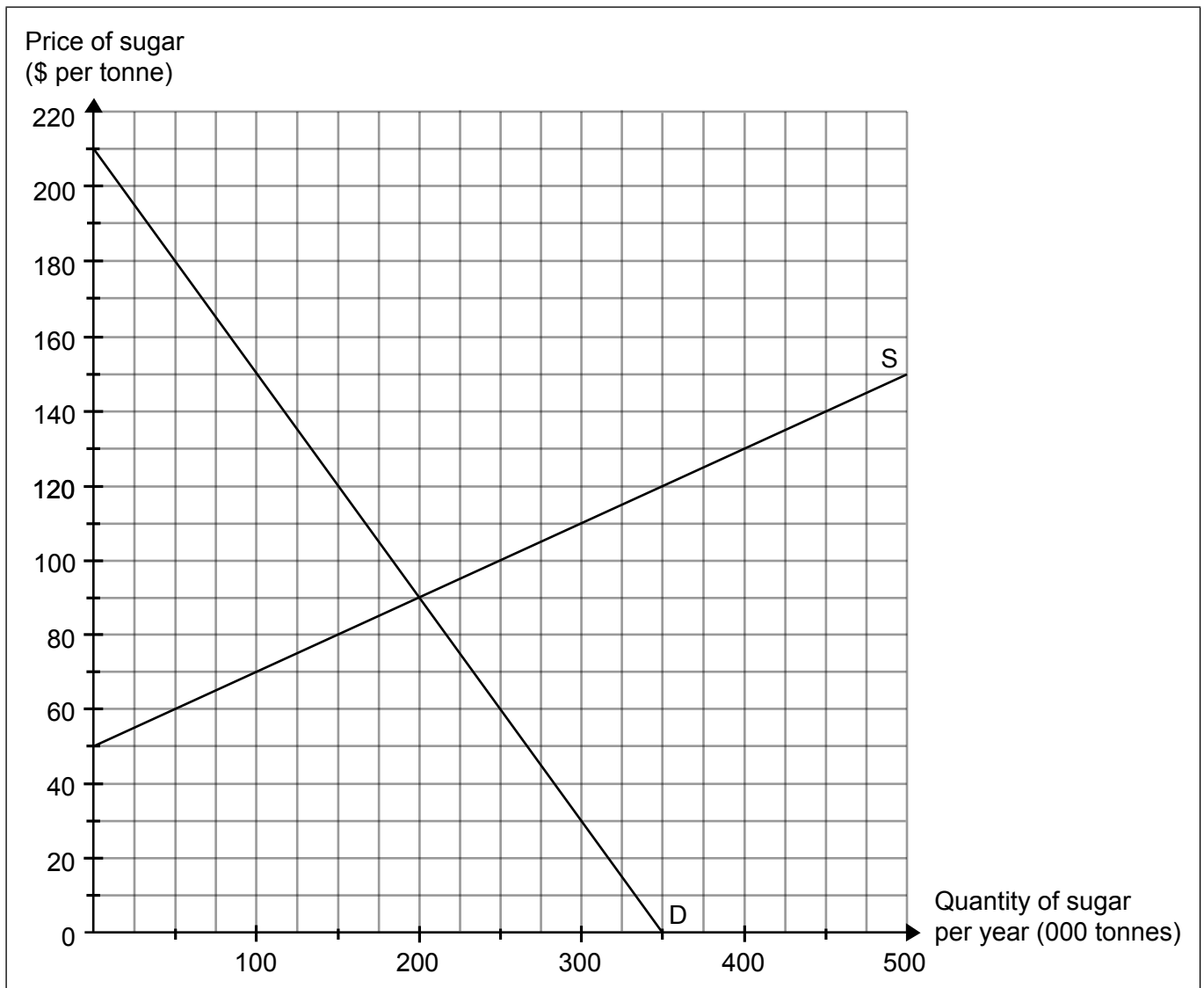
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**(Question 3 continued)**

The following diagram illustrates the annual demand and supply for sugar in Country C.



In order to reduce the consumption of sugar, the government of Country C has decided to impose an indirect tax. As a result, the new market supply curve for sugar is given by the function

$$Q_s = -450 + 5P$$

where  $Q_s$  is the quantity of sugar supplied, in thousands of tonnes per year, and  $P$  is the price of sugar in dollars (\$) per tonne.

- (e) (i) On the diagram, plot and label the new supply curve for sugar. [2]

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**(Question 3 continued)**

(ii) State the size of the tax per tonne of sugar. [1]

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(iii) Calculate the producer surplus which will be earned following the imposition of the tax. [2]

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(iv) Determine the incidence of the tax per tonne on producers of sugar in Country C. [1]

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**(Question 3 continued)**

- (f) (i) With reference to the distribution of income, distinguish between equity and equality. [2]

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- (ii) Explain, using an appropriate example, why it might be argued that an indirect tax is not equitable. [4]

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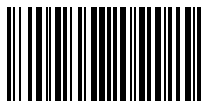
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