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# MARKSCHEME

# May 2014

# ECONOMICS

# Higher Level

# Paper 3

*Notes for examiners:*

1. *Whenever relevant, carry over marks must be awarded. If a candidate makes an error in calculation, but then uses the incorrect figure appropriately and accurately in later question parts, then the candidate may be fully rewarded. This is the "own-figure rule" and you should put OFR on the script where you are rewarding this. Please note that OFR is now available as an annotation stamp.*

2. *Alternative approaches may be taken in responses to the [4 mark] questions that use A02 command terms. If this is the case and the alternative approaches are valid, then full credit should be given.*

1.  (a)  **Calculate the gross domestic product (GDP) for Country Z in 2012.**          *[2]*

$$6520+1020+3300+(2295-2450)$$          *[1]*

*Any valid working is sufficient for [1].*

$10\,685\,000\,000$          *[1]*

*An answer of $10 685 million or $10.69 billion (or $10.685 billion) without workings is sufficient for [1].*

(b)  **The population of country Z is 420 000. Calculate per capita GDP for Country Z in 2012.**          *[2]*

$$\frac{10\,685\,000\,000}{420\,000}$$          *[1]*

*Any valid working is sufficient for [1].*

$=\$25\,440.48$ or $25\,440$          *[1]*

*An answer of 25 440 without workings is sufficient for [1].*

OFR applies

*N.B.* A response which gives the answer to the nearest $ should be accepted as this is standard practice for publication of national income statistics.

**(c)** **Countries may calculate GDP using the output approach, the income approach or the expenditure approach. Outline the difference between the expenditure approach and the income approach.** *[2]*

| Level | | Marks |
|---|---|---|
| 0 | *The work does not reach a standard described by the descriptors below.* | **0** |
| 1 | *There is limited understanding.*<br>For a response which is accurate but is limited to one of the two approaches. **OR** which refers to both approaches in a vague fashion (*eg* "in the expenditure approach, total spending is calculated"). | **1** |
| 2 | *There is clear understanding.*<br>For a clear understanding that in the expenditure approach, total spending on domestic output is summed, whereas in the income approach, incomes earned in the production of domestic output are summed. | **2** |

A response which states accurately the components of each approach should be fully rewarded *ie*

$$\text{expenditure approach} = C + I + G + (X - M)$$

income approach = wages + profits + interest + rent.

However, it is not necessary to state these components in order to earn full marks.

**(d)** **Economists have suggested that it is important to calculate "green GDP". Outline the meaning of the term "green GDP".** *[2]*

| Level | | Marks |
|---|---|---|
| 0 | *The work does not reach a standard described by the descriptors below.* | **0** |
| 1 | *There is limited understanding.*<br>For a response which conveys the idea that the term relates to effects on the environment. | **1** |
| 2 | *There is clear understanding.*<br>For a response which explains that green GDP is GDP adjusted for the effects of production on the environment. | **2** |

**(e)**   **In Country Z, for each additional \$1 of income earned, 4 cents (\$0.04) is saved, 15 cents (\$0.15) is taken as tax and 6 cents (\$0.06) is spent on imported goods and services.  Calculate the value of the multiplier in Country Z.**   *[2]*

$$\text{Multiplier} = \frac{1}{0.04 + 0.15 + 0.06}$$   *[1]*

*Any valid working is sufficient for [1].*

$= 4$   *[1]*

*An answer of 4 without workings is sufficient for [1].*

If a candidate states $= \dfrac{1}{0.25}$

$= 4$

this should be fully rewarded.

**(f)   (i)   The government of Country Z intends to increase government spending in order to increase GDP by \$950 million.  Using your answer to (e), calculate the increase in government spending needed to bring about the desired change in GDP.**   *[2]*

$$\Delta G = \frac{950}{4}$$   *[1]*

*Any valid working is sufficient for [1].*

$= \$237\,500\,000$   *[1]*

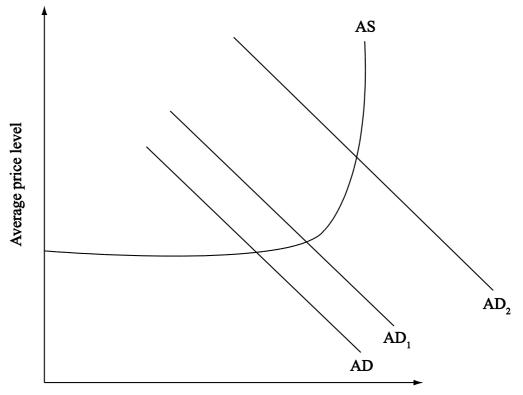*An answer of 237.5 million (or 237 500 000) without workings is sufficient for [1].*

OFR applies

**(ii)   Sketch an AD/AS diagram to show the impact of the multiplier.**          *[3]*



For an AD/AS diagram (with correct labelling).                                    *[1]*
For an AD/AS diagram showing a shift in AD.                                       *[2]*
For an AD/AS diagram showing a shift in AD and a second, larger shift in
AD in the same direction.                                                        *[3]*

Candidates who incorrectly label the diagram, or who do not include an AS
curve, can be rewarded with a maximum of *[2]*.   Any version of the
aggregate supply curve is acceptable.

For the vertical axis, the labelling could be price level, average price level,
PL, APL, CPI or GPL.  For the horizontal axis, the labelling could be real
GDP, real output, real income, RGDP or Y.  A title is not necessary.

**(g)  Explain the multiplier process which causes the final increase in GDP to be different from the initial increase in government spending.**     *[4]*

| Level | | Marks |
|---|---|---|
| 0 | *The work does not reach a standard described by the descriptors below.* | **0** |
| 1 | *The written response is limited.* For a response which explains that spending by one person represents income to another **OR** that an increase in government spending leads to a series of increases in income. | **1–2** |
| 2 | *The written response is clear.* For a response which explains that spending by one person represents income to another.  Thus an increase in government spending leads to a series of additional increases in income.  Therefore the eventual increase in GDP will be greater than the initial increase in government spending. | **3–4** |

A response which makes effective use of an algebraic explanation to demonstrate the successive increments in national income may be fully rewarded.

**(h)  (i)  Calculate the rate of unemployment in Country Z.**     *[2]*

$$\text{Ue rate} = \frac{66\,000}{260\,000} \times 100$$     *[1]*

*Any valid working is sufficient for [1].*

$$= 25.38\%$$     *[1]*

**(ii)** **Explain *two* difficulties economists face when they try to measure unemployment accurately.** *[4]*

| Level | | Marks |
|---|---|---|
| 0 | *The work does not reach a standard described by the descriptors below.* | **0** |
| 1 | *The written response is limited.* For one difficulty clearly explained or for two difficulties explained in a vague manner. | **1–2** |
| 2 | *The written response is clear.* For two difficulties explained clearly. Difficulties may include: | **3–4** |

  - "hidden" unemployment – underestimation as a result of individuals dropping out of the labour market, this could be because they are discouraged from looking for work
  - underemployment – underestimation as a result of part time workers who would have preferred to be working full time
  - overestimation as a result of the inclusion in the official unemployment statistic of those working in the parallel economy
  - the measure is an average, and therefore ignores disparities between groups in the economy.

Any other valid response.

**2.** **(a)** **Determine the following:**

**(i)** **Size of the tariff per kg.** *[1]*

$0.50
*An answer of 50 cents (or $0.50) is sufficient for [1].*

**(ii)** **The increase in domestic production per year resulting from the tariff.** *[1]*

90 million kg
*An answer of 90 000 000 kg (or 90 million kg) is sufficient for [1].*

**(iii)** **The decrease in domestic consumption per year resulting from the tariff.** *[1]*

80 million kg
*An answer of 80 000 000 kg (or 80 million kg) is sufficient for [1].*

**(iv)** **The tariff revenues collected per year by the government of country A.** *[1]*

$40 million
*An answer of $40 000 000 (or $40 million) is sufficient for [1].*

Examiners should be reminded that candidates who do not include the correct units should be penalized only once per question.

**(b)** **List *two* other trade barriers that the government of country A could have adopted instead of imposing a tariff.** *[2]*

| Level | | Marks |
|---|---|---|
| 0 | *The work does not reach a standard described by the descriptors below.* | **0** |
| 1 | *The written response is limited.*<br>For providing one appropriate trade barrier. | **1** |
| 2 | *The written response is clear.*<br>For providing two appropriate trade barriers. | **2** |

Trade barriers may include:
- quotas
- subsidies to domestic producers
- administrative barriers
- foreign exchange controls.

*Any other valid response.*

**(c)** **(i)** **Calculate the change in revenue earned by the domestic corn producers following the tariff.** *[3]*

Initial producer revenue $= 6.7 \times 110 = 737$ *[1]*

Producer revenue following the tariff $= 7.2 \times 200 = 1440$ *[1]*

Change in producer revenue $= 1440 - 737 = \$703$ million *[1]*

OFR applies

**(ii)** **Using your answer to (c)(i), calculate the percentage change in the revenue of domestic corn producers.** *[1]*

$$\left(\left(\frac{1440}{737}\right) - 1\right) \times 100 = \text{an increase of } 95.39\,\%$$ *[1]*

*An answer of 95.39 % or 95.39 (without workings) is sufficient for [1].*

OFR applies

**(d)  (i)  Calculate the change in revenue earned by foreign corn producers because of the tariff.**  *[3]*

Initial revenue $= (360 - 110) \times 6.70 = 1\,675$  *[1]*

Revenue following the tariff
$= (280 - 200) \times 6.70 = 536$  *[1]*

Change in producer revenue
$= 536 - 1675 = -\$1\,139\,000\,000\,(\$1139\text{ million})(\text{a decrease})$  *[1]*

OFR applies

**(ii)  Using your answer to (d)(i), calculate the percentage change in the revenue earned by foreign corn producers.**  *[1]*

$\left(\left(\dfrac{536}{1675}\right) - 1\right) \times 100 = -68\,\%\,(\text{a decrease of } 68\,\%)$  *[1]*

*An answer of –68 % or –68 (without workings) is sufficient for **[1]**.*

OFR applies

**(e)  State *one* reason why governments may decide to impose a tariff.**  *[1]*

For any one of the following:  *[1]*
- to assist domestic producers
- to maintain levels of employment
- to collect revenue
- to correct a deficit in trade of goods and services.

*Any other valid response.*

**(f) (i) Explain *two* disadvantages of trade protection.**  *[4]*

| Level | | Marks |
|---|---|---|
| 0 | *The work does not reach a standard described by the descriptors below.* | **0** |
| 1 | *The written response is limited.* For any two disadvantages merely stated or expressed in a vague manner **OR** one disadvantage clearly stated. | **1–2** |
| | A candidate who merely states one disadvantage or explains it in a vague manner may be awarded *[1]*. | |
| 2 | *The written response is clear.* For any two disadvantages explained clearly. | **3–4** |

A candidate who explains one disadvantage clearly and a second disadvantage merely stated or expressed in a vague manner may be awarded *[3]*.

Disadvantages may include:
- a misallocation of resources
- danger of retaliation and "trade wars"
- the potential for corruption
- increased costs of production due to lack of competition
- higher prices for domestic consumers
- increased costs of imported factors of production
- reduced export competitiveness.

Any other valid disadvantage should be rewarded.

**(ii)   Calculate the decrease in the consumer surplus resulting from the imposition of the tariff.**                                                                              *[2]*

The area of the trapezoid/trapezium:

$$\frac{(280+360)}{2} \times 0.5$$                                                            *[1]*

*Any valid working is sufficient for [1].*

= \$160 million                                                                            *[1]*

*An answer of \$160 million without workings is sufficient for [1].*

Or, the difference between the area of the original consumer surplus

$$\left( \frac{(8.95-6.70)\times 360}{2} \right) = 405 \text{ and the new consumer}$$

$$\text{surplus} \left( \frac{(8.95-7.20)\times 280}{2} \right) = 245$$                    *[1]*

which is –\$160 million (a decrease)                                                      *[1]*
*An answer of \$160 000 000 (or \$160 million) is sufficient for [1].*

A response which has identified \$9 as the intercept on the vertical axis and has produced an answer of \$162 million should be fully rewarded.

**(g)   Explain why the welfare loss resulting from the corn tariff is smaller than the loss of consumer surplus.**                                                               *[4]*

| Level | | Marks |
|---|---|---|
| 0 | *The work does not reach a standard described by the descriptors below.* | **0** |
| 1 | *The written response is limited.*<br>For a response which demonstrates some limited understanding of the idea that with the imposition of the tariff some stakeholders gain, while others lose. | **1–2** |
| 2 | *The written response is clear.*<br>For a response which demonstrates clear understanding that welfare loss will be smaller than the loss in consumer surplus because producer surplus increases and the government earns tariff revenues. Thus part of the loss in consumer surplus is offset by a benefit to other stakeholders *ie* domestic producers and the government.<br><br>A clear response which refers to only **one** of the gains (producer surplus **or** tariff revenues) may be awarded a maximum of *[3]*. | **3–4** |

OFR may be applied in the case of candidates who provide an incorrect response to (f)(ii) but who use their answer to provide a reasoned conclusion. To reach level 2, reference to either tariff revenue or producer surplus must be made.

**3.**   **(a)**   **(i)**   **Calculate the equilibrium price of butter in Country X.**                       *[2]*

$Q_D = Q_S$
$884 - 6P = 744 + 4P$
$10P = 140$                                                                                                  *[1]*
*Any valid working is sufficient for [1].*

$P = \$14$                                                                                                    *[1]*
*An answer of $14 or 14 (without workings) is sufficient for [1].*

***N.B.*** *An answer of 1.4 cents or $0.014 should be fully rewarded as candidates may have assumed that the price given in the question is per $000 kg.*

**(ii)**   **Calculate the equilibrium quantity per month of butter in Country X.**                           *[2]*

$Q = 884 - (6 \times 14)$ **OR** $Q = 744 + (4 \times 14)$                                                     *[1]*
*Any valid working is sufficient for [1].*

$Q = 800\,000\,\text{kg}$                                                                                     *[1]*
*An answer of 800 thousand kg or 800 (without workings) is sufficient for [1].*

**(b)**   **State the new equation for demand.**                                                              *[1]*

$Q_D = 894 - 6P$                                                                                              *[1]*

**(c)**   **(i)**   **Outline how this change will affect the steepness of the supply curve.**                *[2]*

| Level | | Marks |
|---|---|---|
| 0 | *The work does not reach a standard described by the descriptors below.* | **0** |
| 1 | *The written response is limited.* For identifying that the supply curve will become less steep (*ie* flatter/ shallower). | **1** |
| 2 | *The written response is clear.* For identifying that the supply curve will become less steep (*ie* flatter/ shallower) because, for any change in price, the change in quantity supplied will be greater, and hence the supply curve will become shallower/flatter. | **2** |
|   | Full marks may be awarded if a candidate explains that since the slope of the function increases (from +4 to +5) but the axes are reversed (the independent variable is on the vertical) the supply curve will become shallower/flatter. | |

**(ii)  Outline why this change will affect the position of the supply curve.**     *[2]*

| Level | | Marks |
|---|---|---|
| 0 | *The work does not reach a standard described by the descriptors below.* | **0** |
| 1 | *The written response is limited.*<br>For a response which indicates that the supply curve will shift to the left **OR** that the quantity supplied has decreased. | **1** |
| 2 | *The written response is clear.*<br>For a response which indicates that the supply curve will shift to the left because the quantity supplied has decreased. | **2** |

**(d)  (i)  Define the term** *price elasticity of supply (PES).*     *[2]*

| Level | | Marks |
|---|---|---|
| 0 | *The work does not reach a standard described by the descriptors below.* | **0** |
| 1 | *Vague definition.*<br>The idea that price elasticity of supply relates to changes in quantity following a change in price. | **1** |
| 2 | *Accurate definition.*<br>An explanation that price elasticity of supply is the responsiveness of supply (or, of quantity supplied) to a change in price. | **2** |

The provision of the correct formula is sufficient for *[1]* only.

$$\frac{\% \text{ change in quantity supplied}}{\% \text{ change in price}}$$

**(ii)  Calculate the PES for butter between the original and the new market price.**     *[2]*

$$PES = \frac{\%\Delta Q}{\%\Delta P} = \frac{0.5}{7.14}$$     *[1]*

*Any valid working is sufficient for [1].*

$$PES = 0.07$$     *[1]*

*An answer of 0.07 is sufficient for [1].*

OFR applies

Accurate calculation of at least one percentage is deemed to be sufficient valid working.

**(e)** **Explain *two* factors that determine the PES of a product.** *[4]*

| Level | | Marks |
|---|---|---|
| 0 | *The work does not reach a standard described by the descriptors below.* | **0** |
| 1 | *The written response is limited.* Any two factors expressed in a vague manner **OR** one factor explained clearly. <br><br> A candidate who explains one factor in a vague manner may be awarded *[1]*. | **1–2** |
| 2 | *The written response is clear.* Any two factors explained clearly. <br><br> A candidate who explains one factor clearly and a second factor in a vague manner may be awarded *[3]*. | **3–4** |

Factors may include:
- the time period: the longer the time period, the more price elastic supply will be as firms will have more time to adjust to any change in demand / price conditions
- whether the firm has excess (or, unused) capacity available: if it does, then increasing output will be easier so supply will be more price elastic
- possibility of storage: the greater the ability to store stocks, the more price elastic supply will be as firms can draw from stocks to increase the quantity supplied.

Any other valid response.

**(f)** **Calculate the resulting shortage.** *[1]*

$\text{Shortage} = Q_D - Q_S = 824 - 784 = 40$

40 000 kg of butter *[1]*
*An answer of 40 000 kg (without workings) is sufficient for [1].*

**(g)** **Calculate the change in consumer expenditure on butter per month resulting from the imposition of the price ceiling.** *[3]*

Initial consumer expenditure $= 14 \times 800 = 11\,200$ *[1]*
*An answer of 11.2 million or 11 200 000 (without workings) is sufficient for [1].*

Consumer expenditure with the price ceiling $= 10 \times 784 = 7840$ *[1]*
*An answer of 7.84 million or 7 840 000 (without workings) is sufficient for [1].*

Change in consumer expenditure $= 7840 - 11\,200 = -3\,360\,000$ (a decrease) *[1]*
*An answer of –$3.36 million or –$3 360 000 (without workings) is sufficient for [1].*

OFR applies

**(h)** **Explain *two* consequences on consumers of butter if a price ceiling (maximum price) is imposed.**                                    *[4]*

| Level | | Marks |
|---|---|---|
| 0 | *The work does not reach a standard described by the descriptors below.* | **0** |
| 1 | *The written response is limited.*<br>For any two consequences expressed in a vague manner **OR** one consequence explained clearly.<br><br>A candidate who explains one consequence in a vague manner may be awarded *[1]*. | **1–2** |
| 2 | *The written response is clear.*<br>For any two consequences explained clearly.<br><br>A candidate who explains one consequence clearly and a second consequence in a vague manner may be awarded *[3].* | **3–4** |

Consequences on consumers may include:
- some consumers will (benefit as they will) now be able to purchase butter at a lower price
- some consumers will (be worse off as they might) be unable to obtain butter due to the shortage
- some consumers (will be worse off as they) might be forced to purchase butter at a higher price in the underground/parallel market.

Any other valid explanation should be rewarded.