M13/3/ECONO/HP3/ENG/TZ0/XX/M

International Baccalaureate®
Baccalauréat International
Bachillerato Internacional

MARKSCHEME

May 2013

ECONOMICS

Higher Level

Paper 3

19 pages

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. To do this you will need to use the on-page comment annotation tool (T).*

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.*

3. *A candidate may be penalized for not rounding correctly, failing to give answers correct to 2 dp or, in some cases, for not including the appropriate units. However, a candidate may only be penalized ONCE per question (not per part) for each type of error.*

1. (a) (i) Calculate Q_D and Q_S at a price of \$14 per pack. ***[2]***

$Q_D = 700 - 25(14) = 700 - 350 = 350$ packs ***[1]***

*An answer of 350 (or 350 packs) without any valid working is sufficient for **[1 mark]** .*

$Q_S = 100 + 50(14) = 100 + 700 = 800$ packs ***[1]***

*An answer of 800 or (800 packs) without any valid working is sufficient for **[1 mark]**.*

(ii) Calculate the price which would result in a demand of 475 packs per week. ***[2]***

$475 = 700 - 25P$

$25P = 225$ ***[1]***

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

$P = \$9$ ***[1]***

*An answer of $P = 9$ (or \$9) without any valid working is sufficient for **[1 mark]** only.*

(iii) Calculate the equilibrium price and quantity. ***[2]***

At equilibrium, $Q_D = Q_S$

$700 - 25P = 100 + 50P$

$600 = 75P$

$P = \$8$ ***[1]***

An answer of $P = 8$ (or \$8) without any valid working is sufficient for ***[1 mark]*** *.*

$Q_D = 700 - 25(8)$

$Q_D = 500$ packs

OR

$Q_S = 100 + 50(8)$

$Q_S = 500$ packs ***[1]***

An answer of 500 (or 500 packs) without any valid working is sufficient for ***[1 mark]*** *.*

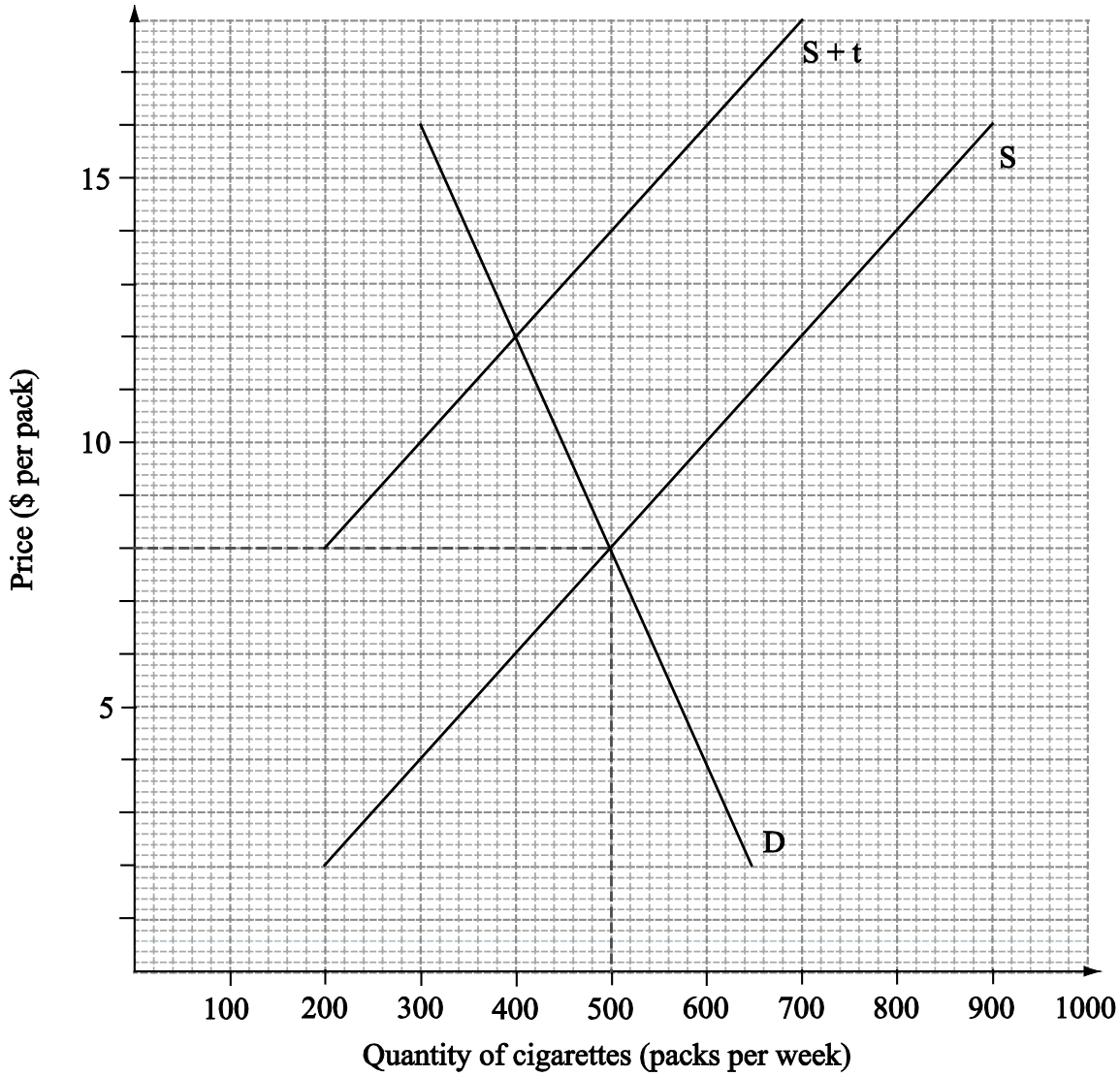
(b) On the axes below, draw the demand and supply curves using a price range from $2 to $16 per pack. Each curve should be labelled. ***[4]***

For a correctly constructed demand curve. ***[1]***
For a correctly labelled demand curve (D). ***[1]***

For a correctly constructed supply curve. ***[1]***
For a correctly labelled supply curve (S). ***[1]***

Candidates who plot curves incorrectly but provide appropriate labels should not be rewarded for labelling the curves. The dotted lines from the equilibrium point to the axes are not required.

Candidates who do not use the specified price range of $2 to $16 per pack but who draw accurate curves may be awarded full marks.



(c) In order to discourage the consumption of cigarettes, the government imposes a specific indirect tax of $6 per pack.

On the above graph, plot the new supply curve to illustrate the effect of the indirect tax. ***[2]***

For drawing a new supply curve parallel and above/to the left of the original supply curve. ***[1]***

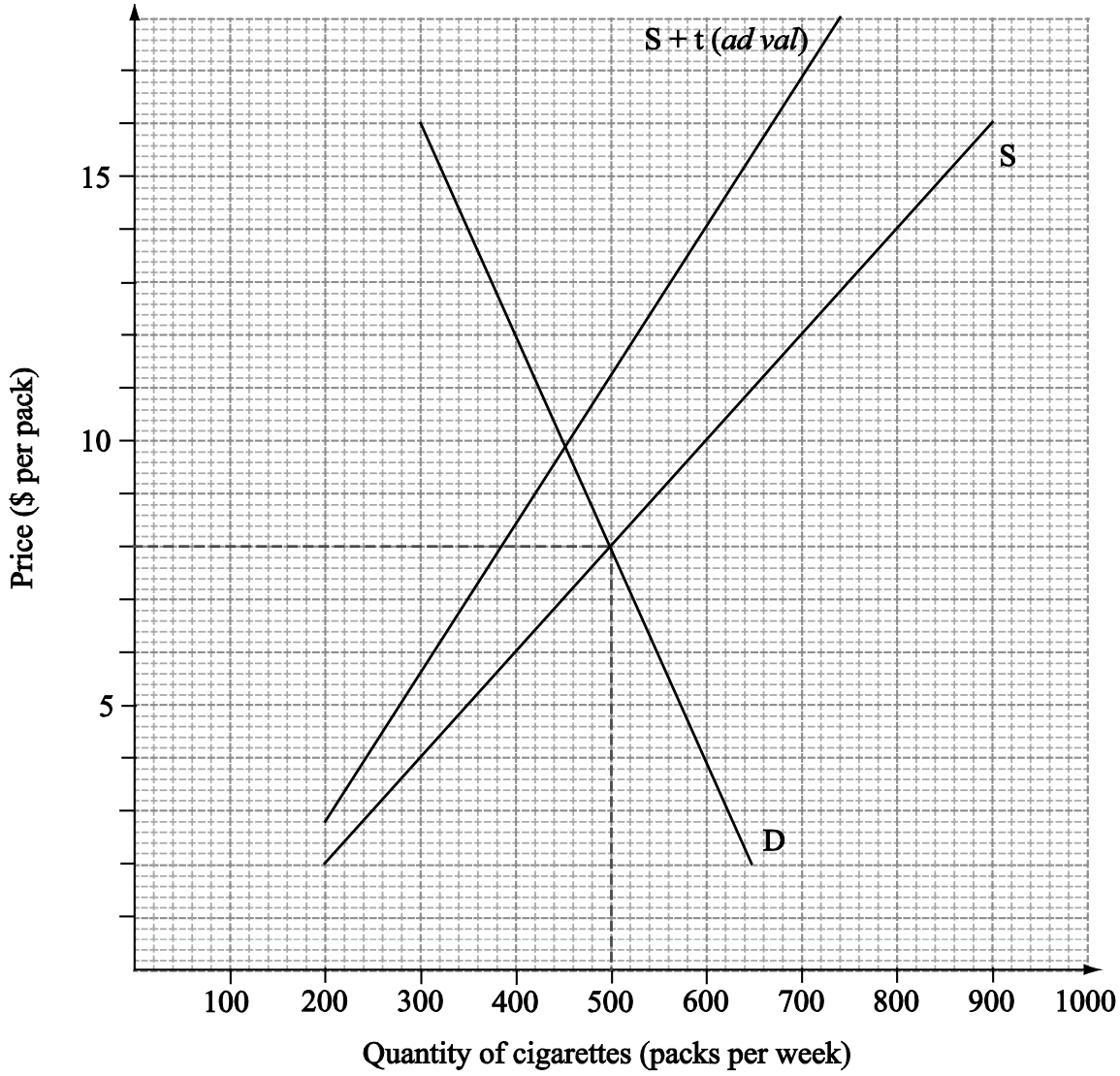
OR

For accurately drawing the new curve parallel to the original supply curve and $6 above the original. ***[2]***

N.B. Candidates who plot a new supply curve above and parallel to the original, but which is not $6 above the original, should be awarded ***[1 mark]***.

It is not necessary to illustrate the effect of the tax in any other way (*eg* with arrows from the original price to the new price).

(d) On the axes below, sketch a diagram and explain how the new supply curve would have been different if the government had imposed an *ad valorem* tax on cigarettes. ***[4]***



continued …

Question 1(d) continued

Level

0 *The work does not reach a standard described by the descriptors below.* **0**

1 *There is a correct diagram or an accurate response.* **1–2**
For drawing an accurate, labelled diagram showing two supply curves, one of which is above/to the left of the other, and which diverges as price increases **or** for explaining that an *ad valorem* tax is calculated as a percentage of the price of the product. Therefore, as price increases, the size of the tax also increases. Thus the new supply curve would be above and steeper than the original.

2 *There is a correct diagram and an accurate response.* **3–4**
For drawing an accurate, labelled diagram showing two supply curves, one of which is above/to the left of the other, and which diverges as price increases **and** for explaining that an *ad valorem* tax is calculated as a percentage of the price of the product. Therefore, as price increases, the size of the tax also increases. Thus the new supply curve would be above and steeper than the original.

Candidates who incorrectly label diagrams can be rewarded with a maximum of ***[3 marks]***.

It is not required that the original supply curve be plotted accurately – the command term is "sketch". A demand curve is not necessary.

(e) Calculate the total weekly revenue earned by the government from the specific tax. ***[2]***

tax revenue $= 6 \times 400$

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

$= \$2400$ ***[1]***

An answer of $2400 or 2400 without any valid working is sufficient for ***[1 mark]*** *only.*

OFR applies

NB Candidates who use their answer to part (d) (*ad valorem* tax) for this part should receive ***[0 marks]***. Candidates who have calculated the new equilibrium by using the new supply equation (rather than reading it from the graph) should be fully rewarded. If they do so, and the new equilibrium is calculated incorrectly but the result is used appropriately then ***[1 mark]*** may be awarded.

(f) Calculate the change in weekly consumer spending on cigarettes in Burbia as a result of the tax. ***[3]***

Initial spending $= 8 \times 500 = 4000$ ***[1]***

*An answer of $4000 or 4000 without any valid working is sufficient for **[1 mark]** only.*

New spending $= 12 \times 400 = 4800$ ***[1]***

*An answer of $4800 or 4800 without any valid working is sufficient for **[1 mark]** only.*

Change in spending $= 4800 - 4000 = \$800$

*An answer of $800 or 800 with no valid workings is sufficient for **[1 mark]** only.*

OFR applies

(g) Explain why the value of price elasticity of demand is important for a government which is attempting to use taxation to discourage the consumption of a product. ***[4]***

Level

0 *The work does not reach a standard described by the descriptors below.* **0**

1 *The written response is limited.* **1–2**
For explaining that the value of price elasticity of demand will influence the number of consumers who will be discouraged from consuming the product.

2 *The written response is accurate.* **3–4**
For explaining that if demand is price inelastic the resulting decrease in quantity demanded will be proportionately smaller than the increase in price. Therefore the government's attempt to discourage the consumption of a product will be less effective.

N.B. Candidates who explain the issue using an example where demand is price elastic (explaining that in this case the policy will be more effective) should be fully rewarded.

For full marks, candidates must refer to the proportional or relative changes in quantity demand.

2. (a) Calculate the monthly cost of the typical basket of goods in

(i) 2011; ***[2]***

$(2 \times 20) + (10 \times 15) + (1.20 \times 10) + (1.60 \times 5) + (5 \times 10)$ ***[1]***

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

$= \$260$ ***[1]***

*An answer of $260 or 260 without any valid working is sufficient for **[1 mark]** only.*

(ii) 2012. ***[2]***

$(2.20 \times 20) + (12 \times 15) + (1.50 \times 10) + (3.20 \times 5) + (5 \times 10)$ ***[1]***

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

$= \$305$ ***[1]***

*An answer of $305 or 305 without any valid working is sufficient for **[1 mark]** only.*

(b) From your results in (a), calculate the percentage change in the cost of living in Ruritania from 2011 to 2012. ***[2]***

$\frac{305 - 260}{260} \times 100$ ***[1]***

*Any valid working is sufficient for **[1 mark]**.*
There may be several valid methods of obtaining a correct answer, eg

$\left(\frac{305}{260} - 1\right) \times 100$

$= 17.31\%$ or, 17.31 ***[1]***

*An answer of 17.31% or 17.31 without any valid working is sufficient for **[1 mark]** only.*

(c) (i) In neighbouring Urbania the cost, in yen (¥), of the typical basket of goods is shown below. Using 2009 as a base year (2009 = 100), construct the consumer price index for Urbania from 2009 to 2012. Show your workings and enter your results in the table below. ***[3]***

Year	Cost of the typical basket (¥)	Workings	Consumer price index for Urbania (2009 = 100)
2009	1355	—	**100**
2010	1470	$\frac{\mathbf{1470\times100}}{\mathbf{1355}}$	**108.49**
2011	1705	$\frac{\mathbf{1705\times100}}{\mathbf{1355}}$	**125.83**
2012	1790	$\frac{\mathbf{1790\times100}}{\mathbf{1355}}$	**132.10**

For a correct answer with valid workings for 2010 award ***[1 mark]***.
For a correct answer with valid workings for 2011 award ***[1 mark]***.
For a correct answer with valid workings for 2012 award ***[1 mark]***.
If a candidate provides no correct final answers but some workings are valid ***[1 mark]*** may be awarded

(ii) From your answers to part (c)(i), calculate the rate of inflation in Urbania between 2010 and 2011. ***[2]***

$\frac{125.83-108.49}{108.49}\times100$ ***[1]***

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

$=15.98\,\%$ ***[1]***

An answer of 15.98 % (or 15.98) without any valid working is sufficient for ***[1 mark]*** *only.*

(iii) With reference to the terms inflation and disinflation, describe the changes in the cost of living in Urbania during the period 2009 to 2012. ***[2]***

Level

0 *The work does not reach a standard described by the descriptors below.* **0**

1 *There is limited understanding.* **1**
For describing that prices are rising during the period 2009–2012 hence inflation is occurring.

2 *There is clear understanding.* **2**
For describing that prices are rising (candidates may use the term inflation) at a decreasing rate during the period 2011–2012 hence disinflation.

OFR applies.

(d) Explain *two* problems which economists face when using a consumer price index to measure the rate of inflation. ***[4]***

Level

0 *The work does not reach a standard described by the descriptors below.* **0**

1 *The written response is limited.* **1–2**
For one problem explained clearly or two problems explained in a vague manner.

2 *The written response is accurate.* **3–4**
For two problems explained clearly.

Problems may include:

- different income earners may experience a different rate of inflation as their consumption patterns differ and so the CPI may not accurately represent their cost of living
- CPI figures may not accurately reflect consumption patterns as these change over time, as does the quality of products purchased
- there may be wide regional differences in prices, so the CPI may not accurately reflect the cost of the basket of goods in all parts of the country
- any other valid response.

N.B. Candidates may use terms such as “substitution bias” and “quality bias” but such terms are not necessary to earn full marks.

(e) Calculate the percentage change in the real GDP of Urbania from 2009 to 2010. ***[4]***

Real GDP in 2010, expressed in 2009 prices =

$65 \times \frac{100}{114}$ ***[1]***

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

= 57.02 billion or 57 020 000 000 ***[1]***

% change in real GDP $= \frac{57.02 - 60}{60} \times 100$ ***[1]***

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

$= -4.97\ \%$ or – 4.97 ***[1]***

*An answer of $-4.97\ \%$ or – 4.97 without any valid working is sufficient for **[1 mark]** only.*

NB Candidates may use an alternative method which identifies the percentage change in real GDP as percentage change in nominal GDP – percentage change in the price level.

percentage change in nominal GDP =

$\frac{65 - 60}{60} \times 100$ ***[1]***

$= 8.33$ ***[1]***

% change in the price level = 14 $\left(\text{from table} = \frac{114 - 100}{100} \times 100 \right)$ ***[1]***

% change in real GDP $= 8.33 - 14 = -5.67\ \%$ ***[1]***

An answer of $-5.67\ \%$ or – 5.67 *without any valid working is sufficient for **[1 mark]** only.*

OFR applies

(f) When calculating inflation for the purpose of policy-making, economists might calculate a core/underlying rate of inflation. Explain why they do this. ***[4]***

Level

0 *The work does not reach a standard described by the descriptors below.* **0**

1 *The written response is limited.* **1–2**
For explaining that a core/underlying rate of inflation ignores the impact of sudden/short-term factors which may influence the level of inflation.

2 *The written response is accurate.* **3–4**
For explaining that large and sudden changes in the price of one or two products (or product groups) may distort the measured rate of inflation. In order to focus on the general price trend, the government may calculate a core/underlying rate of inflation, which excludes products or product groups with highly volatile prices, such as energy and food, on which to base economic policy

N.B. Reference to specific products/product groups such as food and energy is not required.

3. The information below represents the weekly cost and revenue conditions of a firm, measured in dollars ($).

Output (Q)	Price per unit	Total revenue (TR)	Average revenue (AR)	Marginal revenue (MR)	Total cost (TC)	Marginal Cost (MC)
1	50	**50**	**50**		35	
				40		**10**
2	45	**90**	**45**		45	
				30		**15**
3	40	**120**	**40**		60	
				20		**20**
4	35	**140**	**35**		80	
				10		**25**
5	30	**150**	**30**		105	
				0		**30**
6	25	**150**	**25**		135	
				–10		**35**
7	20	**140**	**20**		170	
				–20		**40**
8	15	**120**	**15**		210	

(a) Complete the table above by entering the total revenue, average revenue, marginal revenue and marginal cost information for all levels of output. ***[4]***

For an accurate total revenue column award ***[1 mark]***.
For an accurate average revenue column award ***[1 mark]***.
For an accurate marginal revenue column award ***[1 mark]***.
For an accurate marginal cost column award ***[1 mark]***.

NB *MC and MR figures may be entered between the units of output or at the second unit of output.*

(b) (i) Using your answers from part (a), identify the profit-maximizing level of output for the firm. You *must* outline the reason for your answer. ***[3]***

Profit is maximised where MC = MR ***[2]***
Therefore, profit is maximised at 4 units of output ***[1]***

OR

Profit equals TR – TC ***[2]***
Profit is highest ($60) at (3 or) 4 units of output
Therefore profit is maximized at (3 or) 4 units of output ***[1]***

(ii) Calculate the economic profit/loss which the firm would make at this level of output. ***[2]***

At 4 units of output, TR = 140, TC = 80
or, at 3 units of output, TR=120, TC=60 ***[1]***

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

Profit = \$60 ***[1]***

An answer of \$60 or 60 without any valid working is sufficient for ***[1 mark]*** *only.*

OFR applies

(c) (i) Calculate the price elasticity of demand for the product when price falls from \$25 to \$20. ***[2]***

$$\text{PED} = \frac{\%\ \Delta \text{Qd}}{\%\ \Delta \text{P}} = \frac{16.67}{20}$$ ***[1]***

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

$= 0.83$ or -0.83 ***[1]***

An answer of 0.83 (or −0.83) without any valid working is sufficient for ***[1 mark]*** *only.*

Correct use of negative sign for ΔP and PED may be present but is not necessary.

N.B. Candidates who use an accurate midpoint formula may be fully rewarded.

$$\frac{1}{6.5} \div \frac{5}{22.5}$$

$= 0.69$ or -0.69

An answer of 0.69 (or −0.69) without any valid working is sufficient for ***[1 mark]*** *only*

(ii) Using the table on page 16 to illustrate your answer, explain why the price elasticity of demand would change along the demand curve. ***[4]***

Level

0 *The work does not reach a standard described by the descriptors below.* **0**

1 *The written response is limited.* **1–2**
For an explanation that as price/quantity changes, the percentage changes in price and quantity change, causing PED to change.

2 *The written response is accurate.* **3–4**
For an explanation that as price increases along a straight line demand curve the percentage change in quantity demanded increases while the percentage change in price decreases. Therefore demand becomes more elastic.

The following explanation is also valid: PED = slope $\times \frac{P}{Q}$
Since the slope is constant along a straight line, PED is equal to a constant number $\times \frac{P}{Q}$ whose value constantly changes along the demand curve. Therefore, as we move along the demand curve, PED changes.

N.B. A similar explanation which refers to a price decrease is also acceptable

Full marks may be earned without specific reference to the figures in the table.

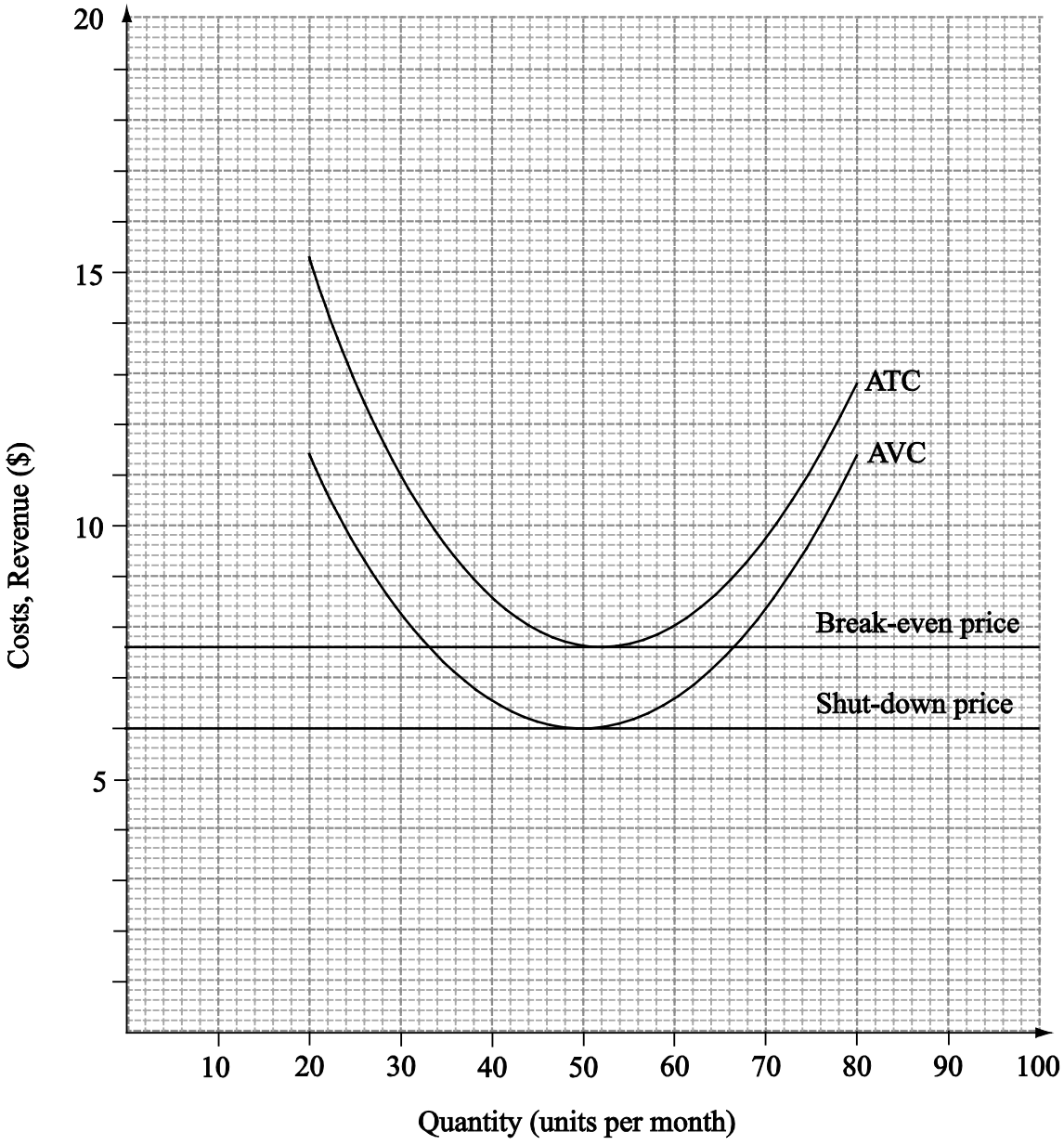
(d) The graph below illustrates the average total cost and average variable cost information for a firm.

On the graph, identify the break-even price and the shut-down price for a perfectly competitive firm. ***[2]***

For correct identification of the shut-down price award ***[1 mark]***.
For correct identification of the break-even price award ***[1 mark]***.

NB Candidates may identify the shut-down price and break-even price by:
- drawing a horizontal line tangential to the lowest point of the AVC and ATC curves
- indicating the correct values or position on the vertical axis. (Break-even = $7.60, shut down = $6)
- writing the correct figures for each (distinguished correctly) somewhere on the graph.

A candidate who circles the lower point of each curve, AND appropriately identifies one as break-even and the other as shut down may be awarded ***[1 mark]***.



(e) From the graph in part (d)

(i) calculate the total variable cost if output is 50 units per month; ***[2]***

$\text{TVC} = 50 \times 6$ ***[1]***

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

$= \$300$ ***[1]***

An answer of \$300 or 300 without any valid working is sufficient for ***[1 mark]*** *only.*

(ii) calculate total cost if output is 30 units per month. ***[2]***

$\text{TC} = 30 \times 11$ ***[1]***

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

$= \$330$ ***[1]***

An answer of \$330 or 330 without any valid working is sufficient for ***[1 mark]*** *only.*

(f) With reference to the graph in part (d), explain the difference between the break-even price and the shut-down price. ***[4]***

Level

0 *The work does not reach a standard described by the descriptors below.* **0**

1 *The written response is limited.* **1–2**
For an explanation that break-even price is the price at which a firm is able to just cover its average total costs while the shut down price is the price at which a firm is able to just cover its average variable costs OR for explaining that in the short run a firm may stay in business even if the price is below the break-even level provided that it is greater than or equal to the minimum average variable cost so that it makes a contribution towards its fixed costs.

2 *The written response is accurate.* **3–4**
For an explanation that break-even price is the price at which a firm is able to just cover its average total costs while the shutdown price is the price at which a firm is able to just cover its average variable costs AND for explaining that in the short run a firm may stay in business even if the price is below the break-even level provided that it is greater than or equal to the minimum average variable cost so that it makes a contribution towards its fixed costs.