

FOR THE
IB DIPLOMA

Economics

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PAPER 3
WORKBOOK

ANSWERS

 **HODDER**
EDUCATION

Economics

for the IB Diploma

The foundations of economics

- 1 a The convex shape of the PPF curve shows that the economy has to give up increasing amounts of consumer goods to produce an extra unit of producer goods, and vice versa. Hence, as the output of one good increases, the opportunity cost of producing additional units of the other good rises. There is diminishing marginal utility as the production and consumption of one particular good rises.

Award 1 mark for a brief answer that shows some understanding.

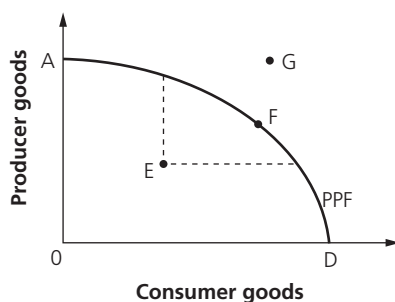
Award 2 marks for a clear understanding of why the PPF curve is drawn as convex to the origin.

- b By producing OC units of consumer goods (and hence OB units of producer goods), the economy forgoes BA units of producer goods.

Award 1 mark for a brief answer that shows some understanding.

Award 2 marks for a clear understanding of the opportunity cost of the economy in producing OC units of consumer goods.

- c **Point E** – this is because the economy can increase the output of both producer goods *and* consumer goods. At Point F, the economy is productively efficient so a reallocation of resources necessarily means fewer producer goods *or* consumer goods. Point G is unattainable without economic growth in the long run.



Award 1 mark for a brief answer that shows some understanding.

Award 2 marks for a clear understanding that explains why the answer is Point E.

- 2 a ■ Accounting profit = Total revenue – Total costs
■ $\$900,000 - \$760,000 = +\$140,000$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b ■ Economic profit = Accounting profit – Opportunity cost
■ In this case, if the dentist opens her own clinic, she forgoes her salary of \$150,000.
■ Hence, economic profit = $\$140,000 - \$150,000 = -\$10,000$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c Although the dentist would earn an accounting profit of \$140,000 a year, she already earns \$150,000. So, by switching she would actually lose \$10,000 a year. Hence, on economic grounds alone, she should not open her own dental clinic.

Award 1 mark for a brief answer that shows some understanding.

Award 2 marks for a clear understanding of why the dentist should not open her own dental clinic.

- 3 By producing an extra 5 units of investment goods (from 30 to 35), the opportunity cost is 10 fewer units of consumption goods. Hence, the ratio is 5 : 10, i.e. the opportunity cost of producing 1 unit of investment goods is 2 units of consumption goods.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 4** For each extra 3,000 units of televisions produced, the firm sacrifices 9,000 units of laptops. This gives a ratio of 3 : 9, i.e. the opportunity cost of producing 1 unit of televisions is 3 units of laptops.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 5 a** For each extra 20 kg of strawberries, the farmer sacrifices 60 kg of potatoes. This gives a ratio of 20:60 or 1 : 3, i.e. the opportunity cost of producing 1 kg of strawberries is 3 kg of potatoes.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b** If the farmer produces an extra 60 kg of potatoes by increasing output from 740 kg to 800 kg, the sacrifice is 20 kg less output of strawberries. Hence, the opportunity cost is 20 kg of strawberries.

Award 1 mark for the correct answer and 1 mark for showing the working out.

Section 1 Microeconomics

1.1 Competitive markets: demand and supply

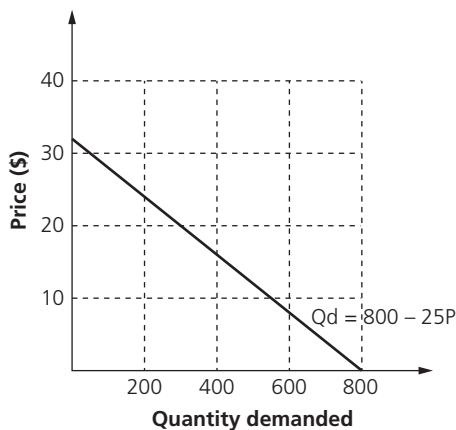
Demand

1 The linear demand function is given as $Q_d = a - bP$ where:

- a = autonomous demand, i.e. the level of demand irrespective of the price.
- $-b$ = the slope of the demand curve, i.e. how the price affects the quantity demanded.
- Any change in a causes a *change in demand*, i.e. a shift of the demand curve.
- Any change in b will change the *quantity demanded* and the steepness of the demand curve.

Award 1 mark for each of the components above.

- 2
- First, calculate the intercepts on the x -axis and y -axis.
 - The intercept on the y -axis (price) is $0 = 800 - 25P$, i.e. $25P = 800$. Hence, $P = \$32$.
 - The intercept on the x -axis (quantity) occurs when $P = 0$, i.e. $Q_d = 800$ units.
 - Join these two points with a ruler to get the demand curve.



Award 1 mark for each axis that is accurately scaled and correctly labelled, up to 2 marks.

Award up to 2 marks for accurately drawing the demand curve, intercepting the y -axis at \$32 and the x -axis at 800 units.

Apply the own figure rule (error carried forward) where appropriate.

- 3
- To find the gradient (slope) of the demand curve, divide 600 by 15 = 40.
 - When $P = 0$, quantity demanded = 600.
 - Hence, the demand function is $Q_d = 600 - 40P$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 4
- First, calculate the quantity demanded when $P = \$8$.
 - When $P = \$8$, $Q_d = 420 - 12(8) = 420 - 96 = 324$ kg of organic chicken.
 - At \$8 per kg and sales of 324 kg, sales revenue = $\$8 \times 324 = \mathbf{\$2,592}$ per day.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 5 To work out the change in sales revenue, it is necessary to calculate the revenue at \$7 and \$8 per unit.
- Originally, $P = \$7$ and $Q_d = 60,000$ kg, so sales revenue = \$420,000.
 - At the new price of \$8, Q_d falls to 50,000 kg, so the new sales revenue drops to \$400,000.
 - Hence, the change in sales revenue = $-\$20,000$.
 - It seems that the firm was unwise to raise its price on this occasion.

Award up to 2 marks for calculating (and showing the working out for) the change in the value of sales revenue.

Award up to 2 further marks for the commentary (knowledge and application of price elasticity of demand is not required for this question, but can be used if appropriate).

Supply

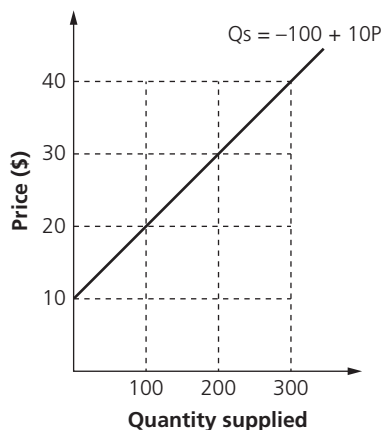
- 1 To answer this question, it is necessary to calculate the value of price on the y-axis intercept, i.e. when $Q = 0$.
- $0 = -800 + 20P$
 - $800 = 20P$
 - $P = \$40$
 - Hence, any price at or above \$40 creates an ability and willingness to supply the product.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 2 ■ Originally, $Q_s = 300 + 10P$.
- A rightwards shift by 200 units at each price level changes the constant (c) of the linear function, so c becomes $300 + 200 = 500$.
 - Hence, the new supply function is $Q_s = 500 + 10P$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 3 ■ First, calculate the intercept on the y-axis (price), i.e. $\frac{100}{10} = \$10$.
- Choose another (higher) price, say \$40, and substitute into the equation = $-100 + 10(\$40) = 300$ units.
 - Join these two points with a ruler to get your supply curve.



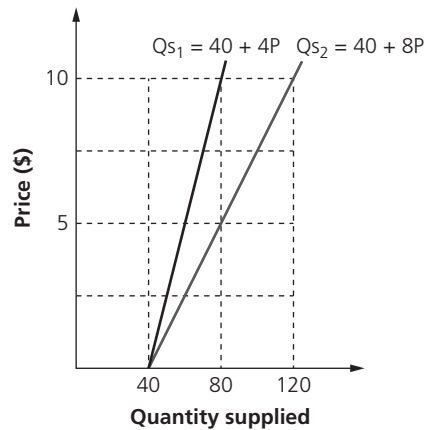
Award 1 mark for each axis that is accurately scaled and correctly labelled, up to 2 marks.

Award up to 2 marks for accurately drawing the supply curve, intercepting the y-axis at \$10.

Apply the own figure rule (error carried forward) where appropriate.

4 The greater the coefficient of P (the slope of the supply curve), the flatter the supply curve. Hence, $Q_{S_2} = 40 + 8P$ is flatter. For each \$1 increase in price, supply changes by 8 times, whereas it only changes by 4 times in the supply function $Q_{S_1} = 40 + 4P$. To check this:

$Q_{S_1} = 40 + 4P$		$Q_{S_2} = 40 + 8P$
$Q_{S_1} = 40$	$P = 0$	$Q_{S_2} = 40$
$Q_{S_1} = 60$	$P = 5$	$Q_{S_2} = 80$
$Q_{S_1} = 80$	$P = 10$	$Q_{S_2} = 120$



Note: The diagram above is for illustrative purposes only and is not required in the written answer.

Award 1 mark for a brief answer that shows some understanding or choosing the correct answer but without a clear explanation.

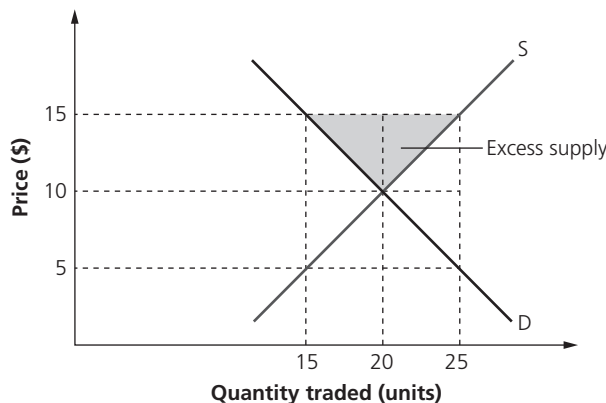
Award 2 marks for a clear understanding of why $Q_{S_2} = 40 + 8P$ is the flatter of the two supply curves.

- 5 ■ To determine the value of the slope of the supply curve, we can see that $\frac{\Delta Q}{\Delta P} = \frac{200}{10} = +20$.
- Hence, the value of $dP = +20P$.
- To determine the y-axis intercept, we know $Q_s = 0$ when $P = 30$.
- As $Q_s = c + dP = 0$.
- So, $dP = 20(30) = 600$.
- Hence, $c = -600$.
- So we have $-600 + 20(30) = 0$ for the y-axis intercept.
- Therefore, the linear function is $Q_s = -600 + 20P$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

Market equilibrium

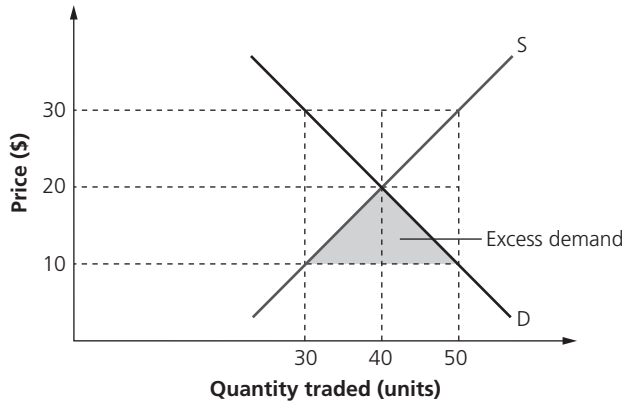
- 1 ■ Excess supply occurs at a price above the equilibrium.
- At a price of \$15, there will be excess supply of 10 units: the quantity demanded is 15 units while the quantity supplied is 25 units.
- Hence, at a price of \$15, the excess supply is calculated as: $\frac{(\$15 - \$10) \times 10 \text{ units}}{2} = \25 .



Note: The diagram above is for illustrative purposes only and is not required in the written answer.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 2 ■ Excess demand occurs at a price below the equilibrium.
 - At a price of \$10, there will be excess supply of 20 units: the quantity demanded is 50 units, while the quantity supplied is 30 units.
 - Hence, at a price of \$10, the excess demand is calculated as: $\frac{(\$20 - \$10) \times 20 \text{ units}}{2} = \100 .



Award 1 mark for the correct answer and 1 mark for showing the working out.

3

Price (\$)	Quantity demanded	Q _{s1}	Q _{s2}
4	110	50	70
5	100	60	80
6	90	70	90
7	80	80	
8	70	90	

The new equilibrium price is \$6. As the lower costs of production causes supply to increase by 20 units at all prices, the firm can now supply 90 units at \$6 (it was only able and willing to supply 70 units at \$6 before).

Award 1 mark for the correct answer and 1 mark for showing the working out.

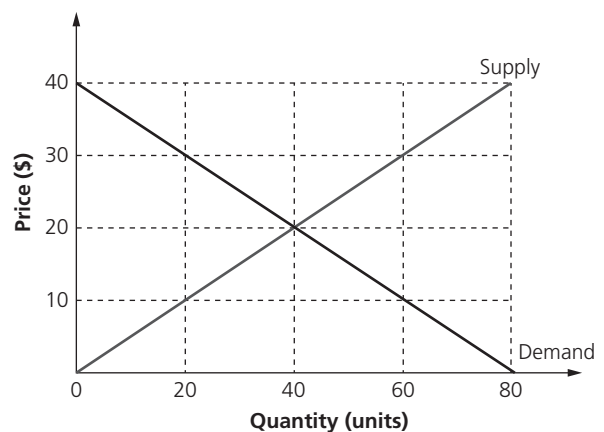
- 4 ■ Equilibrium exists when the D and S functions are equal, i.e. $a - bP = c + dP$.
 - $600 - 3P = -100 + 2P$
 - $700 = 5P$
 - Hence, equilibrium price = $\frac{700}{5} = \$140$.
 - And equilibrium quantity traded = $600 - 3(140) = 180 \text{ units}$.
 - Or using the supply function, we also get $-100 + 2(140) = 180 \text{ units}$.

Award 1 mark for the correct equilibrium price and 1 mark for the correct equilibrium quantity.

Award 1 mark for showing the working out.

- 5 a Substitute values of P into the linear equations to give the following:

P (\$)	Q _d	Q _s
0	80	0
10	60	20
20	40	40
30	20	60
40	0	80

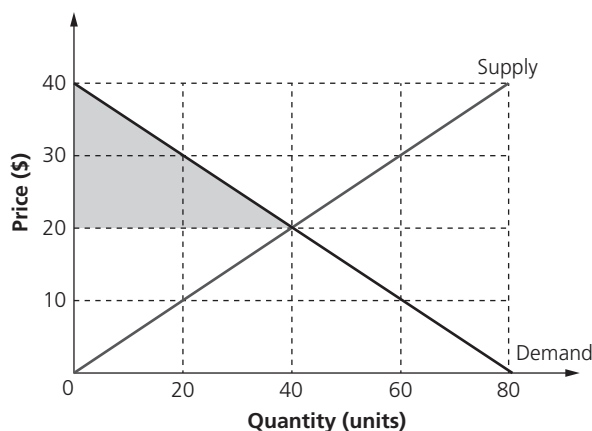


(Note: Only 2 points are required to draw each of the linear demand and supply curves.)

Award up to 3 marks for an accurately drawn and correctly labelled diagram.

Award 1 further mark for correctly identifying the equilibrium price and equilibrium quantity.

- b** ■ Consumer surplus exists when there are customers willing and able to pay more than the equilibrium price. Hence, at \$20, the consumer surplus is shown by the triangular area under the demand curve, above the equilibrium price level.
- The value of the consumer surplus is therefore $\frac{(\$40 - \$20) \times 40}{2} = \$400$.



Award 1 mark for the correct answer and 1 mark for showing the working out.

- c** From the graph, it can be seen that:
- If price is \$10, demand = 60 and supply = 20.
 - Hence, there is excess supply of $60 - 20 = 40$ units.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d** From the graph, it can be seen that:
- At a price of \$30, demand = 20 units and supply = 60 units.
 - Hence, there is excess supply of **40 units**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

1.2 Elasticity

Price elasticity of demand (PED)

- 1 a** ■ Sales revenue = Price \times Quantity
- $\$4 \times 200 = \800

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b** ■ New price = $\$4 \times 1.2 = \4.80
- PED is known to be -2.0 .
 - Change in quantity demanded: $-2.0 = \frac{x\%}{+20\%} = -40\%$
 - New quantity demanded = $200 \times 0.6 = 120$
 - New sales revenue = $120 \times \$4.80 = \576

Award 1 mark for the correct answer and up to 2 marks for showing the full working out.

- c** Sales revenue has fallen from \$800 per day to \$576. This is because the demand for its product is price elastic (-2.0) so the 20% increase in price caused a greater proportional fall (40%) in the quantity demanded. Thus, it was not a good decision for Juke Ltd. to increase its price.

Award 1 mark for a brief answer that shows some understanding.

Award 2 marks for a clear understanding of why it was not a good decision for the firm to raise its price.

- 2 a** PED = 1 at the mid-point on a linear downwards-sloping demand curve.

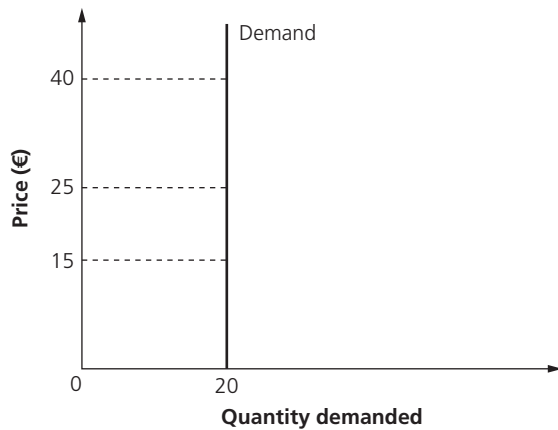
Award 1 mark for correctly identifying the value of the PED.

- b** If the price drops below \$10, total revenue will fall below \$6,000 (\$10 × 600 units). To the right of the mid-point, demand is price inelastic, so a fall in price leads to a proportionately smaller change in quantity demanded. Hence, total revenue will fall.

Award 1 mark for stating total revenue will fall and up to 1 further mark for correctly explaining why this is the case.

- 3 ■** PED = 0, i.e. it is perfectly price inelastic.
- As price increases from €15, to €25 to €40, the quantity demanded (sales revenue ÷ unit price) remains constant at 20 units.

Unit price (€)	15	25	40
Sales revenue (€)	300	500	800
Quantity demanded	20	20	20



Note: The diagram above is for illustrative purposes only and is not required in the written answer.

Award up to 2 marks for calculating the PED, including the correct working out.

Award up to 1 further mark for an appropriate commentary.

- 4 a** PED if the price increases from \$4 to \$5:

- $Q_{d1} = 400 - 25(4) = 300$
- $Q_{d2} = 400 - 25(5) = 275$
- $\% \Delta Q_d = \frac{275 - 300}{300} = -8.33\%$
- $\% \Delta P = \frac{5 - 4}{4} = +25\%$
- $PED = \frac{8.33}{25} = -0.33$

PED if the price increases from \$10 to \$11:

- $Q_{d1} = 400 - 25(10) = 150$
- $Q_{d2} = 400 - 25(11) = 125$
- $\% \Delta Q_d = \frac{125 - 150}{10} = -16.67\%$
- $\% \Delta P = \frac{11 - 10}{10} = +10\%$
- $PED = \frac{8.33}{25} = -1.67$

Award up to 2 marks for the correct answers (calculations) and up to 1 further mark for the working out.

- b** As the price for the good increases, the PED also increases. This is because customers become more responsive (sensitive) to changes in price as the price of the product increases.

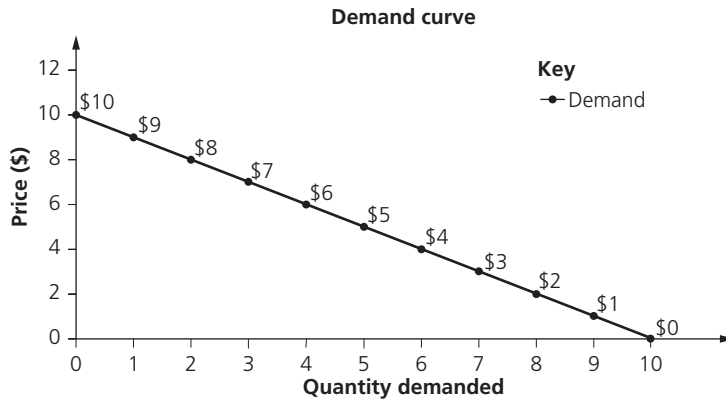
Award 1 mark for appropriate use of the answer to Question 4a and up to 1 further mark for explaining the answer, i.e. PED increases in value as the price of the product increases.

- c** As the $PED = -1$, this means a 5% drop in price will cause the quantity demanded to rise by 5%. Unitary elasticity results in no change in the firm's total revenue.

Award 1 mark for a brief answer that shows some understanding.

Award 2 marks for a clear understanding of why unitary elasticity does not result in a change in the firm's total revenue.

5 a

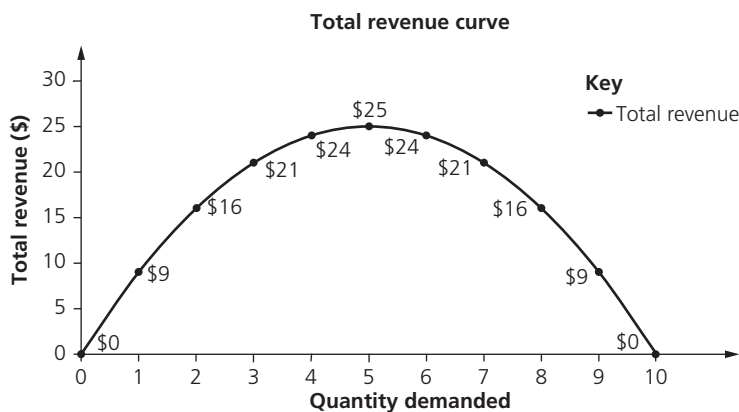


Award up to 2 marks for correctly drawing and labelling the x- and y-axis, using an appropriate scale.

Award another 1 mark for correctly plotting and labelling the demand curve.

b

Price per unit (\$)	Quantity demanded	Total revenue (P×Q)
\$10	0	\$0
\$9	1	\$9
\$8	2	\$16
\$7	3	\$21
\$6	4	\$24
\$5	5	\$25
\$4	6	\$24
\$3	7	\$21
\$2	8	\$16
\$1	9	\$9
\$0	10	\$0



Award up to 2 marks for correctly drawing and labelling the x- and y-axis, using an appropriate scale.

Award another 1 mark for correctly plotting and labelling the total revenue curve.

Price per unit (\$)	Quantity demanded	Total revenue (P×Q)	Price elasticity of demand
\$10	0	\$0	10
\$9	1	\$9	9
\$8	2	\$16	4
\$7	3	\$21	2.33
\$6	4	\$24	1.5
\$5	5	\$25	1
\$4	6	\$24	0.67
\$3	7	\$21	0.43
\$2	8	\$16	0.25
\$1	9	\$9	0.11
\$0	10	\$0	0

To the left of the mid-point, i.e. at prices higher than \$5 per unit, demand is relatively price elastic so raising prices simply reduces total revenue. By contrast, to the right of the mid-point, i.e. at prices below \$5, demand becomes relatively price inelastic so reducing prices will only lower total revenue.

Award 1 mark for a brief answer that shows some understanding but without necessarily referring to the data.

Award 2 marks for a good understanding with some appropriate use of the data.

Award 3 marks for a clear understanding with appropriate use of the data.

Cross price elasticity of demand (XED)

- 1** ■
$$\text{XED} = \frac{\% \Delta \text{Demand for good A}}{\% \Delta \text{Price of good B}}$$
- Complementary goods are jointly demanded, e.g. hotdog buns and hotdog sausages.
 - An increase in the price of hotdog buns will reduce demand, ceteris paribus, so will reduce the demand for hotdog sausages.
 - Hence, as the price of one good increases, the demand for its complementary good falls, i.e. there is a negative correlation.

Award 1 mark for a brief answer that shows some understanding.

Award 2 marks for a clear understanding of why the XED for complementary goods is negative.

- 2** As the two products are substitutes, the XED will be positive, i.e. the fall in the price of McDonald's coffee causes a drop in the demand for Starbucks's coffee. The XED can then be calculated as:

$$\begin{aligned} & \frac{\% \Delta \text{Quantity demanded for Starbucks's coffee}}{\% \Delta \text{Price of McDonald's coffee}} \\ &= \frac{-2\%}{-8\%} = \frac{1}{4} = +0.25 \end{aligned}$$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 3** ■ The percentage change in quantity demanded = $\frac{200 - 225}{225} \times 100 = -11.1\%$.
- The percentage change in price = $\frac{26.95 - 24.5}{24.5} \times 100 = +10\%$.
 - Thus, the XED = $\frac{-11.1\%}{+10\%} = -1.11$.
 - This means the two products (monthly disposable contact lenses and contact lens solution) are considered to be strong complements.

Award up to 2 marks for the calculation of the XED (correct answer and working out).

Award up to 1 further mark for an appropriate commentary.

$$4 \quad \text{XED} = \frac{\% \Delta \text{Quantity demanded of goggles}}{\% \Delta \text{Price of swimming lessons}}$$

$$\text{XED} = \frac{\frac{120 - 90}{90} \times 100}{\frac{40 - 30}{40} \times 100} = \frac{+33.33\%}{-25\%} = -1.33$$

- The negative coefficient means that the products are complementary products, i.e. the (25%) fall in the price of swimming lessons causes the demand for goggles to increase (by 33.33%). As the XED is 1.33 (a value greater than 1.0) this suggests the two products are strong complements.

Award up to 2 marks for correctly calculating and showing the working out for the XED.

Award up to 2 further marks for the commentary, i.e. the degree to which the fall in the price of private swimming lessons impacts on the demand for goggles.

$$5 \quad \text{XED} = \frac{\frac{60 - 50}{50} \times 100}{\frac{5 - 4.5}{5} \times 100} = \frac{+20\%}{-10\%} = -2.0$$

- This suggests the two products are strong complementary products.

Award 1 mark for the correct answer and 1 mark for showing the working out.

Income elasticity of demand (YED)

$$1 \quad \text{YED} = \frac{\% \Delta \text{Quantity demanded}}{\% \Delta \text{Real income}}$$

$$\text{YED} = \frac{+1\%}{+3\%} = +0.33$$

- This suggests that tea is a normal good (or necessity good).

Award up to 2 marks for the calculation of the YED (correct answer and working out).

Award up to 1 further mark for an appropriate commentary.

- 2 a
- The YED is known to be +0.14 while real income has increased by 3.5%.
 - Substituting the known values into the YED formula gives: $x \div +3.5\% = +0.14$.
 - Hence, $x = +0.49\%$, i.e. the demand for cigarettes has risen by 0.49%.

Award 1 mark for a brief answer that shows some understanding.

Award 2 marks for a clear understanding of what happens to the demand for cigarettes following the increase in real household income.

- b
- As $\text{YED} = +0.14$, the demand for cigarettes has risen by 0.49% following a 3.5% rise in real income, i.e. the demand for cigarettes is income inelastic.
 - This suggests that cigarettes are normal goods (a necessity for people who demand the product).

Award 1 mark for a brief answer that shows some understanding.

Award 2 marks for a clear understanding of why cigarettes are normal goods as the YED is +0.14.

- 3 a
- $\text{YED} = +3.25$ with the percentage change in income expected to be +1%.
 - Hence, this year's sales volume increases by $x \div 1\% = 3.25\%$.
 - $x = 3.25\%$
 - So, sales are expected to be $50,000 \times 1.0325 = 51,625$ units.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b** ■ YED = -6.5 with the percentage change in income expected to be $+1\%$.
- Hence, this year's sales volume falls by $x \div 1\% = -6.5\%$.
- $x = -6.5\%$ (the percentage change in the demand for sausages).
- So, sales are expected to be $2 \text{ million} \times 0.935 = \mathbf{1.87 \text{ million units}}$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

4 ■
$$\text{YED} = \frac{\% \Delta \text{Quantity demanded}}{\% \Delta \text{Household income}}$$

- $\% \Delta \text{Household income} = \frac{\$29,400 - \$28,000}{\$28,000} = +5\%$

- $\% \Delta \text{Quantity demanded} = \frac{8 - 6}{6} = +33.33\%$

- $\text{YED} = \frac{+33.33\%}{+5\%} = \mathbf{+6.67}$

- This suggests that (visits to) the cinema is a luxury good that is highly dependent on the average level of household income in the economy.

Award up to 2 marks for the calculation of the YED (correct answer and working out).

Award up to 1 further mark for an appropriate commentary.

- 5 a** ■ Inferior good: Soft drinks (accept public transportation as an inferior service).
- Luxury good: Domestic holidays.

Award 1 mark for each correctly identified answer, up to the maximum of 2 marks.

- b** Suppliers of domestic holidays gain the most when average income in the economy rises. In this case, a 10% increase in average household income would cause demand for domestic holidays to rise by 13.6%. However, they would also suffer the most during an economic downturn (recession).

Award 1 mark for a brief answer that shows some understanding.

Award 2 marks for a clear understanding of why suppliers of domestic holidays would gain the most.

- c** Providers of soft drinks would gain the most from an economic recession when average household income falls. The demand for soft drinks would increase by 3.3% for each 10% drop in average household income. The demand for public transportation would also increase, but only by 2.2% for each 10% drop in average household income. Hence, suppliers of soft drinks gain the most from an economic recession.

Award 1 mark for a brief answer that shows some understanding.

Award 2 marks for a clear understanding of why suppliers of soft drinks would gain the most.

d ■
$$\text{YED} = \frac{\% \Delta Q_d}{\% \Delta Y}$$

- YED for public transportation = $-0.22 = \frac{x}{+3.5} = \mathbf{-0.77\%}$ change in demand for public transportation

- YED for domestic holidays = $+1.36 = \frac{x}{+3.5} = \mathbf{+4.76\%}$ change in demand for domestic holidays

Award 1 mark for the correct answer and 1 mark for showing the working out.

- e** The YED for petrol (gas) is $+0.25$, i.e. highly income inelastic. This means that the demand for petrol (gas) in the country is largely unaffected by changes in income, i.e. petrol (gas) is a necessity. Thus, the government can tax this without really affecting the quantity demanded, so there is little, if any, knock-on effect on jobs in the petroleum industry. By contrast, demand for domestic holidays is income elastic so taxing these (which raises the price of domestic holidays) would cause a greater than proportional drop in demand. This would have unintended negative consequences on the industry.

Award 1 mark for a brief answer that shows some understanding.

Award 2 marks for a good understanding of why the government is more likely to tax petrol (gas) rather than suppliers of domestic holidays.

Award 3 marks for a good understanding of why the government is more likely to tax petrol (gas) rather than suppliers of domestic holidays, with appropriate use of the data in the table.

Price elasticity of supply (PES)

- 1 ■ $\% \Delta Q_s = \frac{50 - 20}{20} = +150\%$
- $\% \Delta P = \frac{\$30 - \$25}{\$25} = +20\%$
- Hence, $PES = \frac{5\%}{4\%} = +7.5\%$, i.e. supply is highly price elastic.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 2 a ■ Equilibrium occurs when $Q_d = Q_s$, i.e. $100 - 10P = -50 + 20P$.
- $150 = 30P$
- Hence, $P = \$5$.
- At $P = 5$, $Q_d = 100 - 10(5) = 50$ burgers.
- Equally, $Q_s = -50 + 20(5) = 50$ burgers.

Award 1 mark for determining the correct equilibrium price and 1 mark for the correct equilibrium quantity.

Award up to 1 mark for showing the working out.

b

Price (\$ per burger)	Quantity demanded ($Q_d = 100 - 10P$)	Quantity supplied ($Q_s = -50 + 20P$)
3	70	10
4	60	30
5	50	50
6	40	70
7	30	90

Award 1 mark for each correct column completed, up to the maximum of 2 marks.

- c ■ $\% \Delta Q_s = \frac{70 - 50}{50} = +40\%$
- $\% \Delta P = \frac{6 - 5}{5} = +20\%$
- Hence, $PES = 2.0$, i.e. supply is price elastic.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d As the $PES = 2.0$, this means that for every 1% increase in the price, there is a 2% increase in the quantity supplied. This means that supply is relatively price elastic.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for a clear understanding of why the supply is price elastic.

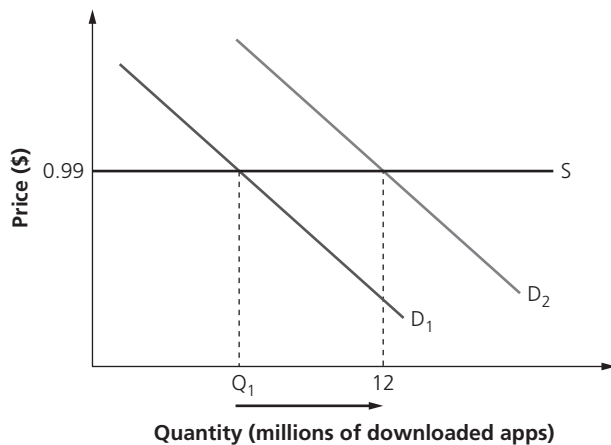
- e ■ Q_d was originally $100 - 10P$.
- As the demand falls by 15 units at all price levels, $Q_d = (100 - 15) - 10P$.
- Hence, $Q_d = 85 - 10P$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- f ■ For equilibrium, $Q_d = Q_s$.
- $85 - 10P = -50 + 20P$
- $135 = 30P$
- Hence, $P = \$4.50$.
- At $P = 4.5$, $Q_d = 85 - 10(4.5) = 40$ burgers.
- Similarly, $Q_s = -50 + 20(4.5) = 40$ burgers.

Award up to 2 marks for the correct answers (calculations) and up to 1 further mark for the working out.

- 3 The supply curve of supplying *Angry Birds* games is perfectly price elastic because Rovio can supply an extra unit of output at zero cost (customers simply download the game's app) as there is no additional cost of production.



Award up to 2 marks for an accurately drawn diagram.

Award up to 2 further marks for a concise commentary of the diagram.

- 4 a ■ $\% \Delta \text{ in Price} = \frac{\$5.40 - \$6}{\$6} = -10\%$
 ■ PES = +1.25, so $\% \Delta Q = -12.5\%$
 ■ Hence, supply falls from 400 to 350 meals per day (a drop of 12.5%), ceteris paribus.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b i 500 handbags

Award 1 mark for identifying the correct number of units.

- ii ■ $\% \Delta Q_s = \frac{800 - 500}{500} = +60\%$
 ■ $\% \Delta P = \frac{8,000 - 2,000}{2,000} = +300\%$
 ■ Hence, PES = +0.2, i.e. supply is highly price inelastic.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- iii The steep supply curve suggests that supply of Chanel luxury handbags is price inelastic, i.e. Chanel cannot easily increase the supply (from 500 to 800 bags) even if the market price increases (from \$2,000 to \$8,000 per handbag). This might be due to the lack of skilled labour, expensive raw materials, time lags in making these luxury handbags and low spare capacity.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for a good understanding of why luxury handbags have a steep supply curve, although there is no use of the data in the diagram.

Award 3 marks for a clear understanding of why luxury handbags have a steep supply curve, with reference to the diagram.

- 5 a ■ $Q_s = -180 + 5P$
 ■ Hence, $P = \frac{-180}{5} = \$36$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b**
- At $P = \$40$, $Q_s = -180 + 5(40) = 20$ units.
 - At $P = \$45$, $Q_s = -180 + 5(45) = 45$ units.
 - $\% \Delta$ in $Q_s = \frac{45 - 20}{20} = 125\%$
 - $\% \Delta$ in Price = $\frac{\$45 - \$40}{\$40} = 12.5\%$
 - Hence, $PES = \frac{125\%}{12.5\%} = +10.0$ i.e. supply is extremely price elastic.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c**
- At $P = \$48$, $Q_{s1} = -180 + 5(48) = 60$ health products.
 - At $P = \$45$, $Q_{s2} = -180 + 5(45) = 45$ health products.
 - $\% \Delta$ in $Q_s = \frac{45 - 60}{60} = -25\%$
 - $\% \Delta$ in Price = $\frac{\$45 - \$48}{\$48} = -6.25\%$
 - Hence, $PES = \frac{-25\%}{-6.25\%} = +4.0$ i.e. supply is highly price elastic.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d** The health product is likely to be mass produced using automated technologies. This means the output of the health product can be changed with relative ease in order to meet changes in the market price of the product.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for a clear understanding of why the PES of the health product is price elastic.

1.3 Government intervention

Indirect taxes/Subsidies/Price controls

- 1 a** Equilibrium exists where demand = supply, i.e. at $P = \$20$ both demand and supply equal 20,000 units.

Award 1 mark for correctly identifying the equilibrium price.

- b** A price ceiling refers to the legal maximum price for a particular good (such as food products) or service (such as health care). It is a form of government intervention designed to protect individuals and households on low incomes as market prices could mean they are unable to afford important goods and services (such as housing).

Award 1 mark for a definition that shows limited understanding.

Award 2 marks for a clear definition that shows good understanding of the term 'price ceiling'.

- c** The minimum price of \$25 means that demand = 15,000 units whereas supply = 24,000 units. Hence, there is excess supply of 9,000 units.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for a clear understanding of the impact of a price floor on the product.

- 2 a**
- At $P = \$4$, both demand and supply equal 6,000 units.
 - Hence, the equilibrium price is \$4.

Award 1 mark for correctly identifying the equilibrium price.

- b** ■ At $P = \$5$, demand = 5,000 units while supply = 7,000 units.
 ■ Hence, the excess supply = **2,000 units**.

Award 1 mark for stating the correct excess supply.

- c** ■ The \$2 per unit tax shifts the supply curve parallel to the left by the vertical distance of the tax.
 ■ Hence, the new supply at each price level now needs to be \$2 more to create willingness and ability to supply, e.g. supply was 3,000 units at \$1 but now needs to be \$3 due to the tax.
 ■ Similarly, 5,000 units were previously supplied at \$3, but to supply the same amount now requires a price of \$5.
 ■ Hence, at \$5, both demand and supply equal 5,000 units, i.e. the new equilibrium price is **\$5**.

Qd	Price (\$)	Qs
3,000	7	7,000
4,000	6	6,000
5,000	5	5,000
6,000	4	4,000
7,000	3	3,000
8,000	2	
9,000	1	

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d** ■ At the equilibrium price of \$5, quantity (output) = 5,000.
 ■ Hence, total tax revenue = $\$2 \times 5,000 = \mathbf{\$10,000}$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- e** Consumers used to pay \$4 but now pay \$5. As the tax per unit is \$2, this means consumers pay **\$1 per unit** of the tax burden.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for a clear understanding of how much of the tax incidence is borne by the consumer.

- 3 a** ■ At $P = \$6$, both demand and supply equal 60,000 units.
 ■ Hence, the equilibrium price is **\$6** and the equilibrium quantity traded is **60,000**.

Award 1 mark for identifying the correct equilibrium price and 1 mark for the equilibrium quantity.

- b** ■ The subsidy enables supply to shift to the right, with the vertical distance between the two supply curves being equal to the per unit subsidy (of \$1).
 ■ Previously, a price of \$6.50 was required to generate supply of 70,000 units.
 ■ Now, with the \$1 per unit subsidy, the same 70,000 units can be supplied at a price of \$5.50.
 ■ Hence, the equilibrium price is now **\$5.50** and equilibrium output is **70,000** units.

Qd	Price (\$)	Qs
30,000	7.5	
40,000	7.0	
50,000	6.5	90,000
60,000	6.0	80,000
70,000	5.5	70,000
80,000	5.0	60,000
90,000	4.5	50,000

Award up to 2 marks for the correct answers and 1 mark for showing the working out.

- c** ■ The per unit subsidy = \$1, and the quantity supplied = 70,000 units.
 ■ Hence, the total cost of providing the subsidy = **\$70,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d** ■ The total subsidy (calculated in the previous question) = \$70,000.
 ■ However, as consumers only received \$0.50 of the \$1 per unit subsidy (they used to pay \$6, but now pay \$5.50), their incidence of the subsidy = **\$35,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 4 a** ■ Per unit tax = \$20 – \$10 (the vertical distance between the two supply curves) = \$10
 ■ Quantity traded = 30,000 units
 ■ Hence, total tax revenue = 30,000 × \$10 = **\$300,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b** ■ Consumers used to pay \$15 but now pay \$20, i.e. an extra \$5 per unit.
 ■ Equilibrium quantity is now 30,000 units.
 ■ Therefore, the total tax burden to consumers = 30,000 × \$5 = **\$150,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c** ■ Consumers used to spend \$15 × 40,000 units = \$600,000.
 ■ They now spend \$20 × 30,000 units = \$600,000.
 ■ Therefore, there is **no change** in total consumer spending after the tax.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d** ■ The dead weight loss is the loss of consumer surplus and producer surplus when price was originally \$15.
 ■ It is equal to the triangular area: $\frac{(\$20 - \$10) \times (40,000 - 30,000)}{2} = \mathbf{\$50,000}$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- e** ■ Producer surplus is the difference between what suppliers received (market price of \$20) compared to the price they were willing and able to supply.
 ■ The new producer surplus is shown by the triangular area above the supply curve, under the horizontal price level.
 ■ Hence, producer surplus = $\frac{(\$20 - \$5) \times 30,000}{2} = \mathbf{\$225,000}$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- f** ■ Previous consumer surplus = $\frac{(\$35 - \$15) \times 40,000}{2} = \$400,000$
 ■ New consumer surplus = $\frac{(\$35 - \$20) \times 30,000}{2} = \$225,000$
 ■ Therefore, the change in consumer surplus = \$400,000 – \$225,000 = **\$175,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 5 a** At the minimum price of \$30, there will be excess supply of 4,000 units. This is because at \$30, supply will be 7,000 units, whereas demand will be only 3,000 units. Thus, a surplus exists due to the price floor.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of the resulting excess supply.

- b** ■ Consumers used to spend \$20 × 5,000 units = \$100,000.
 ■ At the higher price of \$30, they now spend only \$30 × 3,000 = \$90,000.
 ■ Therefore, the change in consumer spending = **–\$10,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c** ■ Producers used to earn \$20 × 5,000 units = \$100,000.
 ■ At the higher price of \$30, they now earn:
 □ From consumers: \$30 × 3,000 = \$90,000.
 □ From the government: \$30 × 4,000 excess supply = \$120,000.
 □ Thus, total earnings are now \$210,000.
 ■ Therefore, the change in producer revenue = **+\$110,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d ■ The total amount spent on buying the excess supply = $\$30 \times 4,000 = \$120,000$.
- If the government exports the excess supply, it receives $\$20 \times 4,000 = \$80,000$.
- Hence, taxpayers have to pay for the difference, i.e. **\\$40,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

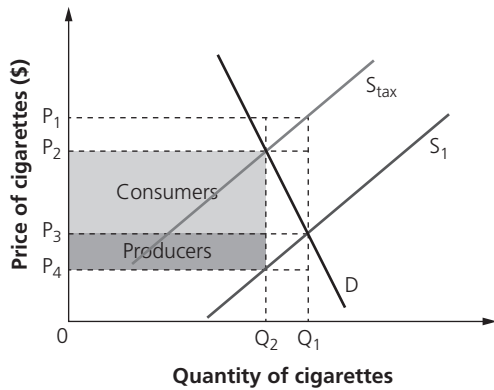
1.4 Market failure

Market failure

1 a The original equilibrium is where $D = S_1$, i.e. P_3 and Q_1 .

Award 1 mark for identifying the correct price and quantity.

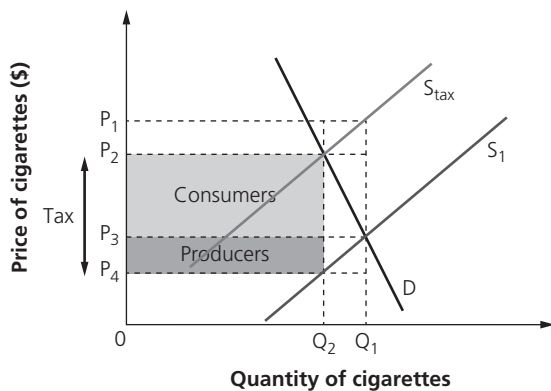
- b ■ Smokers used to pay P_3 in the free market.
- Following the imposition of the tax, they now pay P_2 . Hence, the difference between P_3 and P_2 represents the share of the tax per unit paid by consumers.
- The new quantity traded is Q_2 .
- Hence, the amount of tax paid by consumers/smokers is $(P_2 \text{ minus } P_3) \times Q_2$.



Note: The diagram above is for illustrative purposes only and is not required in the written answer.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c ■ The tax per unit on cigarettes is the vertical distance between the two supply curves, i.e. P_2 to P_4 .
- The new equilibrium quantity is where $D = S_{tax}$, i.e. Q_2 at a price of P_2 .
- Hence, the amount of tax collected by the government = $(P_2 - P_4) \times Q_2$.



Note: The diagram above is for illustrative purposes only and is not required in the written answer.

Award 1 mark for the correct answer and 1 mark for showing the working out.

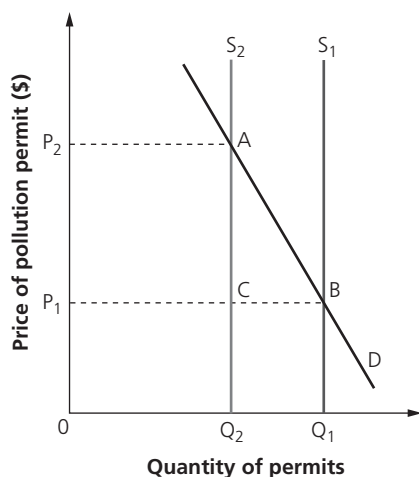
- d Cigarettes are demerit goods as there are negative externalities of consumption, such as passive (second-hand) smoking and litter. Taxing cigarettes, therefore, helps to reduce their consumption, albeit not necessarily to the socially desired level due to the price inelastic nature of the demand for cigarettes.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows clear understanding of why the government might tax the production and/or consumption of cigarettes.

Accept answers that consider the ability of governments to collect large sums of tax revenues by taxing products with price inelastic demand.

- 2 a The permit scheme shifts the supply of pollution permits from S_1 to S_2 . This causes an increase in the price of the pollution permits, creating an incentive for firms to be more efficient and to invest in cleaner technologies.

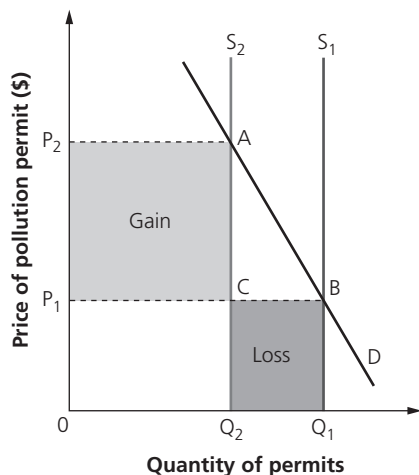


Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows good understanding although the answer lacks clear application of the diagram.

Award 3 marks for an answer that shows good understanding, with accurate application of and reference to the diagram.

- b ■ The revenue increases from OP_1BQ_1 to OP_2AQ_2 due to the relatively price inelastic demand for the pollution permits.
- Alternatively, the government gains the area P_1P_2AC as tax revenue and loses the area Q_2CBQ_1 (although there is a net gain due to the price inelastic demand for the pollution permits).



Note: The diagram above is for illustrative purposes only and is not required in the written answer.

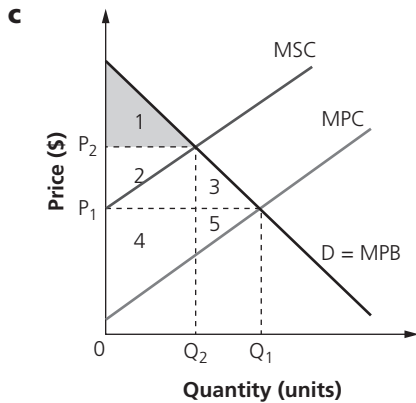
Award 1 mark for the correct answer and 1 mark for showing the working out or explanation.

3 a Consumer surplus is shown by the area above the equilibrium price level (P_1) and below the demand curve. Hence, the answer is the area **1 + 2 + 3**.

Award 1 mark for identifying the correct area of consumer surplus.

b Producer surplus is shown by the area below the equilibrium price level (P_1) and above the supply curve. Hence, the answer is the area **4 + 5**.

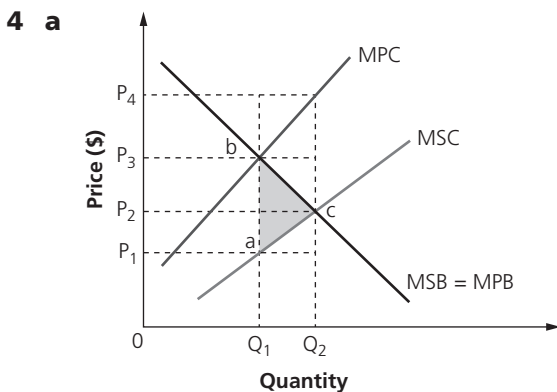
Award 1 mark for identifying the correct area of producer surplus.



The consumer surplus falls to just area 1 due to the carbon tax, which forces the price up from P_1 to P_2 . Hence, consumers lose areas 2 + 3 after the imposition of the carbon tax.

Award 1 mark for correctly drawing the MSC curve.

Award up to 2 further marks for the explanation of the fall in consumer surplus.



The positive externality is shown by the shaded triangle *abc*.

Award 1 mark for shading in the correct area on the diagram.

b The positive externality from production at each level of output is shown by the vertical distance between the MSC and MSB curves, up to the socially optimal level of output at Q_2 .

There are positive externalities of production as $MPC > MSC$, i.e. there is underproduction of R&D from the socially desirable level at Q_2 . Firms operates at Q_1 , so need to be encouraged to expand output to Q_2 where $MSB = MSC$ (at Point c) enabling society to capture the potential welfare gain equal to triangle *abc* in the process.

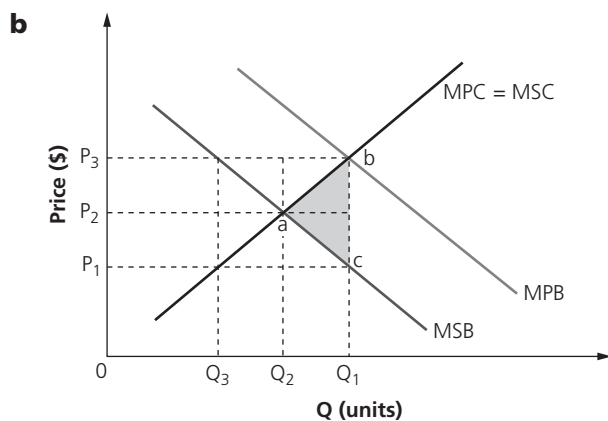
Award 1 mark for an answer that shows limited understanding.

Award 2 marks for an answer that shows clear understanding of why the shaded area (triangle *abc*) represents the value of the positive externality.

5 a Demerit goods are products that create negative spillover effects (or negative externalities) to society, e.g. junk food. The production and consumption of such goods result in social costs being greater than private costs of production and consumption, i.e. $MSC > MPC$ or $MPB > MSB$.

Award 1 mark for an answer that shows limited understanding.

Award 2 marks for a clear definition that shows a good understanding of the term 'demerit good'.



Award 1 mark for shading in the correct area on the diagram.

- c** The consumption of junk food creates negative externalities of consumption (as junk food is a demerit good). As there is consumption of Q_1 units of junk food (where $MPB = MPC = MSC$), excessive consumption of junk food causes detrimental impacts on society, e.g. poor health, obesity and loss of traditional family mealtimes. The socially optimal level of consumption is at Q_2 units, where the $MSB = MPC = MSC$. Hence, the shaded triangle area (abc) represents the welfare loss to society.

Award 1 mark for an answer that shows limited understanding.

Award 2 marks for an answer that shows clear understanding of why the shaded area (triangle abc) represents the value of the negative externality.

1.5 Theory of the firm and market structures (HL only)

Production and costs/Revenues/Profit

- 1 a**
- Total costs = Total fixed costs + Total variable costs
 - $TC = \$10\text{m} + (\$120 \times 22,000) = \mathbf{\$12.64\text{ million}}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b**
- Profit = Total revenue – Total costs
 - $TR = \$800 \times 22,000 = \17.6 m
 - As calculated in Question **1a**, $TC = \$10\text{ m} + (\$120 \times 22,000) = \$12.64\text{ m}$.
 - Hence, profit = $\$17.6\text{ m} - \$12.64\text{ m} = \mathbf{\$4.96\text{ million}}$.

Award 1 mark for the correct answer, and up to 2 further marks for showing the full working out.

- c**
- Average cost = Total cost \div Quantity of output
 - AC at 11,000 units = $[\$10\text{ m} + (\$120 \times 11,000)] \div Q = \$1,029.09$
 - AC at 22,000 units = $[\$10\text{ m} + (\$120 \times 22,000)] \div Q = \574.54
 - Hence, it can be seen that with a greater level of output, average costs tend to fall (economies of scale). In fact, with a selling price of \$800, the firm would make a loss if it only produced and sold 11,000 units of output.

Award 1 mark for the correct answer and 1 mark for showing the working out.

Award up to 2 further marks for the explanation.

- 2 a** $\$15,000$ – this is the cost paid irrespective of the level of output, i.e. when there is no output the firm still needs to pay \$15,000 in fixed costs for items such as rent.

Award 1 mark for stating the correct value of fixed costs.

- b** ■ At 100 kg of output, TC = \$33,000. Fixed costs account for \$15,000 of this total. Hence, the TVC account for \$18,000.
- $AVC = \frac{TVC}{Q} = \$180$

Output (kg)	Total costs (\$)	TVC (\$)	AVC (\$)
0	15,000	0	–
50	25,000	10,000	200
100	33,000	18,000	180
150	39,000	24,000	160

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c** To establish whether STC Inc. enjoys economies of scale, it is important to work out the average total costs (ATC) as the firm increases its output.

Output (kg)	Total costs (\$)	ATC (\$)
0	15,000	–
50	25,000	500
100	33,000	330
150	39,000	260

Hence, it can be seen that as the firm increases its output from 50 kg to 150 kg, the cost per unit falls from \$500 to \$260, i.e. the firm experiences economies of scale.

Award 1 mark for an answer that shows limited understanding.

Award 2 marks for an answer that shows some understanding, although there is limited application of the data in the table.

Award 3 marks for an answer that shows good understanding, with appropriate use of the data in the table.

- 3 a** SIS Ltd. does experience economies of scales (a fall in average costs of production as output increases), as shown in the table below.

Output (kg)	Total costs (\$)	Average costs (\$)
0	200	–
10	280	28.0
20	480	24.0
30	690	23.0
40	900	22.5

The average cost of producing 10 kg of output is $\frac{\$280}{10} = \28.0 . This falls to just \$22.5 per unit as 40 kg of output is produced. Hence, the firm experiences economies of scale.

Award 1 mark for the correct answer and 1 mark for showing the working out.

Award 1 further mark for the commentary, i.e. SIS Ltd. does experience economies of scale.

- b** ■ The average fixed cost (AFC) is calculated as $\frac{TFC}{Q}$, where Q is output. When there is no output, the total costs are \$200, i.e. this represents the fixed costs.
- So, the AFC of producing 20 kg of output = $\frac{200}{20} = \$10$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c ■ The productively efficient level of output occurs when average total costs are minimized, i.e. at 40 units of output when $AC = \$22.5$.

Output (kg)	Total costs (\$)	Average costs (\$)
0	200	–
10	280	28.0
20	480	24.0
30	690	23.0
40	900	22.5

- The average fixed cost (AFC) is calculated as $\frac{TFC}{Q}$, where Q is output. When there is no output, the total costs are \$200, i.e. this represents the fixed costs.
- So, the AFC at the productively efficient level of output = $\frac{200}{40} = \$5$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d ■ The average fixed cost (AFC) is calculated as $\frac{TVC}{Q}$, where Q is output and TVC is the total variable cost.
- As $TC = TFC + TVC$, this means $TVC = TC - TFC$.
- So, the average variable cost (AVC) = $\frac{TC - TFC}{Q}$.
- The AVC of producing 30 kg of output = $\frac{690 - 200}{30} = \$16.33$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 4 a Fixed costs are those that do not directly change with a firm's level of output. For example, Bhardwaj Candles pays the same amount of rent each month, irrespective of how many candles it produces or sells.

Award 1 mark for an accurate explanation of fixed costs.

Award 1 mark for a relevant example of a fixed cost for Bhardwaj Candles.

- b ■ $ATC = \frac{TC}{Q}$ where $TC = TFC + TVC$
- $ATC = [(\$3 \times 2,500) + \$4,000] \div 2,500 = \$4.60$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c $TC = TFC + TVC = \$4,000 + (\$3 \times 2,500) = \$11,500$
- Or
- $TC = ATC \times Q = \$4.6 \times 2,500 = \$11,500$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d ■ Profit = Contribution – Total fixed costs
- Profit = $[(\$6 - \$3) \times 3,000] - \$4,000 = \$5,000$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 5 a Fixed costs do not change proportionately with the level of output. The costs of advertising are fixed for Sharma Curtains Co. as they do not change *because* of the level of output (of curtains).

Award 1 mark for an answer that shows limited understanding.

Award 2 marks for an answer that shows good understanding of why advertising costs are a fixed cost for Sharma Curtains Co.

- b Fixed costs = Advertising + Rent + Salaries = **\$6,700**

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c ■ $TVC = \$15 \times 300 = \$4,500$
 ■ $TFC = \$6,700$
 ■ Hence, $TC = \$11,200$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d ■ $TR = \$50 \times 300 = \$15,000$
 ■ Hence, profit = $\$15,000 - \$11,200 = \$3,800$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

Perfect competition

- 1 a The profit-maximizing level of output for the firm occurs at the point where $MC = MR$ (at Point x), i.e. at an output level of Q_3 .

Award 1 mark for a brief answer that shows limited understanding.

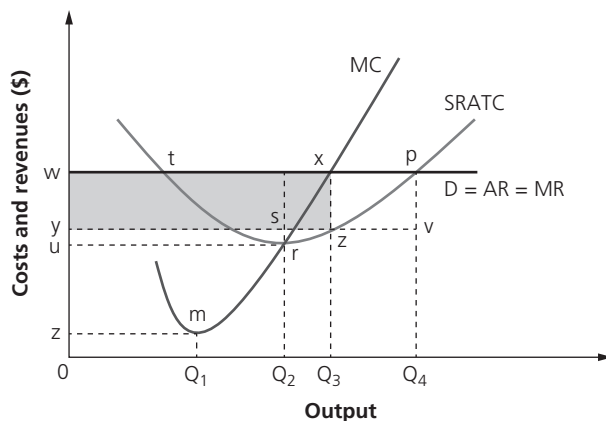
Award 2 marks for an answer that shows a clear understanding of the profit-maximizing level of output.

- b Efficiency is maximized at the lowest point on the firm's SRAC curve, i.e. at an output level of Q_2 . This is because there is allocative efficiency in the economy, where $P = AC$. To the left of Q_2 the firm has further growth opportunities to exploit, such as economies of scale. To the right of Q_2 , the firm experiences diseconomies of scale. Hence, it is most efficient at an output level of Q_2 .

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of the economically efficient level of output.

- c The profit-maximizing firm produces at Q_3 , where $MC = MR$. At this level of output, its price (or average revenue) is w , while its average cost is y . Since, w is greater than y , the firm earns economic profit. The total value of economic profit is equal to the area $wyzx$.



Note: The diagram above is for illustrative purposes only and is not required in the written answer.

Award 1 mark for an answer that shows limited understanding.

Award 2 marks for an answer that shows some understanding, although there is limited application of the diagram.

Award 3 marks for an answer that shows good understanding, with appropriate use of the diagram.

- 2 a To calculate the short-run shut-down price ($P = AVC$), it is necessary to know the average variable cost (AVC) of production:
- Variable costs = Components and materials (\$35,500) plus Wages (\$45,000)
 - $TVC = \$35,500 + \$45,000 = \$80,500$
 - $AVC = \$80,500 \div 500 \text{ units} = \161
 - Hence, the shut-down price = **\$161**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b** To calculate the break-even price ($P = AR = AC$), it is necessary to know the average total cost (ATC) of production:
- $ATC = TC \div Q = (\$35,500 + \$45,000 + \$30,000) \div 500 = \221
 - At a price of \$221 per unit, the $TR = \$221 \times 500 = \$110,500$ and the $TC = \$110,500$.
 - Hence, the break-even price = **\$221**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 3 a** The break-even price occurs when $P(AR) = ATC$, i.e. \$2.5. This is because the price must cover all the costs of production, with the firm making a normal profit in the long run. At a price below \$2.5 (such as covering AVC of \$2), the firm does cover all of its costs, so makes a loss instead.

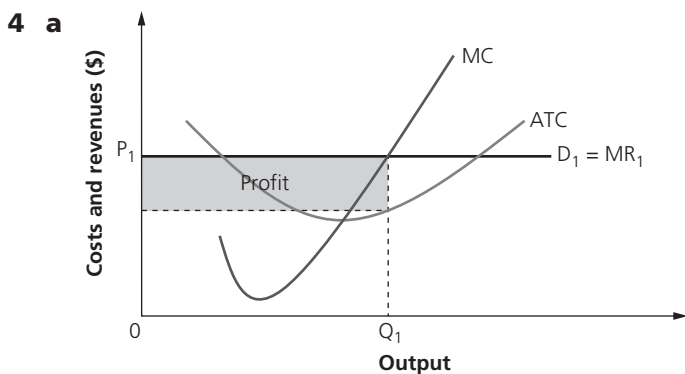
Award 1 mark for the correct answer and 1 mark for the explanation.

- b** Given that the firm is in perfect competition, its demand curve is perfectly price elastic so $AR = MR = \$35$. Given that $MC = ATC$ at ATC 's minimum point, $ATC = \$35$. Hence, the break-even price = \$35 as all costs need to be covered.

The short-run shut-down price is \$30 since all variable costs must be covered in order for the firm to continue producing.

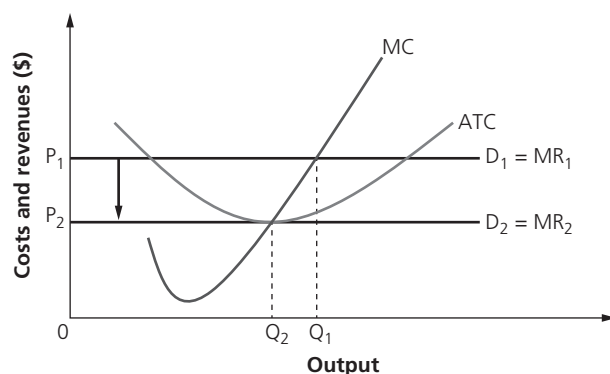
Award 1 mark for each correct answer, up to 2 marks.

Award 1 further mark for the explanation.



Award 1 mark for clearly identifying the correct area that represents profit.

- b** As the industry was making abnormal profits, new entrants eventually force the market price to drop to P_2 , where $MC = AC$. The firm's output drops to Q_2 where the firm makes normal profits at its profit-maximizing level of output (where $MC = MR_2$).



Award up to 2 marks for accurately drawing a fully labelled diagram showing the long-run position of the firm.

Award up to 2 further marks for a full explanation of the diagram.

- 5 a i** $P = \$15$, allowing the firm to break even.

Award 1 mark for identifying the correct long-run shut-down price.

- ii** Output = 33 units, where $MC = MR$.

Award 1 mark for identifying the profit-maximizing output level.

iii $P = \$15$, where ATC is minimized, i.e. $P = MC = AC$.

Award 1 mark for identifying the correct price.

- b**
- $MC = MR$ at 33 units of output, with a price of \$30 per unit
 - ATC at 33 units of output = \$17
 - $TR (AR \times Q) = \$30 \times 33 = \990
 - $TC (ATC \times Q) = \$17 \times 33 = \561
 - Profit = $TR - TC = \$990 - \$561 = \$429$

Alternatively

- Profit = $(AR - ATC) \times Q$
- $(\$30 - \$17) \times 33 = \$429$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c** At a price of \$10, many firms will exit the industry owing to the losses being incurred (since $AC > AR$). Eventually, this causes the market supply to fall, thereby pushing up the market price of the goods until it equals ATC at \$15 (the price which allows firms to earn normal profits).

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of the position of the market in the long run.

- d**
- Normal profit occurs at $P = AR (= MR) = AC (= MC)$.
 - Hence, $P = \$15$ with profit-maximizing output = 28 units.
 - So, normal profit = $\$15 \times 28 = \420 .

Award 1 mark for the correct answer and 1 mark for showing the working out.

Monopoly

- 1 a**
- Profit = $TR - TC$ or $(AR \times Q) - (ATC \times Q)$
 - = $(\$80 \times 25,000) - (\$60 \times 25,000)$
 - = $\$2 \text{ m} - \1.5 m
 - = **\$500,000** (economic profit)

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b** The monopolist can achieve further economies of scale by producing more output. This is because the firm's $MC < ATC$, i.e. average costs, will continue to fall until $MC = ATC$ (the minimum point on the ATC curve).

Award 1 mark for a brief answer that shows limited understanding or an answer that does not refer to the data.

Award 2 marks for an answer that shows a clear understanding of why the monopolist is not productively efficient, with appropriate use of the data.

- c** The profit-maximizing firm will produce at the level of output where $MC = MR$. Currently, $MR > MC$ ($\$40 > \30) for the monopolist so it will increase output to maximize profits.

Award 1 mark for a brief answer that shows limited understanding or an answer that does not refer to the data.

Award 2 marks for an answer that shows a clear understanding of why the profit-maximizing monopolist will increase its output, with appropriate use of the data.

- 2 a** Consumer surplus is shown by the area above the equilibrium price level (P_1) and below the demand curve. Hence, the answer is the area **a + b + c**.

Award 1 mark for correctly identifying the area of consumer surplus.

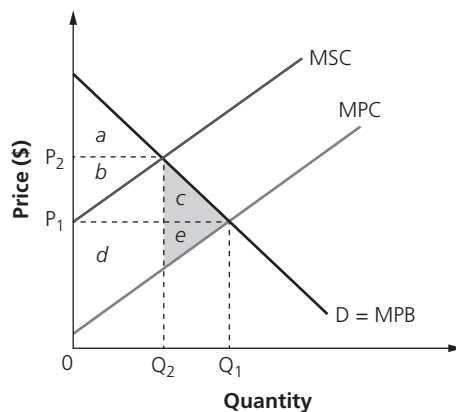
- b** Producer surplus is shown by the area below the equilibrium price level (P_1) and above the supply curve. Hence, the answer is the area **d + e**.

Award 1 mark for correctly identifying the area of producer surplus.

- c** The consumer surplus falls to area **a**. Hence, consumers lose areas $b + c$. However, with price at P_2 , the producer surplus is now area **b + d**.

Award 1 mark for correctly identifying the area of the new consumer surplus, and award 1 mark for correctly identifying the area of the new producer surplus.

- d**
- The original social surplus was the sum of areas $a + b + c$ (consumer surplus) and areas $d + e$ (producer surplus).
 - The new social surplus is area a (consumer surplus) plus area $b + d$ (producer surplus).
 - Hence, the loss in community surplus is the area **c + e** (which represents the deadweight loss to society).



Note: The above is shown for illustrative purposes only and is not required in the written answer.

Award 1 mark for a brief answer that shows limited understanding or an answer with no reference to the diagram.

Award 2 marks for an answer that shows a clear understanding of the loss in social (community) surplus.

- 3 a** The profit-maximizing monopolist produces at the output level where $MC = MR$, i.e. at Point F, or OG output. The price charged at this level of output, as shown on the $AR = D$ curve, is therefore OA.

Award 1 mark for a brief answer that shows limited understanding or an answer with no reference to the diagram.

Award 2 marks for an answer that shows a clear understanding of the price charged by a profit-maximizing monopolist.

- b** The profit-maximizing monopolist produces at OG, where $MC = MR$. The average cost at this level of output is GD (or OB). Hence, the total cost is shown by the area **OBG**.

Award 1 mark for a brief answer that shows limited understanding or an answer with no reference to the diagram.

Award 2 marks for an answer that shows a clear understanding of the total cost for the profit-maximizing monopolist.

- c** The amount of abnormal profit earned by the profit-maximizing monopolist is the difference between its price (OA) and its average cost (OB) multiplied by the amount of output at the profit-maximizing level of output (OG). Hence, the amount of abnormal profit = **ACDB**.

Award 1 mark for a brief answer that shows limited understanding or an answer with no reference to the diagram.

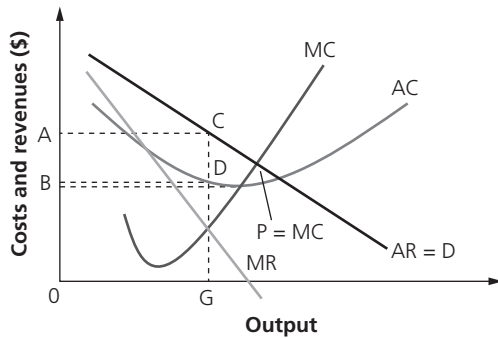
Award 2 marks for an answer that shows a clear understanding of the amount of profit earned by the profit-maximizing monopolist.

- d The revenue-maximizing monopolist will supply output at the level where revenue is fully exploited, i.e. where $MR = 0$. Hence, its output level = **OH**. Any output beyond this point means that MR is negative, so would reduce total revenue.

Award 1 mark for a brief answer that shows limited understanding or an answer with no reference to the diagram.

Award 2 marks for an answer that shows a clear understanding of the level of output for the revenue-maximizing monopolist.

- e The profit-maximizing monopolist will operate at the output level where $MC = MR$, i.e. output level **OG**. There is no incentive for it to operate at the allocative efficient level of output where $P = MC$ owing to the lack of competition. Instead, for the monopolist, $P > MC$.



Note: There is no need to draw the diagram; it has been included above for illustrative purposes only.

Award 1 mark for an answer that shows limited understanding.

Award 2 marks for an answer that shows some understanding, although there is limited application of the data in the table.

Award 3 marks for an answer that shows good understanding, with appropriate use of the data in the table.

4 a

Quantity (units)	Price (\$ per unit)	Total cost (\$)	Total revenue (\$)	Marginal revenue (\$)	Marginal cost (\$)
50	1,700	60,000	85,000	–	–
60	1,600	68,000	96,000	1,100	800
70	1,500	77,000	105,000	900	900
80	1,400	87,000	112,000	700	1000
90	1,300	98,000	117,000	500	1100

The monopolist will operate at the output level where $MC = MR$, i.e. **70 units**.

Award 1 mark for each column that is completed correctly, up to 3 marks.

Award 1 further mark for determining the level of output for the monopolist.

- b ■ At 70 units of output, $TR = 70 \times 1,500 = \$105,000$.
- At 70 units of output, TC is given as $\$77,000$.
- Hence, $\text{profit} = \$105,000 - \$77,000 = \mathbf{\$28,000}$.

Quantity (units)	Price (\$ per unit)	Total cost (\$)	Total revenue (\$)	Profit (\$)
50	1,700	60,000	85,000	25,000
60	1,600	68,000	96,000	28,000
70	1,500	77,000	105,000	28,000
80	1,400	87,000	112,000	25,000
90	1,300	98,000	117,000	19,000

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 5 a** ■ The profit-maximizing monopolist produces at $MC = MR$, i.e. 10,000 units of output and charges \$110 per unit.
 ■ Hence, $TR = \$110 \times 10,000 = \$1,100,000$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b** ■ At $MC = MR$ (10,000 units of output), the $AC = \$70$.
 ■ Hence, $TC = \$70 \times 10,000 = \$700,000$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

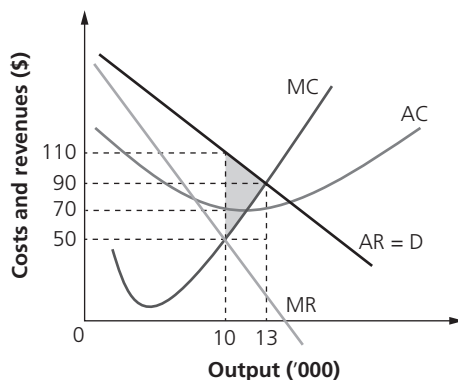
- c** ■ Profit = $TR - TC$
 ■ $\$1,100,000 - \$700,000 = \$400,000$

Apply the own figure rule for this question, based on the answer to Questions 5a and 5b.

Award 1 mark for a brief answer that shows limited understanding or an answer that does not refer to the data given.

Award 2 marks for an answer that clearly shows the abnormal profit earned by the monopolist.

- d** The deadweight loss = loss in consumer and producer surplus due to output of the monopolist being 10,000 instead of the socially optimal output (where $D = S$) at 13,000 units. This is shown by the shaded triangular area in the diagram below.



$$\text{Hence, the deadweight loss} = \frac{(\$110 - \$50) \times (13,000 - 10,000)}{2} = \$90,000.$$

Award 1 mark for the correct answer and 1 mark for showing the working out.

Monopolistic competition

- 1 a** ■ $ATC = \frac{TFC}{Q} + AVC$
 ■ $\frac{\$5,000}{800} + \5.75
 ■ $\$6.25 + \$5.75 = \$12$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b** ■ Profit = $TR - TC$
 ■ $TC = TFC + (AVC \times Q)$
 ■ $TC = \$5,000 + (\$5.75 \times 800) = \$9,600$
 ■ $TR - TC = \$12,800 - \$9,600 = \$3,200$

Alternatively

- Profit = $(AR - ATC) \times Q$
 ■ $(\$16 - \$12) \times 800 = \$3,200$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 2 a** It would be financially beneficial for the firm to increase output. This is because $MR > MC$ ($\$9 > \6), so the firm earns extra profit by raising output (up to the point where $MR = MC$).

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why it would be financially beneficial to increase output.

- b**
- $TR = \$14 \times 6,000 = \$84,000$
 - $TC = \$12 \times 6,000 = \$72,000$
 - Abnormal profit = **$\$12,000$**

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 3 a** The firm, as a profit-maximizer, will operate at the output level where $MC = MR$, i.e. at **8,000 units**.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why the firm operates at 8,000 units.

- b**
- At the profit-maximizing level of output, abnormal profit = $TR - TC$.
 - $TR = \$10 \times 8,000 = \$80,000$
 - $TC = \$6.5 \times 8,000 = \$52,000$
 - Profit = **$\$28,000$**

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c** The presence of abnormal profits will attract new entrants to the market, thereby reducing the equilibrium price. Average revenue (price) will eventually fall to $\$6.5$, when the monopolistically competitive firm earns normal profit.
- At $\$7$, $AR = AC$.
 - $TR = \$7 \times 6,000 = \$42,000$
 - $TC = \$7 \times 6,000 = \$42,000$
 - Profit = **$\$0$** , i.e. normal profit.

Accept answers that suggest the AR becomes tangential to the ATC at $\$6.50$.

- At $\$6.5$, $AR = AC$.
- $TR = \$6.5 \times 8,000 = \$52,000$
- $TC = \$6.5 \times 8,000 = \$52,000$
- Profit = **$\$0$** , i.e. normal profit.

Award 1 mark for the working out that shows $TR = TC$.

Award 1 mark for correct answer.

- 4 a** The profit-maximizing condition is $MC = MR$, so the firm will produce at **Q_2** .

Award 1 mark for identifying the correct level of output.

- b** At the profit-maximizing level of output (Q_2), the price charged is **$0b$** .

Award 1 mark for identifying the correct price.

- c** At the profit-maximizing level of output (Q_2), the price = $0b$ and $ATC = 0c$, so the profit per unit = **bc** .

Award 1 mark for identifying the correct per unit profit.

- d** Abnormal profits attract new entrants to the industry, thus reducing the market price below $0b$. This reduces the abnormal profit until all firms in the industry earn normal profit in the long run.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why the firm only earns normal profit in the long run.

- 5 a At 100 units, the $MC = MR = \$80$. This is the profit-maximizing condition because:
- If $MR > MC$ the firm will continue to produce more as marginal profits will rise.
 - If $MC > MR$ the firm's total profits will fall, so it will reduce its output.
 - Hence, when $MC = MR$ the firm maximizes its profit.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why the firm maximizes profit at $MC = MR$.

- b The firm does not operate under perfect competition. This is because it produces at an output level where $AR > MR$. As $MR < AR$ ($\$80 < \120), the AR (demand) curve is downward sloping. Hence, the firm is operating in a monopolistically competitive industry.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why the given firm does not operate under perfect competition.

- c
- Profit = $TR - TC$
 - $TR = P \times Q = \$120 \times 100 = \$12,000$
 - $TC = ATC \times Q = \$100 \times 100 = \$10,000$
 - Profit = $\$12,000 - \$10,000 = \mathbf{\$2,000}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

Oligopoly

- 1 a **14 units** (as this is where $MC = MR$, the profit-maximizing level of output).

Award 1 mark for identifying the correct level of output.

- b At 14 units of output, the price = **\$8**.

Award 1 mark for identifying the correct price.

- c
- At $MC = MR$, price = $\$8$ and $ATC = \$6$.
 - Hence, the per unit profit = **\$2**.

Award 1 mark for identifying the correct amount of profit per unit.

- d There is price rigidity between the range $MC = \$2$ and $MC = \$5$, where $MC = MR$, thus leaving price to remain unchanged at $\$8$. This is due to the kink in the oligopolist's demand curve that causes a discontinuous MR curve.

Award 1 mark for a brief answer that shows limited understanding or if there is no reference to the data in the diagram.

Award 2 marks for an answer that shows a clear understanding, with appropriate references made to the diagram.

- 2 a Total industry sales = $\$16$ bn

	Firm A	Firm B	Firm C	Firm D	Firm E
Sales	\$2.5 bn	\$3.5 bn	\$2.7 bn	\$3.5 bn	\$3.8 bn
Market share	15.625%	21.875%	16.875%	21.875%	23.75%

The largest 3 firms are Firm E, Firm D and Firm B. Their combined market share forms the 3-firm concentration ratio:

$$23.75\% + 21.875\% + 21.875\% = \mathbf{67.5\%}$$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b** A highly concentrated industry is one where the largest few firms account for a significant market share. In this case, the largest 3 firms account for 67.5% of the industry, so it is quite highly concentrated. In fact, the 4-firm concentration ratio is over 84% and there are only 5 firms in the industry accounting for 100% of the market share.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why the industry is highly concentrated.

- 3 a** Game theory is a model used by economists to predict how oligopolistic firms will react in given scenarios. It is used to explain why collusive oligopoly is likely to break down in the long run, with self-interest driving these firms to abandon any collusive agreement.

Award 1 mark for a definition that shows limited understanding.

Award 2 marks for a clear definition that shows a good understanding of the term 'game theory'.

- b** The dominant strategy for Adidas and Nike is to collude and raise prices together (**Decision A**). This would yield both firms \$50 million each.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of the dominant outcome.

- c** If Adidas opts for a high-price strategy, Nike will earn \$60 million by adopting a low-price strategy (**Decision C**). The opposite applies for **Decision B**. Therefore, independent decision making by Adidas and Nike, due to a lack of trust, is likely to lead to a sub-optimal outcome for both firms (**Decision D**). Collusion is also illegal, of course, in most countries.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why Decision D is the most probable outcome.

- 4 a** A collusive oligopoly occurs when there is agreement between two or more oligopolistic firms to limit competition by restrictive trade practices, such as price fixing or collectively limiting output. A cartel is formed between the colluding firms, thereby effectively acting as a monopolist.

Award 1 mark for a definition that shows limited understanding.

Award 2 marks for a clear definition that shows a good understanding of the term 'collusive oligopoly'.

- b** Firms in a collusive oligopoly behave as though they are a monopoly, resulting in profit maximization at $MC = MR$. Equilibrium, therefore, occurs at an output level of Q_1 , with the firm charging the 'cartel' price of P_3 .

Award 1 mark for a brief answer that shows limited understanding or there is no reference to the diagram.

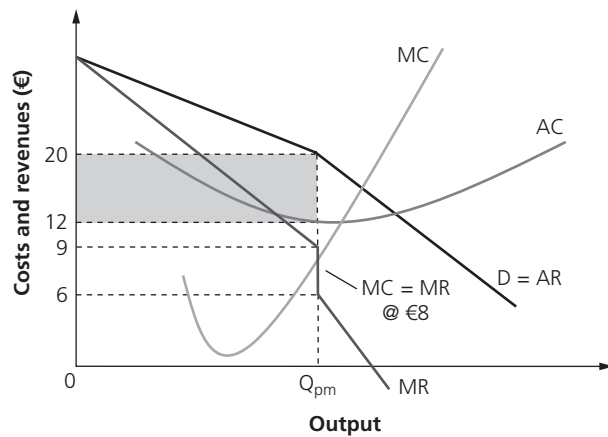
Award 2 marks for an answer that shows a clear understanding of the equilibrium position of the oligopolistic firm, with appropriate reference to the diagram.

- 5 a** The firm does earn abnormal profit as $P (= AR) > ATC$ ($\text{€}20 > \text{€}12$). Hence, it earns $\text{€}8$ per unit sold. The total amount of abnormal profit earned depends on how many units the oligopolist sells.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why the firm earns abnormal profit.

- b** In a non-collusive oligopoly, it is assumed there is asymmetric information and price rigidity (the kinked demand curve theory). Hence, even with a small change in MC, the discontinuous MR curve means that $MC = MR$ within a certain price range, so the firm will keep its price stable at €20 per unit.



Note: The diagram above is for illustrative purposes only and is not required in the written answer.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why there is price rigidity.

Section 2 Macroeconomics

2.1 The level of overall economic activity

Economic activity/The business cycle

- 1 ■ $GDP = C + I + G + (X - M)$
- $GDP = 150 + 60 + 55 + (31 - 28) = \text{\$268 billion}$
 - Apply the formula $GNP = GDP + \text{Net property income from abroad}$.
 - Hence, $GNP = GDP + (-8) = \text{\$260 billion}$.

Award 1 mark for correctly calculating the GDP and 1 mark for correctly calculating the GNP.

Award 1 mark for showing the working out.

- 2 a To calculate the real GDP in 2014, deflate the nominal GDP by the GDP deflator for that year:

$$\frac{230.2}{107.8} \times 100 = \text{\$213.54 bn}$$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b To calculate the average real income in 2015, deflate the nominal salary by the GDP deflator for that year:

$$\frac{\text{\$24,000}}{109.8} \times 100 = \text{\$21,857.92 or } \text{\$21,858}$$

Award 1 mark for the correct answer and 1 mark for showing the working out.

c

Year	Nominal GDP (\$bn)	GDP deflator	Real GDP (\$bn)
2013	228.0	106.0	215.09
2014	230.2	107.8	213.54
2015	232.4	109.8	211.66

- Nominal GDP increases by less than 1% between 2013 and 2014 but inflation rises by more than 1.69%.
- Nominal GDP increases by less than 1% between 2014 and 2015 but inflation rises by more than 1.85%.
- Hence, although nominal GDP has increased by \$4.4 bn, the effects of inflation have eroded the real value of GDP in Country G from \$215.09 bn in 2013 to \$211.66 bn in 2015.

Award 1 mark for an answer that shows limited understanding.

Award 2 marks for an answer that shows some understanding, although there is limited use of the data in the table.

Award 3 marks for an answer that shows good understanding, with effective use of the data in the table.

- 3 a ■ $GDP = C + I + G + (X - M)$
- $GDP = 363 + 159 + 195 + (96 - 123) = \text{\text{€}690 billion}$
 - Export earnings (X) = 96
 - Government expenditure (G) = 195
 - Household consumption (C) = 363
 - Import expenditure (M) = 123
 - Net property income = 58
 - Private-sector investments (I) = 159

Note: Net property income is not required to calculate GDP.

Award 1 mark for the correct answer and 1 mark for showing the working out.

$$\mathbf{b} \quad \frac{\text{€}690 \text{ bn}}{106.2} \times 100 = \text{€}649.71 \text{ bn}$$

Award 1 mark for the correct answer and 1 mark for showing the working out.

$$\mathbf{c} \quad \frac{\text{€}640.25 \text{ bn} - \text{€}649.71 \text{ bn}}{\text{€}649.71 \text{ bn}} \times 100 = -1.46\%$$

- Real GDP has fallen by approximately 1.5%, i.e. the level of economic activity has shrunk.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 4 a**
- The expenditure approach = $C + I + G + (X - M)$.
 - Hence, Wages and salaries and Interest, profits and dividends are not required in the calculation.
 - In 2014, nominal GDP = $80 + 40 + 30 + (35 - 40) = \text{\$}145 \text{ billion}$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b**
- To calculate the economic growth rate, the nominal GDP for 2015 is needed.
 - In 2015, nominal GDP = $85 + 38 + 33 + (40 - 36) = \text{\$}160 \text{ billion}$.
 - Hence, economic growth = percentage change in nominal GDP between 2014 and 2015:

$$\frac{\text{\$}160 \text{ bn} - \text{\$}145 \text{ bn}}{\text{\$}145 \text{ bn}} = 10.34\%$$

Award 1 mark for the correct answer and 2 marks for showing the working out (including the calculation of nominal GDP in 2015).

- c** Possible limitations could include:
- Real GDP is a better indicator of economic growth as the figures are adjusted for the effects of inflation, i.e. nominal GDP does not show changes in real national output.
 - GDP figures, nominal or real, do not show the distribution of income and wealth in the economy, so indications of the level of economic activity may be biased.
 - Similarly, GDP figures do not show the composition of national output in Country S, e.g. in some countries, a very high proportion of nominal GDP is accounted for by military expenditure which does not directly increase the overall level of economic activity for the mass population.
 - There are also complications with grey or parallel markets (such as non-monetary exchanges between economic entities, Do-It-Yourself production, and second-hand sales) and black markets (the illegal trade in goods and services), all of which are not recorded in official GDP calculations.

Award up to 2 marks for explaining each limitation, up to the maximum of 4 marks.

5 a

- $\text{GDP} = C + I + G + (X - M)$
- $= 231 + 148 + 98 + (24 - 37)$
- $= \text{\$}464 \text{ bn}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

b

- $\text{Injections} = I + G + X$
- $= 148 + 98 + 24$
- $= \text{\$}270 \text{ bn}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c**
- $\text{Leakages} = 37 + 88 + 112 = \text{\$}237 \text{ billion}$
 - $\text{Injections} = \text{\$}270 \text{ billion}$
 - Hence, the economy is expanding as $J > W$ by $\text{\$}33 \text{ billion}$.

Award 1 mark for an answer that shows limited understanding.

Award 2 marks for an answer that shows some understanding, although there is limited application of the data in the table.

Award 3 marks for an answer that shows good understanding, with effective use of the data in the table.

- d**
- National income equilibrium exists when Injections (J) = Withdrawals (W).
 - As $J = \text{\$}270 \text{ bn}$, $W = \text{\$}270 \text{ bn}$.

Award 1 mark for identifying the correct value of withdrawals.

- e ■ Government spending = \$98 billion.
- Taxation (government revenue) = \$112 billion.
- Hence, the government has a budget surplus, i.e. \$112 bn – \$98 bn = **\$14 billion**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- f ■ The external deficit $(X - M) = 24 - 37 = -\$13$ bn
- GDP = \$464 bn
- Hence, the external deficit as a percentage of GDP = $\frac{-\$13 \text{ bn}}{\$464 \text{ bn}} = 2.8\%$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

2.2 Aggregate demand and aggregate supply

Aggregate demand (AD)/Aggregate supply (AS)/Equilibrium

1 Possible answers include:

- lower taxes, thus increasing disposable incomes and consumption expenditure (C)
- greater capital investment spending (I)
- increased government spending (G)
- lower interest rates, which increases AD at all price levels
- lower exchange rates, which improves net exports $(X - M)$.

Award up to 2 marks for explaining each reason, up to the maximum of 4 marks.

- 2 a The Keynesian multiplier (k) shows that any increase in the value of injections (or withdrawals) results in an even greater increase (or decrease) in the value of national income. In the case of a positive multiplier, it measures the number of times the final increase in national income (GDP) exceeds the initial increase in expenditure that caused it.

The formula used to calculate the Keynesian multiplier is: $\frac{1}{\text{MPS} + \text{MPT} + \text{MPM}}$ or $\frac{1}{1 - \text{MPC}}$,

where MPC = Marginal propensity of consumption, i.e. the additional consumption in an economy from additional national income earned.

The higher the MPC, the higher the value of the Keynesian multiplier. By contrast, the higher the value of withdrawals (savings, tax and imports), the lower the Keynesian multiplier.

Award 1 mark for a definition that shows limited understanding.

Award 2 marks for a clear definition that shows a good understanding of the term 'Keynesian multiplier'.

Award 1 mark for the correct formula.

- b ■ Multiplier = $\frac{1}{\text{MPS} + \text{MPT} + \text{MPM}} = \frac{1}{\text{MPW}}$
- $k = \frac{1}{0.2 + 0.15 + 0.1} = \frac{1}{0.45} = 2.22$
- Hence, change in national income = \$600 million \times 2.22 = **\$1.332 billion**.

Award 1 mark for calculating the value of the Keynesian multiplier.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 3 a Y_2 , where LRAS = AD₂.

Award 1 mark for identifying the correct level of real national output.

- b As there is a shortfall of actual output (Y_1) from the economy's potential output (Y_2), there is a deflationary gap (as shown by the horizontal distance $Y_1 - Y_2$).

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why the country is experiencing a deflationary gap.

- c The government could close the recessionary gap by boosting aggregate demand from AD_1 to AD_2 using:
- expansionary fiscal policies, e.g. increased government spending and/or lower taxes
 - loose monetary policies, e.g. lower interest rates and increased access to credit.

Award up to 2 marks for explaining each method, up to the maximum of 4 marks.

- d Any factor that causes an increase in the quantity and/or quality of the factors of production, such as:
- improved technology
 - improved infrastructure
 - discovery of resources
 - improved human capital (from education and training).

Award up to 2 marks for each cause of an outwards shift of the country's LRAS curve, up to a maximum of 4 marks.

4 a ■ $k = \frac{1}{1 - MPC} = \frac{1}{MPM + MPS + MPT} = \frac{1}{MPW}$

- $\frac{1}{1 - 0.85} = \frac{1}{0.15}$
- $MPW = 0.15$

Award 1 mark for the correct answer and 1 mark for showing the working out.

b ■ The Keynesian multiplier = $\frac{1}{1 - MPC}$

- $\frac{1}{1 - 0.85} = 6.67$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c The country's real national income increases by $\$200\text{m} \times 6.67 = \mathbf{\$1.334\text{ billion}}$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d ■ The required government expenditure (injection) = $\Delta G \times (1 - MPC)$
- $= 92 \times (1 - 0.85) = \mathbf{\$13.8\text{ billion}}$

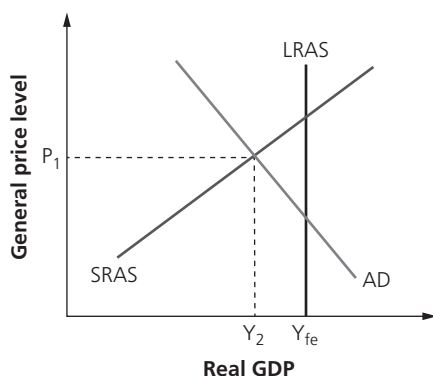
Award 1 mark for the correct answer and 1 mark for showing the working out.

- 5 a As the aggregate supply (AS) curve is perfectly price elastic at low levels of national income (in the Keynesian model), an increase in AD will cause an increase in the level of real national output without any corresponding rise in the price level. This is due to the existence of spare capacity in the economy, such as unemployed resources, allowing real GDP to increase without there being any inflation.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of the likely impact on the economy.

- b The recessionary or negative output gap can be shown as the difference between the full employment equilibrium level of output (Y_{fe}) and actual level of output (Y_2). The negative output gap can be clearly shown in the Keynesian model as the horizontal distance between Y_{fe} and Y_2 .

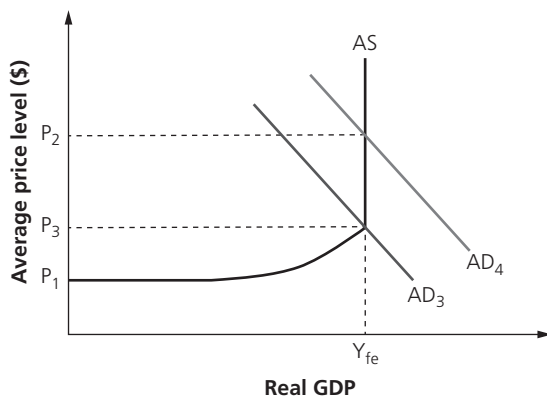


Note: The above diagram is for illustrative purposes only and is not required in the written answer.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why the economy experiences a recessionary gap.

- c An inflationary gap exists if actual national output exceeds the full employment level of output, i.e. aggregate demand increases along the vertical section of the LRAS curve. Increases in aggregate demand beyond AD_3 , at the full employment level of output, are purely inflationary. This causes the equilibrium price level to exceed P_e yet does not contribute to any increases in the full employment level of output, which remains at Y_{fe} .



Note: There is no need to draw a diagram – this has been included for illustrative purposes only.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why the inflationary gap might occur.

2.3 Macroeconomic objectives

Low unemployment

- 1 The total number of people classified as unemployed = 6.8% of 35 million (not everyone of working age is willing and able to work) = **2.38 million**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 2 a First, calculate the size of the labour force:
- Employed population = 76.2% of 80 million = 60.96 million
 - Unemployed population = 12.2 million
 - Labour force = 60.96 m + 12.2 m = 73.16 million

Then use this figure to calculate the unemployment rate:

- $12.2 \text{ m} \div 73.16 \text{ m} = \mathbf{16.68\%}$

Award 1 mark for the correct answer.

Award up to 2 marks for showing the full working out.

- b
- The number of unemployed people remains the same at 12.2 million.
 - However, the labour force increases by 2 million to 75.16 million.
 - Hence, the unemployment rate falls to $\frac{12.2 \text{ m}}{75.16 \text{ m}} = \mathbf{16.23\%}$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 3 a** Underemployment occurs when those who are willing and able to work full time can only secure part-time employment owing to a skills mismatch and/or an economic downturn. By contrast, unemployment occurs when those who are able and willing to work at the going wage rate cannot find any employment. While underemployment results in a loss of potential output, unemployment is more severe as it refers to unused factors of production.

Award 1 mark for an answer that shows limited understanding.

Award 2 marks for an answer that shows some understanding, although the distinction is not made explicitly.

Award 3 marks for an answer that shows good understanding, with the difference clearly explained.

- b** Possible reasons could include an explanation of the following:
- Employment helps to raise living standards for the average person in the economy.
 - Employment has positive impacts on economic growth (another macroeconomic objective), especially as increased consumption expenditure will have positive multiplier effects on the economy.
 - Increased tax revenues, e.g. income tax and sales taxes, mean that firms earning more profits from the improved economy will also pay more corporate taxes.
 - The fiscal burden on the government is reduced due to lower spending on welfare benefits.
 - There are reduced social burdens, e.g. homelessness, marriage and family breakdowns, crime and so forth.
 - It prevents the economy suffering from a 'brain drain' (loss of skills) due to skilled workers leaving the economy to seek employment in other countries.

Award up to 2 marks for explaining each reason, up to the maximum of 4 marks.

- 4 a** Actual output in the economy could increase due to lower unemployment and economic growth and/or better use of Country P's resources.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of how the economy might move towards its productive capacity on the PPC.

- b** Possible answers could include:
- increased productive capacity of the economy
 - improved quality of factors of production, such as education and training of the workforce in Country P
 - discovery of new resources in Country P.

Award 1 mark for each correctly identified cause, up to the maximum of 2 marks.

- 5 a** ■ Labour force = Number unemployed + Number employed
 ■ = 10.81 m + 62.35 m = **73.16 million people**

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b** ■ The Labour force participation rate = $\frac{\text{Labour force}}{\text{Adult population}} \times 100$
 ■ = $\frac{73.16\text{m}}{94\text{m}} \times 100 = \mathbf{77.83\%}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c** ■ The Rate of unemployment = $\frac{\text{Unemployed}}{\text{Labour force}}$
 ■ = $\frac{10.81\text{m}}{73.16\text{m}} \times 100 = \mathbf{14.77\%}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

Low and stable inflation

- 1 The weighted price index is found by calculating the sum of each item of expenditure multiplied by its statistical weighting.

Item of expenditure	This year's price index	Statistical weighting	Weighted price index
Housing	155.3	0.305	47.37
Food	113.4	0.250	28.35
Travel	125.2	0.225	28.17
Clothing	131.6	0.115	15.13
Entertainment	142.5	0.105	14.96
			133.98

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 2 The inflation rate has dropped from over 0.2% in January 2014 to below -1% in early 2015. There have generally been periods of deflation during most of the period shown, i.e. the general price level in Spain was falling.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of deflation occurring.

3

	Year 1	Year 2	%Δ
Income (\$)	\$34,600	\$36,849	6.5%
CPI	132.5	143.1	8.0%

The individual's income has increased by 6.5% while the inflation rate has risen by 8%. This means the individual is likely to be worse off, *ceteris paribus*, as real income has fallen by around 1.5%.

Award 1 mark for an answer that shows limited understanding.

Award 2 marks for an answer that shows some understanding, although there is limited application of the data in the table.

Award 3 marks for an answer that shows good understanding, with appropriate use of the data in the table.

4 a

Year	Price of alphas	Price of betas	Price of gammas	Price of deltas	Total cost of basket	Weighted price index
1	\$4(5) = \$20	\$4.90(3) = \$14.70	\$6(2) = \$12	\$5(4) = \$20	\$66.70	$(66.7 / 69) \times 100 = \mathbf{96.67}$
2	\$4(5) = \$20	\$5.20(3) = \$15.60	\$6.10(2) = \$12.20	\$5.30(4) = \$21.20	\$69.00	$(69 / 69) \times 100 = \mathbf{100.0}$
3	\$4.50(5) = \$22.5	\$5.50(3) = \$16.5	\$6.50(2) = \$13	\$5.50(4) = \$22	\$74.00	$(74 / 69) \times 100 = \mathbf{107.25}$

Award 1–2 marks for an answer that shows some understanding, but contains a few errors/omissions.

Award 3–4 marks for an answer that shows the full working out, with accurate answers. Award 3 marks if there is no more than one error/omission.

- b As the CPI in Year 3 is 107.25, the inflation rate = **7.25%**.

Award 1 mark for determining the correct inflation rate.

- c To calculate the inflation rate in Year 2, calculate the percentage change in the weighted price index between Year 1 and Year 2:

$$\frac{100 - 96.67}{96.67} \times 100 = \mathbf{3\%}$$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 5 a ■ A retail prices index (RPI) is used to calculate the rate of inflation in a country.
- Unlike the CPI, the RPI includes the cost of housing (including mortgage interest payments and other housing costs).
 - It excludes low-income pensioner households and very high-income households, as neither are regarded as being 'average' households in the economy.

Award 1 mark for a definition that shows limited understanding.

Award 2 marks for a clear definition that shows a good understanding of the term 'RPI'.

- b The weight for food is 30 while it is 15 for clothing, i.e. the typical household spends 30% of its income on food costs, and just 15% on clothing. Hence, the average household in Satcolbe spends more money on food than it does on clothing.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why food has a bigger weighting in the RPI.

c

Item	Retail price index	Weight	Weighted retail prices index
Clothing	120	15	$120 \times 0.15 = 18$
Food	130	30	$130 \times 0.3 = 39$
Housing	140	40	$140 \times 0.4 = 56$
Others	125	15	$125 \times 0.15 = 18.75$
Weighted RPI		100	131.75

Award 1 mark for the correct answer, and up to 2 further marks for showing the full working out.

Economic growth

- 1 a ■ Real GDP = (Nominal GDP ÷ GDP deflator) × 100
- $(118.6 \div 103.2) \times 100 = \mathbf{114.9}$

Year	Nominal GDP (\$bn)	GDP deflator	Real GDP (\$bn)
2013	115.0	100.0	115.0
2014	118.6	103.5	114.9
2015	122.8	105.0	116.4

Note: The above table is for illustrative purposes only and is not required in the written answer.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b The nominal economic growth rate is calculated by working out the percentage change in nominal GDP between two years. So, in 2014, the nominal economic growth rate is:

$$[(118.6 - 115.0) \div 115.0] \times 100 = \mathbf{3.13\%}$$

Year	Nominal GDP (\$bn)	Nominal growth rate (%)
2013	115.0	–
2014	118.6	3.13
2015	122.8	3.54

Note: The above table is for illustrative purposes only and is not required in the written answer.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c Real GDP has fallen slightly from \$115 bn in 2013 to \$114.9 bn in 2014. This is because while the nominal GDP has increased by \$3.6 bn, this represents only a 3.13% rise, whereas the rate of inflation is higher at 3.2% (the difference in the GDP deflator, i.e. $103.2 - 100.0$).

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why real GDP fell.

- d The real economic growth rate is calculated by working out the percentage change in real GDP between two years. So, in 2015, the real economic growth rate is:

$$[(116.4 - 114.9) \div 114.9] \times 100 = 1.3\%$$

Year	Nominal GDP (\$bn)	GDP deflator	Real GDP (\$bn)	Growth rate (%)
2013	115.0	100.0	115.0	–
2014	118.6	103.2	114.9	–0.08
2015	122.8	105.5	116.4	1.30

Note: The above table is for illustrative purposes only and is not required in the written answer.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 2 a ■ Real GDP = (Nominal GDP ÷ GDP deflator) × 100
 ■ Real GDP in 2014 = (280 ÷ 105.4) × 100 = **\$265.65 bn**

Award 1 mark for the correct answer and 1 mark for showing the working out.

b

Year	Nominal GDP (\$bn)	GDP deflator
2012	250	102.2
2013	260	100.0

- In 2012, real GDP = (250 ÷ 102.2) × 100 = \$244.6 bn.
- In 2013, real GDP = nominal GDP = \$260 bn.
- So, although the nominal GDP increased by \$10 bn, in real terms GDP had actually increased by a greater amount of **\$15.4 bn** due to the lower price level in 2013.

Award 1 mark for the correct answer, and up to 2 further marks for showing the full working out.

c GDP per capita = $\frac{\$320 \text{ bn}}{62 \text{ m}} = \mathbf{\$5,161}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

3 a

Year	Real national output (\$bn)	Nominal ΔGDP (\$bn)
2011	106.01	
2012	115.93	9.92
2013	135.53	19.6
2014	155.82	20.29
2015	171.39	15.57

Vietnam's nominal GDP increased the most in **2014** when it grew from \$135.53 bn to \$155.82 bn, a gain of \$20.29 bn.

Award 1 mark for the correct working out.

Award 1 mark for the correct answer.

b Annual rate of growth = $\frac{\text{Nominal GDP in a year} - \text{Nominal GDP of previous year}}{\text{Nominal GDP of previous year}} \times 100$

In this case, Vietnam experienced its highest growth rate in **2013** when GDP grew from \$115.93 bn to \$135.53 bn, i.e. a gain of 16.91%.

Year	Real national output (\$bn)	Growth rate (%)
2011	106.01	
2012	115.93	9.36
2013	135.53	16.91
2014	155.82	14.97
2015	171.39	9.99

Award 1 mark for the correct working out.

Award 1 mark for the correct answer.

4 a

Economic variable	2014 (\$bn)	2015 (\$bn)
Capital consumption	7	9
Consumption (C)	85	90
Export earnings (X)	32	30
Government spending (G)	38	38
Import expenditure (M)	28	32
Interest, profit and dividends	9	7
Investments (I)	30	35

- Nominal GDP (expenditure approach) in 2014 = $C + I + G + (X - M)$
 $= 85 + 30 + 38 + (32 - 28) = \text{\$157 billion}$
- Nominal GDP (expenditure approach) in 2015 = $C + I + G + (X - M)$
 $= 90 + 35 + 38 + (30 - 32) = \text{\$161 billion}$

Award 1 mark for the correct answers, and up to 2 further marks for showing the full working out.

- b ■ The economic growth rate is found by calculating the percentage change in the nominal GDP in 2014 and 2015.
- $\frac{\$161 \text{ bn} - \$157 \text{ bn}}{\$157 \text{ bn}} \times 100 = \text{+2.54\%}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c ■ Real GDP = $\frac{\text{Nominal GDP}}{\text{Inflation index}}$
- $= \frac{\$161 \text{ bn}}{107.6} \times 102.5 = \text{\$153.37 bn}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 5 a ■ Nominal GDP = $C + I + G + (X - M)$
- $= 105 + 56 + 35 + (45 - 56) = \text{\$185 bn}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b ■ GNP (or GNI) = GDP + Net property income from abroad (NPIA)
- NPIA = Income earned from assets abroad – Income paid to foreign owners of assets in home country
 - GNP = $\$185 \text{ bn} + \$10 \text{ bn} - \$25 \text{ bn} = \text{\$170 bn}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

Equity in the distribution of income

- 1 a ■ The taxable allowance is the maximum amount that an individual can earn before being liable for tax.
- In this case, the taxable allowance is **\\$10,000**.

Award 1 mark for identifying the correct amount of taxable allowance.

b

Income tier	Income tier (\$)	Tax rate (%)	Tax paid (\$)
\$10,000	10,000	0	0
\$10,001–\$25,000	15,000	10	1,500
\$25,001–\$45,000	20,000	20	4,000
\$45,001 and above	5,000	45	2,250
Total	50,000		7,750

Award 1 mark for the correct answer and up to 2 marks for showing the full working out.

- c** ■ Average tax rate = (Amount of tax paid ÷ Total income) × 100
 ■ So, $(\$7,750 \div \$50,000) \times 100 = 15.5\%$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 2** ■ Marginal rate of indirect tax = $\frac{\text{Change in indirect tax}}{\text{Change in income}} \times 100\%$
 ■ Change in income = $\$25,000 \times 25\% = +\$1,875$
 ■ Marginal rate of indirect tax = $\frac{\$3,493.75 - \$3,250}{\$1,875} = \frac{\$243.75}{\$1,875} \times 100\% = 13\%$

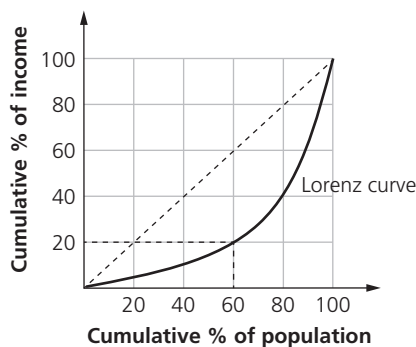
Award 1 mark for the correct answer and 1 mark for showing the working out.

- 3 a** The 45-degree line shows perfect income equality, if it were to exist in Country W, e.g. 60% of the population accounts for 60% of the country's national income.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of the line of perfect income equality.

- b** The third quintile (60%) of the population in Country W accounts for 20% of the national income.



Award 1 mark for the correct answer and 1 mark for the explanation.

4 a

Income bracket	Tax band	Tax payable (\$)	Tax bracket income	Cumulative income (\$)
\$0–\$15,000	5%	750	15,000	15,000
\$15,001–\$35,000	12%	2,400	20,000	35,000
\$35,001–\$70,000	15%	5,250	35,000	70,000
\$70,001+	20%	1,527	7,635	77,635
Total		9,927	77,635	

Total amount of tax payable by the individual = **\$9,927**.

Award 1 mark for the correct answer and up to 2 further marks for showing the full working out.

- b** ■ Average rate of tax = $\frac{\text{Taxable income}}{\text{Personal income}}$
 ■ $= (\$9,927 \div \$77,635) = 12.78\%$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 5 a** The bottom 40% of income earners in Country N earn a lower proportion of national income (16%) than the bottom 40% of income earners in Country J (who account for 24%, or almost a quarter, of its GDP).

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of the second quintile in Country N earning a lower proportion of GDP.

- b** The fifth quintile refers to the proportion of national output accounted for by the highest 20% of income earners. In Country J, the fifth quintile earn four times as much as the bottom 20% of income earners. In Country N, the fifth quintile earn eight times as much (as the bottom 20% of income earners). Hence, there is far greater income inequality in Country N if we use this measure. Indeed, almost half of the nation's income is accounted for by the top 20% of earners in the country.

Award 1 mark for a brief answer that shows limited understanding.

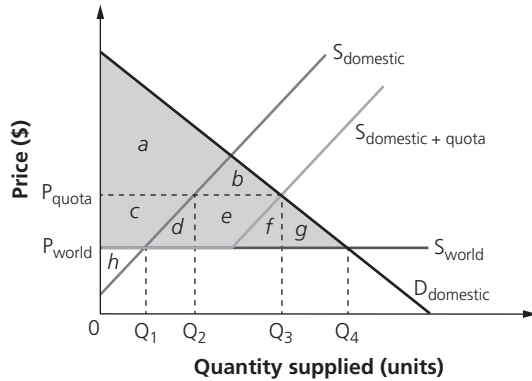
Award 2 marks for an answer that shows a clear understanding of greater income inequality in Country N.

Section 3 International economics

3.1 International trade

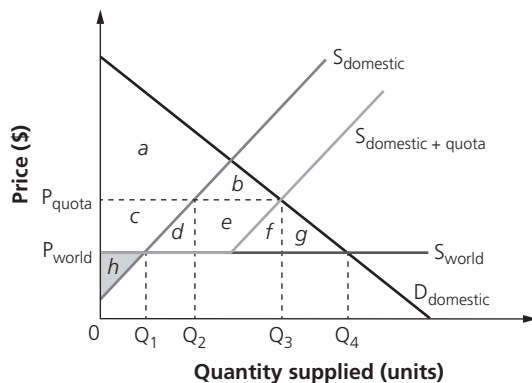
Free trade/Restrictions on free trade: Trade protection

1 a Consumer surplus before the imposition of the quota = $a + b + c + d + e + f + g$.



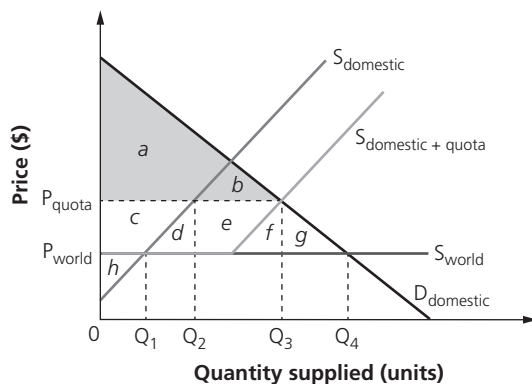
Award 1 mark for identifying the correct area of consumer surplus.

b Producer surplus for domestic firms before the imposition of the quota = h .



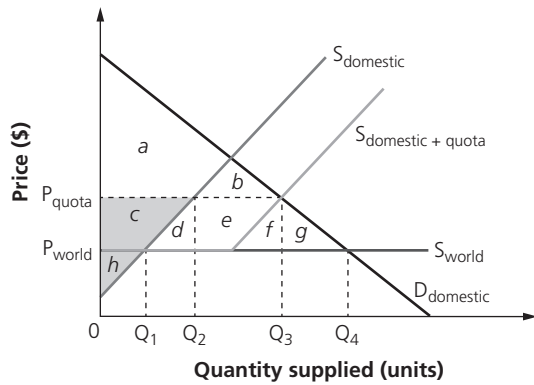
Award 1 mark for identifying the correct area of producer surplus.

c Consumer surplus after the imposition of the quota = $a + b$.



Award 1 mark for identifying the new area of consumer surplus.

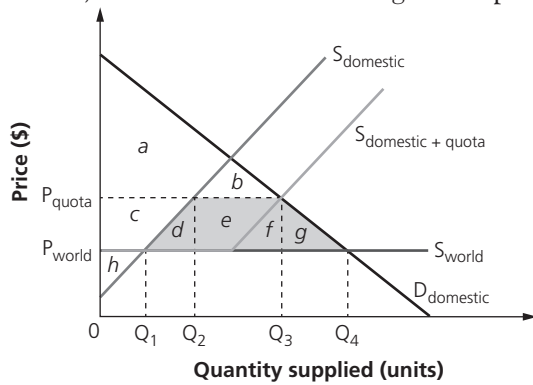
d Producer surplus for domestic firms after the imposition of the quota = $c + h$.



Note: The diagram above is for illustrative purposes only and is not required in the written answer.

Award 1 mark for identifying the new area of producer surplus.

- e The welfare loss following the imposition of the quota:
- Consumer surplus was $= a + b + c + d + e + f + g$ but is now just $a + b$.
 - Producer surplus was h but has increased to $h + c$.
 - Hence, the welfare loss following the imposition of the quota = $d + e + f + g$.



Award 1 mark for identifying the new area of welfare loss.

2 a The cost of the subsidy to the government = $(\$20 - \$10) \times 15 \text{ m} = \mathbf{\$150 \text{ million}}$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

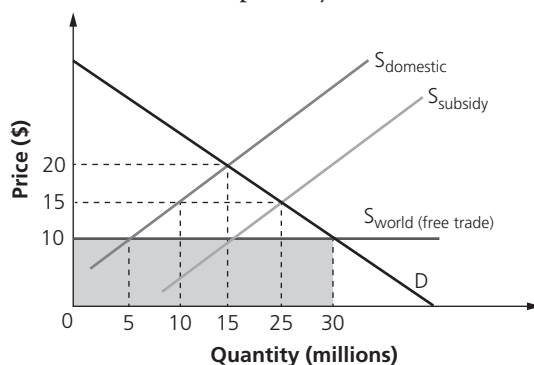
- b ■ The amount of imports before government intervention = difference between domestic demand (30 m) and domestic supply (5 m).
- $= 30 \text{ m} - 5 \text{ m} = \mathbf{25 \text{ million units}}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c ■ The amount of imports after government intervention = domestic demand – domestic supply.
- $= 30 \text{ m} - 15 \text{ m} = \mathbf{15 \text{ million units}}$

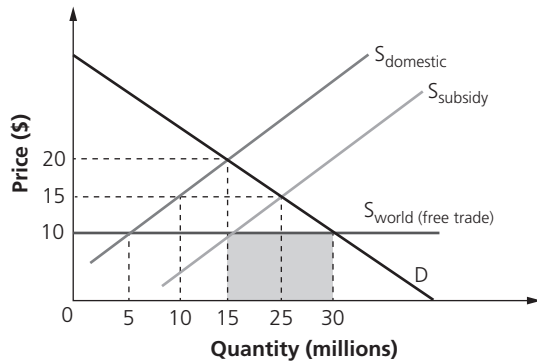
Award 1 mark for the correct answer and 1 mark for showing the working out.

d The total amount spent by domestic consumers under free trade = $\$10 \times 30 \text{ m} = \mathbf{\$300 \text{ million}}$.



Award 1 mark for the correct answer and 1 mark for showing the working out.

- e The total amount spent on imports after the imposition of the subsidy = $30\text{ m} - 15\text{ m} \times \$10 =$ **\$150 million.**



Note: The diagram above is for illustrative purposes only and is not required in the written answer.

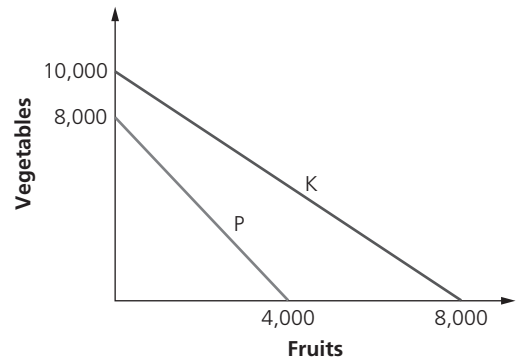
Award 1 mark for the correct answer and 1 mark for showing the working out.

- 3 a Country K has an absolute advantage in the production of vegetables.

Award 1 mark for identifying the correct country.

- b Country K should produce fruits because there is a much greater opportunity cost if it stops production of fruits. Country P only needs to give up 0.5 units of fruits to produce 1 unit of vegetables whereas Country K has to give up more (0.8 units) of fruits to gain the same amount (1 unit) of vegetables.

Alternatively, when Country P gives up 1 unit of fruits it can gain 2 units of vegetables. By contrast, Country K gains only 1.25 units of vegetables by giving up (the same) 1 unit of fruits:



	Fruits (units)	Vegetables (units)	Opportunity cost ratio
Country K	8,000	0	1 : 1.25
	0	10,000	
Country P	4,000	0	1 : 2
	0	8,000	

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why Country P should produce fruits.

- c $\frac{8,000}{4,000} \times 8 = 16$ units

	Fruits (units)	Vegetables (units)	Opportunity cost ratio
Country K	8,000	0	8 : 10
	0	10,000	
Country P	4,000	0	4 : 8 or 8 : 16
	0	8,000	

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 4 a ■ The ratio (or opportunity cost) = $15\text{ m} : 5\text{ m}$, i.e. 15 million units of alpha for 5 million units of beta.
 ■ Hence, the opportunity cost of Country E producing 1 million units of beta is (that it sacrifices) **3 million units** of alpha.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b ■ The ratio (or opportunity cost) = $20\text{ m} : 2\text{ m}$, i.e. 20 million units of alpha for 2 million units of beta.
 ■ Hence, the opportunity cost of Country F producing 1 million units of alpha is (that it sacrifices) **0.1 million units** (or 100,000 units) of beta.

Award 1 mark for the correct answer and 1 mark for showing the working out.

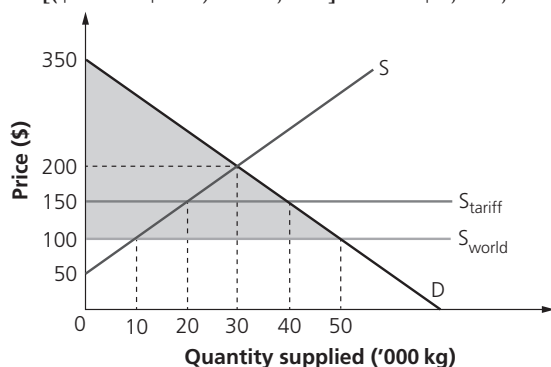
- c**
- **Country E** should specialize in the production of beta. By sacrificing 1 million units of alpha, Country E can produce 0.33 million units of beta. If Country F sacrificed 1 million units of alpha, it would only gain 0.1 million units of beta.
 - Alternatively, if Country E gave up producing 1 million units of beta, it would gain 3 million units of alpha, whereas Country F would gain 10 million units for doing the same thing. Hence, Country F should give up the output of beta.
 - Instead, Country F should specialize in the output of alpha, i.e. it has a comparative advantage in the output of alpha.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why Country E should specialize in the production of beta.

- 5 a** Consumers used to pay the world price of \$100 for 50,000 kg of output, but were willing and able to pay up to \$350. Hence, consumer surplus was:

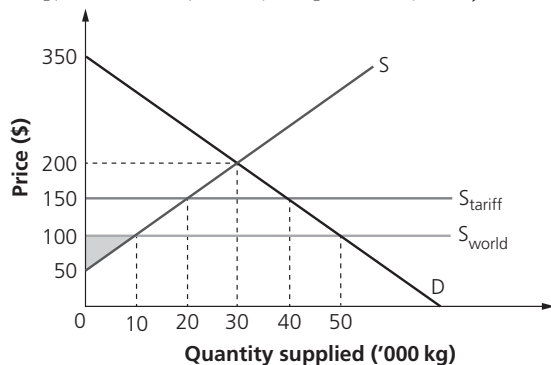
$$[(\$350 - \$100) \times 50,000] \div 2 = \$6,250,000 \text{ or } \mathbf{\$6.25 \text{ m}}$$



Award 1 mark for the correct answer and 1 mark for showing the working out.

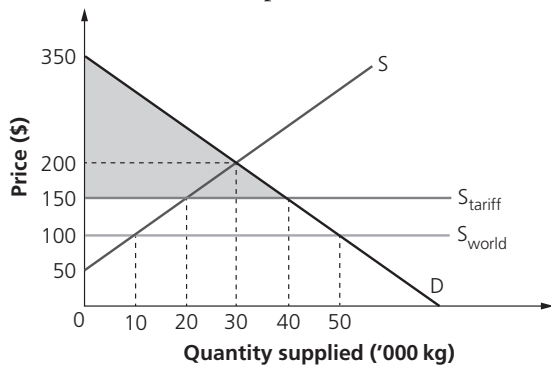
- b** Producers were willing and able to supply from a price of \$50 but received the higher world price of \$100, supplying 10,000 kg of output. Hence, the value of producer surplus was:

$$[(\$100 - \$50) \times 10,000] \div 2 = \mathbf{\$250,000}$$



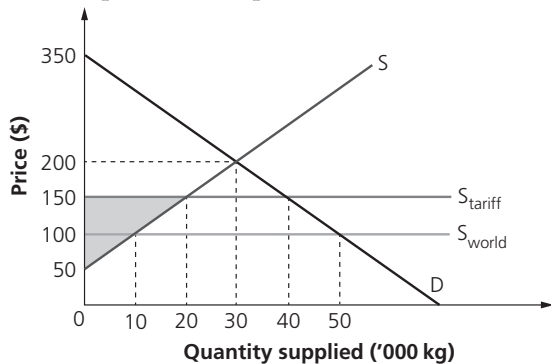
Award 1 mark for the correct answer and 1 mark for showing the working out.

- c ■ Consumers now pay a higher price of \$150 due to the tariff, and demand falls to 40,000 kg of output.
- Hence, consumer surplus falls to $[(\$350 - \$150) \times 40,000] \div 2 = \$4,000,000$ or **\$4 m.**



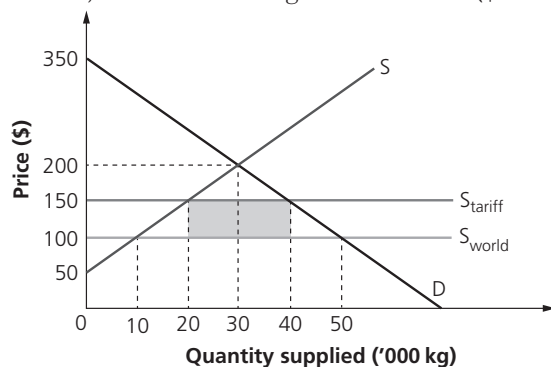
Award 1 mark for the correct answer and 1 mark for showing the working out.

- d ■ Producers in Country L now receive a higher price of \$150 due to the tariff, and supply 20,000 kg of output.
- Hence, producer surplus increases to $[(\$150 - \$50) \times 20,000] \div 2 = \$1,000,000$ or **\$1 m.**



Award 1 mark for the correct answer and 1 mark for showing the working out.

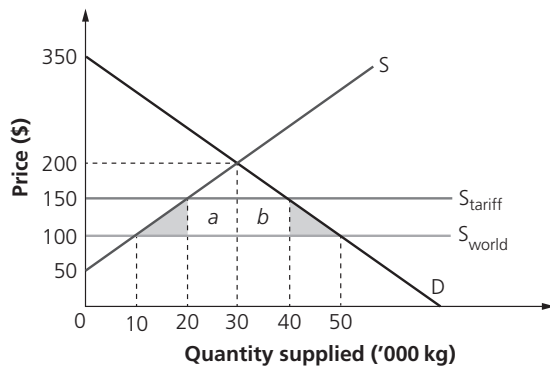
- e ■ Prior to the imposition of the tariff, the world supply was S_{world} but this shifts to S_{tariff} .
- The vertical distance between these two supply curves represents the per unit tariff, i.e. $\$150 - \$100 = \$50$ per kg.
- Foreign supply (which cannot be provided by domestic suppliers) falls to 40,000 kg, while domestic output increases from 10,000 kg to 20,000 kg.
- Hence, revenue to the government is: $(\$150 - \$100) \times (40,000 - 20,000) = \$1,000,000$ or **\$1 m.**



Award 1 mark for the correct answer and 1 mark for showing the working out.

- f The government gains areas $a + b$. The shaded areas show the net loss in consumer and producer surplus, i.e. the net welfare loss:

$$\frac{(\$150 - \$100) \times (20,000 - 10,000)}{2} + \frac{(\$150 - \$100) \times (50,000 - 40,000)}{2} = \$500,000$$



Award 1 mark for the correct answer and 1 mark for showing the working out.

3.2 Exchange rates

Freely floating exchange rates/Government intervention

- 1 a ■ GBP1 = HKD12.5
 ■ $6,000 \div 12.5 = 480$
 ■ Therefore, the price of the iPad = **GBP480**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b ■ AUD1 = GBP0.55 = HKD7.25
 ■ $\text{GBP1} = \frac{7.25}{0.55\text{HKD}}$
 ■ So **GBP1 = HKD13.18**.
 ■ Accept answers that show that HKD1 = GBP0.07587 or HKD1 = GBP0.076

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 2 a ■ As £1 = \$1.65, then a \$45,500 car = $\frac{1}{1.65} \times \$45,500 = \text{£}27,575.75$.
 ■ Accept £27,575 or £27,576.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b ■ The exchange rate is £1 = \$1.65, i.e. \$1 = £0.65.
 ■ Hence, the amount paid is $\$45 \times 0.65 = \text{£}27.27$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c $\$45 \times 0.60 = \text{£}27$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 3 Possible reasons include:
- an increase in interest rates in Nigeria
 - greater demand from Kuwaiti households for Nigerian exports
 - more Kuwaiti tourists visiting Nigeria
 - more firms from Kuwait investing directly in Nigeria.

Award up to 2 marks for explaining each possible reason, up to the maximum of 4 marks.

- 4 a ■ $150 - 5P = -25 + 9P$
 ■ $175 = 14P$
 ■ $P = 12.5$ (HK\$)
 ■ $£1 = \$12.5$

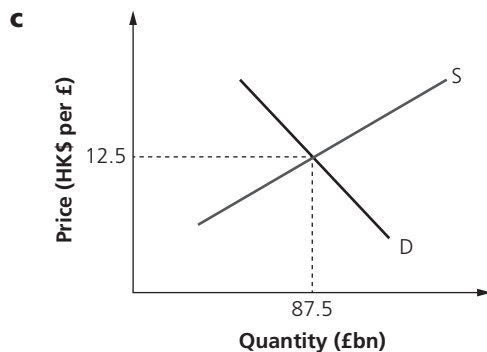
Award 1 mark for the correct answer and 1 mark for showing the working out.

- b ■ $Q_d = 150 - 5P$
 ■ $Q_d = 150 - (5 \times 12.5)$
 ■ $Q_d = 150 - 62.5$
 ■ $Q_d = £87.5$ bn

Or

- $Q_s = -25 + 9P$
 ■ $Q_s = -25 + (9 \times 12.5)$
 ■ $Q_s = -25 + 112.5$
 ■ $Q_s = £87.5$ bn

Award 1 mark for the correct answer and 1 mark for showing the working out.

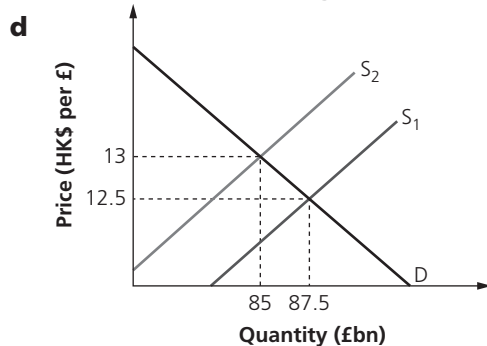


Award 1 mark for using the correct x- and y-axis labels.

Award 1 mark for an accurately drawn and labelled supply curve.

Award 1 mark for an accurately drawn and labelled demand curve.

Award 1 mark for determining the correct equilibrium exchange rate.



Award 1 mark for plotting the new supply curve.

Award 1 mark for identifying the new equilibrium exchange rate.

- 5 a An appreciation means that the value of the currency has increased. An example is the yuan rising in value against the US dollar from $\$1 = 6.25$ yuan to $\$1 = 6.10$ yuan.

Award 1 mark for an explanation that shows limited understanding.

Award 2 marks for a clear explanation that shows a good understanding of currency appreciation.

- b** The likely effects of China's currency appreciation include:
- China selling fewer exports as American and other foreign buyers need more yuan to pay for Chinese exports.
 - Chinese households and firms are more likely to buy imported products as their currency is worth more on the foreign exchange market.
 - This will tend to cause a current account deficit on the balance of payments for China, *ceteris paribus*.
 - However, this will depend on the price elasticity of demand (PED) for Chinese exports and imports.

Award up to 2 marks for explaining each reason, up to the maximum of 4 marks.

3.3 The balance of payments

The structure of the balance of payments

- 1 a** The balance of invisibles in the sum of trade in services.

Balance of trade in services (\$m)	2014
Transportation	-632
Communications	-531
Insurance	1,450
Others	3,776
Balance of invisibles	4,063

Hence, the balance of invisibles for Country F = **\$4.063 billion**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b** The balance of trade in goods is in deficit of \$1.824 bn whereas the balance of trade in services is in surplus of \$4.063 bn. This means the overall balance of trade is $-\$1.824 \text{ bn} + \$4.063 \text{ bn} = \mathbf{\$2.239 \text{ bn}}$.

Balance of trade in goods (\$m)	2014
Food, beverages and tobacco	-3,558
Oil	4,305
Finished manufactured goods	-685
Others	-1886
	-1,824
Balance of trade in services (\$m)	2014
Transportation	-632
Communications	-531
Insurance	1,450
Others	3,776
	4,063
Balance of trade	2,239

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 2 a** The balance of trade in services is the component of the current account that records the export earnings and import expenditure on services, e.g. banking, insurance, transportation and tourism.

Award 1 mark for a definition that shows limited understanding.

Award 2 marks for a clear definition that shows a good understanding of the term 'balance of trade in services'.

b

Balance of trade for Country K (\$bn)	
Exports	85
Goods	57
Services	28
Imports	88 + 15 = 103
Goods	88
Services	15
Balance of trade in goods	57 – 88 = (31)
Balance of trade in services	28 – 15 = 13
Trade balance	(31) + 13 = (18)

Award 1 mark for each correct answer, up to the maximum of 4 marks.

Apply the own figure rule (error carried forward) where appropriate.

- 3 a**
- The current account balance = (Exports of goods – Imports of goods) + (Exports of services – Imports of services) + Net income + Net current transfers
 - = (235 – 440) + (320 – 235) + 20 – 35
 - = –205 + 85 + 20 – 35 = –135
 - = **–\$135 bn**

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b**
- The Financial account = Net direct investment + Net portfolio investment
 - = 65 + 38 = 103
 - = **\$103 bn**

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c**
- Capital account = Capital transfers + Trade in non-produced, non-financial assets
 - = 26 + 20 = 46
 - = **\$46 bn.**

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d**
- The balance of payments must balance.
 - Current account = (Financial account + Capital account) + (Reserve asset funding + Errors and omissions)
 - –\$135 bn = \$103 bn + \$46 bn + x
 - –\$135 bn = \$149 bn + x
 - x = –\$14 bn
 - Hence, Reserve asset funding + Errors and omissions = **–\$14 bn.**

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 4 a** The balance of trade is the sum of international trade in goods and services of an economy, i.e. the difference between the value of the country's total export earnings and its total import expenditure. It is the largest component of a country's balance of payments.

Award 1 mark for a definition that shows limited understanding.

Award 2 marks for a clear definition that shows a good understanding of the term 'balance of trade'.

- b** For the whole time period shown, Sri Lanka has experienced a deficit on its trade balance. Possible causes of this persistent deficit include:
- deteriorating international competitiveness, leading to a fall in exports from Sri Lanka
 - appreciation of the Sri Lankan currency (the rupee), which reduces the demand for the country's exports
 - higher prices of imported raw materials and essential products such as petroleum (gasoline) and foodstuffs
 - decline in tourism revenues
 - poor terms of trade as Sri Lanka relies on the export of textiles and crops to pay for its imports, e.g. falling prices of tea and coconut products (major export products of Sri Lanka).

Note: The terms of trade do not need to be mentioned explicitly in the answer.

Award 2 marks for explaining each possible cause of Sri Lanka's persistent balance of trade deficit, up to the maximum of 4 marks.

- 5 a** A current account surplus is a situation when a country's balance of net export earnings, net income and net current transfers is positive. This is mainly due to higher demand for exports and/or lower demand for imports.

Award 1 mark for a definition that shows limited understanding.

Award 2 marks for a clear definition that shows a good understanding of the term 'current account surplus'.

- b** Consequences of Kuwait's persistent current account surplus during the 21st century could include:
- employment opportunities due to the higher demand for exports from Kuwait
 - improved standards of living as the country receives more foreign currency than it spends on imports (although the lack of access to imports can hinder the standards of living for those living in Kuwait)
 - inflationary pressures as more money continually enters the economy
 - higher value of the exchange rate (Kuwaiti dinar) due to the continually high demand for Kuwaiti exports. However, given it is one of the world's largest net exporters of oil – the demand for which is highly price inelastic – this might be very positive for the economy
 - greater direct investments from abroad bring funds to Kuwait, thus aiding its economic growth and development.

Note: The chart does not show the current account surplus, merely the % of GDP accounted for by Kuwait's current account. Notice the decline in 2001 (9/11 terrorist attacks) and 2003 (outbreak of the infectious SARS virus) affecting the global demand for oil.

Award up to 2 marks for explaining each consequence, up to the maximum of 4 marks.

3.4 Terms of trade (HL only)

The meaning of the terms of trade

- 1 a** The terms of trade ($P_x \div P_m$) have worsened for the LEDC, dropping from 93 to 84 in the given time period.

	2013	2014	2015
Index of export prices	102.1	100.5	97.8
Index of import prices	109.6	112.6	116.4
Terms of trade	93.15	89.25	84.02

This means that the LEDC needs to sell more exports in order to pay for the same (or any) amount of imports.

Award up to 2 marks for calculating correctly the TOT.

Award up to 2 further marks for the explanation of the answer, with effective application of the data.

- b** Possible reasons why LEDCs tend to experience a deterioration in their terms of trade include:
- the low prices of goods and services produced in LEDCs, such as primary sector output
 - the demand for primary sector products produced in LEDCs tends to be highly price inelastic
 - the demand for primary sector products produced in LEDCs is also income inelastic
 - LEDCs tend to suffer from falling exchange rates (making the price of their goods and services relatively cheap)
 - the higher-priced products from MEDCs, such as premium-priced consumer electronics and value-added services
 - demand for products made in MEDCs is also relatively income elastic (as the GDP in LEDCs rises, people will tend to buy more foreign goods and services produced in MEDCs, thus forcing up the price of imports from MEDCs).

Award up to 2 marks for explaining each reason, up to the maximum of 4 marks.

2 a

Exports	Unit price	Weighting	Weighted index
Apples	\$2.3	0.4	$\$2.3 \times 0.4 = 0.92$
Bananas	\$3.5	0.1	$\$3.5 \times 0.1 = 0.35$
Carrots	\$3.0	0.5	$\$3.0 \times 0.5 = 1.5$
Weighted price index for exports			$0.92 + 0.35 + 1.5 = 2.77$

Award 1 mark for the correct answer and up to 2 further marks for showing the full working out.

b

Imports	Unit price	Weighting	Weighted index
Durian	\$8	0.3	$\$8 \times 0.3 = 2.4$
Eggplant	\$5	0.6	$\$5 \times 0.6 = 3$
Fennel	\$4	0.1	$\$4 \times 0.1 = 0.4$
Weighted price index for imports			$0.92 + 0.35 + 1.5 = 5.8$

Award 1 mark for the correct answer and up to 2 further marks for showing the full working out.

- c**
- $TOT = (\text{Index of average export prices} \div \text{Index of average import prices}) \times 100$
 - $TOT = 2.77 \div 5.8 = 47.76$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d** Assuming that nothing else changes, the country's terms of trade will improve. This is because carrots account for 50% of the country's exports. With this significantly higher export price, the country's TOT will improve, *ceteris paribus*.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why the country's terms of trade will improve.

3 a The price index of rice exports in 2014 = $\frac{481.6}{430} \times 100 = 112.0$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

b The price index of milk imports in 2014 = $\frac{22.6}{19.2} \times 100 = 117.7$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

c The terms of trade in 2014 = $\frac{112.0}{117.7} \times 100 = 95.2$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d The information below shows that between 2013 and 2015, the terms of trade in Country M worsened, from 100.0 to 95.3. This is because the average price of exports has increased at a slower pace (of 17.6%) than the increase in the average price of imports (which have increased by 23.4%).

Year	Price of rice exports (\$ per unit)	Price index (rice)	Price of milk imports (\$ per unit)	Price index (milk)	Terms of trade
2012	430.0	100.0	19.2	100.0	100.0
2013	481.6	112.0	22.6	117.7	95.2
2014	505.7	117.6	23.7	123.4	95.3

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why the TOT in Country M worsened.

- 4 a The price index for tea in 2011 = $\frac{320}{288} \times 100 = 111.1$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b The price index for oil in 2013 = $\frac{109}{104} \times 100 = 104.8$.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c ■ Divide the Price index of the export (oil) by the Price index of the import (tea).
 ■ $TOT = \frac{104.8}{88.2} \times 100 = 118.8$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- d ■ $TOT = \text{Price index of export (tea)} \div \text{Price index of import (oil)}$
 ■ $TOT \text{ in } 2011 = \frac{111.1}{94.2} \times 100 = 117.9$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- e ■ The terms of trade for the USA has improved from 84.8 to 118.8 while that for Sri Lanka has dropped from 117.9 to just 84.2.
 ■ Hence, the TOT have improved for the US economy between 2011 and 2013.

Year	Average price of oil (\$ per unit)	Price index (oil)	Average price of tea (\$ per unit)	Price index (tea)	TOT (USA)	TOT (Sri Lanka)
2011	98	94.2	320	111.1	84.8	117.9
2012	104	100.0	288	100.0	100.0	100.0
2013	109	104.8	254	88.2	118.8	84.2

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why the TOT for the USA improved.

- 5 a ■ $\text{Price index} = \frac{\text{2014 price}}{\text{Base year price}}$
 ■ $\text{Price index} = \frac{667.7}{606.5} \times 100 = 110.09$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b** ■ $TOT(2013) = \frac{P_x}{P_m}$
- $P_x = \frac{620.4}{606.5} \times 100 = 102.29$
 - $P_m = \frac{141.95}{83.5} \times 100 = 170$
 - $TOT = \frac{102.29}{170} = 60.17$

Year	Price of sugar exports (\$ per unit)	Index number (sugar)	Price of cotton imports (\$ per unit)	Index number (cotton)	Terms of trade
2012	606.50	100.00	83.50	100.00	100.00
2013	620.40	102.29	141.95	170.00	60.17

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c** It can be concluded from the table below (shown for illustrative purposes only) that between 2012 and 2014 the terms of trade of Country L have improved by 17.74% from 100.0 to 117.74. However, it can be noted that the volatile price of cotton imports has caused the TOT to fluctuate hugely, dropping from 100.0 to 60.17 between 2012 and 2013 (due to the 70% increase in the price of cotton imports) and then rising dramatically to 117.74 the year after (due to the 45% drop in the price of cotton imports).

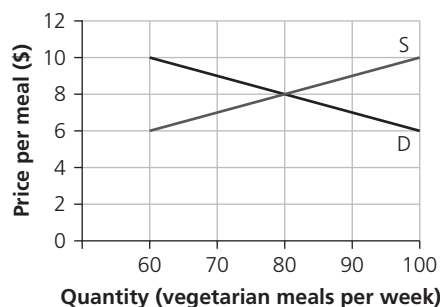
Year	Price of sugar exports (\$ per unit)	Index number (sugar)	Price of cotton imports (\$ per unit)	Index number (cotton)	Terms of trade
2012	606.50	100.00	83.50	100.00	100.00
2013	620.40	102.29	141.95	170.00	60.17
2014	667.70	110.09	78.07	93.50	117.74

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why Country L's TOT improved.

Mock exam practice paper

1 a



Award 1 mark for correctly labelling ('Price per meal (\$)') and accurately scaling the x-axis.

Award 1 mark for correctly labelling ('Quantity (vegetarian meals per week)') and accurately scaling the y-axis.

Award 1 mark for accurately plotting and labelling the demand curve.

Award 1 mark for accurately plotting and labelling the supply curve.

- b** ■ $Q_d = a - bP = 160 - 10P$
 ■ $Q_s = c + dP = 0 + 10P = 10P$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c** ■ $160 - 10P = 10P$
 ■ $160 = 20P$
 ■ $P = \$8$ per vegetarian meal
 ■ Equilibrium quantity traded = $160 - 10(8) = 0 + 10(8)$
 ■ $160 - 80 = 80$ vegetarian meals

Award 1 mark for the correct answer and up to 2 further marks for showing the full working out.

The correct units of measurement are needed for full marks.

- d** ■ Excess demand @ \$6 = 40 meals
 ■ Excess supply @ \$9 = 20 meals

Award up to 2 marks for accurately showing the excess demand on the diagram.

Award up to 2 marks for accurately showing the excess supply on the diagram.

The correct units of measurement must be clearly shown on the diagram for full marks.

- e** ■ Substitute 86 into $Q_d = 160 - 10P$
 ■ $86 = 160 - 10P$
 ■ $10P = 74$
 ■ $P = \$7.40$ per vegetarian meal

Award 1 mark for the correct answer and 1 mark for showing the working out.

- f** ■ $Q_{s_2} = 0 + 10(P - 2)$
 ■ $0 + 10P - 20$
 ■ $Q_{s_2} = -20 + 10P$
 ■ As $Q_d = 160 - 10P$, then equilibrium is $160 - 10P = -20 + 10P$.
 ■ $20P = 180$
 ■ Hence, $P_{+tax} = \$9$ and $Q_e = 160 - 10(9) = 70$ meals per week.

Award 1 mark for each correct answer, up to a maximum of 2 marks.

Award 1 further mark for showing the working out.

Award 1 mark for identifying equilibrium price and quantity on the diagram.

- g** ■ Number of meat dishes = 100 per week
 ■ Tax = \$10 per meal
 ■ Total tax revenue = **\$1,000** per week

Award 1 mark for the correct answer and 1 mark for showing the working out.

- h** ■ Number of meat dishes = 100 per week
 ■ Tax incidence on producer = \$5 per meal
 ■ Total tax payable = **\$500** per week

Award 1 mark for the correct answer and 1 mark for showing the working out.

- i** Deadweight loss = $\frac{\$10 \times 20}{2} = \mathbf{\$100}$ welfare loss

Award 1 mark for the correct answer and 1 mark for showing the working out.

- 2 a i** $Q_d = Q_s$ for equilibrium, so:
 ■ $150 - 25P = 50 + 25P$
 ■ $100 = 50P$
 ■ $2 = P$
 ■ Hence, **USD1 = NZD2**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- ii** Setting $Q_d = Q_s$, we can see that the new exchange rate is:
 ■ $160 - 25P = 50 + 25P$
 ■ $110 = 50P$
 ■ $P = 2.2$
 ■ Hence, the US dollar is now worth **NZD 2.2**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

- iii** Higher interest rates in the USA tend to increase the demand for the USD due to speculative reasons, e.g. savings in US banks attracting a higher return. Hence, this tends to increase the value of the USD on the foreign exchange market.

Award 2 marks for the correct explanation.

- iv** Reasons for a stronger USD against the NZD could include:
 ■ higher demand for US imports from NZ citizens, perhaps due to higher incomes in NZ
 ■ stronger consumer and producer confidence in the US economy relative to the NZ economy
 ■ FDI of NZ firms in the USA.

Award 1 mark for a relevant reason and 1 mark for the explanation.

- b i** ■ $BOT = \text{Net exports} - \text{Net imports}$
 ■ $-\$32 \text{ bn} + \$10 \text{ bn} + \$15.3 = \mathbf{-\$6.7 \text{ bn}}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- ii** ■ $\text{Current account} = \text{Balance of trade} + \text{Net income} + \text{Net transfers}$
 ■ $-\$6.7 \text{ bn} + \$8.2 \text{ bn} - \$4 \text{ bn} = \mathbf{-\$2.5 \text{ bn}}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- c i** ■ 2012: $\frac{17,095}{17,805} \times 100 = 96.0$
 ■ 2014: $\frac{16,060}{17,805} \times 100 = 90.2$

Award 1 mark for each answer, up to 2 marks.

Award 1 mark for showing the working out.

- ii ■ The price of rice fell between 2012 and 2014./The price of rice rose between 2012 and 2013.
- The price index fell from 96.0 to 90.2, i.e. fell by **6.04%** from 2012 to 2014 (or a 9.8% drop in price since 2013).

Award 1 mark for each correct answer.

- iii ■ $TOT = \text{Index price of the export} \div \text{Index price of imports}$
- $= \frac{113.8}{90.2} \times 100 = \mathbf{126.2}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- iv ■ $TOT = \frac{90.2}{113.8} \times 100 = \mathbf{79.3}$
- The terms of trade have improved for the US economy (having risen to 126.2 compared to Thailand's worsening terms of trade to 79.3).

Award 1 mark for the correct answer and 1 mark for showing the working out.

Award 1 mark for identifying the USA as having experienced an improvement in its TOT.

- v ■ Percentage change in price of silver = $\frac{\$1,650 - \$1,540}{\$1,540} = +7.14\%$
- Percentage change in price of rice = $\frac{\$16,060 - \$17,095}{\$17,095} = -6.05\%$
- The price of **silver** saw a greater fluctuation (+7.14% compared to a 6.05% drop in the price of rice).

Award 1 mark for the correct answer and 1 mark for showing the working out.

Award 1 mark for identifying that silver saw the greatest percentage change in price.

- 3 a i** Demand refers to the willingness and ability of customers to pay a certain price to obtain a particular good or service. The quantity demanded of a good or service increases as its price falls, ceteris paribus, as the data show.
- ii ■ TR with 2 units = $\$9 \times 2 = \18
 - TR with 3 units = $\$8 \times 3 = \24
 - Hence, MR = **\$6**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

iii

Price (\$)	Quantity demanded (units)	Total revenue (\$)
10	1	\$10
9	2	\$18
8	3	\$24
7	4	\$28

Award 1 mark for the correct answer and 1 mark for showing the working out.

- b i** At MC = MR, the profit-maximizing price is **0a**.

Award 1 mark for identifying the correct price.

- ii At MC = MR (i.e. output of 0g), total costs = **0bdg**.

Award 1 mark for identifying the area of total costs.

- iii Abnormal profit (or supernormal profit) is any profit earned over and above the level of normal profit. It includes both explicit costs (such as the costs of production) and implicit costs (such as the opportunity cost of one's own skills and value). Abnormal profit is shown by the area *abcd* on the diagram.

Award 1 mark for an answer that shows limited understanding.

Award 2 marks for an answer that shows some understanding, although there is limited application of the diagram.

Award 3 marks for an answer that shows good understanding, with appropriate use of the data in the diagram.

- iv ■ Profit is used as a source of funds for business growth/expansion.
 ■ Profit is used to finance R&D – important for a firm's survival and international competitiveness.
 ■ Natural monopolies are protected by law so benefit from huge-scale production and profits.
 ■ As a monopolist with no competitors, the firm is a price setter so can charge relatively high prices for its price inelastic products, thus earning abnormal profits.

Award up to 2 marks for explaining each reason, up to the maximum of 4 marks.

- v The monopolist is allocatively inefficient as it produces less than if it operated in a competitive market. It is also productively inefficient because by limiting its output, the monopolist does not operate at the lowest point on its ATC curve.

Award 1 mark for an answer that shows limited understanding.

Award 2 marks for an answer that shows some understanding, although there is limited application of the diagram.

Award 3 marks for an answer that shows good understanding, with appropriate use of the data in the diagram.

- vi **Oh**, as this is where marginal revenue = zero (so total revenue is maximized).

Award 1 mark for stating the desired level of output.

- c i ■ Equilibrium occurs at $MC = MR$, i.e. output level **Of**
 ■ Profit-maximizing price = **Oa**
 ■ Productive efficiency = $MC = AC$, i.e. output level **Og**

Award 1 mark for each correct answer that is identified, up to the maximum of 3 marks.

- ii ■ Price rigidity is shown by the range *c–d* (vertical section of the MR curve).
 ■ As this falls on the demand curve at the level of output where $MC = MR$ (profit maximization), the price stays at **Oa**.
 ■ Asymmetric information and interdependence of oligopolists creates price rigidity.

Award 1 mark for an answer that shows limited understanding.

Award 2 marks for an answer that shows some understanding, although there is limited application of the diagram.

Award 3 marks for an answer that shows good understanding, with appropriate use of the diagram.

- 4 a ■ CPI is the weighted price index used to calculate changes in the cost of living against a base year.
 ■ It measures changes in the price of a representative basket of goods and services for the typical household in the country over a period of time, generally a year.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of the CPI.

b i

Product	Average monthly quantity of purchases	Average price (\$) in 2013	Value of basket (\$) in 2013	Average price (\$) in 2014	Value of basket (\$) in 2014
e-Books	8	10	80	11	88
Contact lenses	30	2	60	2.5	75
Pizza	4	12	48	11	44
Mobile phone bill	1	35	35	38	38
Clothing	3	20	60	22	66
Total			283		311

■ The index for 2013 = $\frac{\$283}{\$268} \times 100 = \mathbf{105.59}$

■ The index for 2014 = $\frac{\$311}{\$268} \times 100 = \mathbf{116.00}$

Award 1 mark for an answer that shows limited understanding.

Award 2 marks for an answer that shows some understanding, although there are more than two errors or omissions.

Award 3 marks for an answer that shows a good understanding, with effective use of the data.

ii ■ Inflation between 2012 and 2013 = $\frac{105.6 - 100}{100.0} \times 100 = \mathbf{5.6\%}$

■ Inflation between 2013 and 2014 = $\frac{116.0 - 105.6}{105.6} \times 100 = \mathbf{9.85\%}$

Award 1 mark for a correct answer to each of the two years.

Award 1 mark for the correct calculations.

- iii ■ The cost of living, as measured by the CPI, indicates that prices have risen on average by 16% between 2012 (CPI = 100) and 2014 (CPI = 116).
- Prices rose significantly between 2013 and 2014 (inflation was 9.85%) compared to between 2012 and 2013 (when inflation was 5.6%).
- Answers might acknowledge that nominal income is assumed to remain constant in the answer.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of why the cost of living has increased.

- iv The average household in Jukeland spent only \$44 on pizza, whereas it spent \$66 on clothing in 2014. In the previous year, households spent an average of \$48 on pizza but \$60 on clothing. Hence, as the average household spends more on clothing than on pizza, it is deemed to be more important. Statistical weights are applied to signify the degree of importance of clothing and pizza in the CPI (to reflect the cost of living for the average household in Jukeland).

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows some understanding of why clothing is considered more important than pizza to people in Jukeland. The data, if used, is superficially applied.

Award 3 marks for an answer that shows a good understanding of why clothing is considered more important than pizza to people in Jukeland. The data is well applied.

- c ■ Weights should/need to be applied to ensure the CPI reflects the true cost of living for the average household.
- The CPI is not representative of all/many households, e.g. pensioners, the unemployed, single people compared to married couples with children, the very wealthy or those who live in different regions of the country.
- The CPI ignores income and wealth inequalities and their impact on consumer spending and hence the cost of living.

- Not all goods and services have the same rate of inflation as the CPI is only an average, so the reality of price rises will affect some households far more than others.
- Some answers might include specific figures from the data, e.g. contact lens wearers will be hard hit by this inflation, whereas glasses-wearers (or those who need neither) won't be.

Award up to 2 marks for explaining each drawback, up to the maximum of 4 marks.

- d i** Nominal GDP is the total value of final output of all goods and services within a country, per time period.
- Definition must mention value of GDP (not 'amount' as this can mean 'volume').
 - Definition must refer to nominal GDP, i.e. current prices or prices not adjusted for inflation.

Award 1 mark for a definition that shows limited understanding.

Award 2 marks for a clear definition that shows a good understanding of the term 'nominal GDP'.

- ii** ■ $\text{Nominal GDP} = C + I + G + (X - M)$
 ■ $= 236 + 65 + 45 + (37 - 38) = \mathbf{\$345 \text{ billion}}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- iii** ■ $\text{Nominal GNI} = \text{Nominal GDP} + \text{Net property income from abroad}$
 ■ $= 345 - 12 = \mathbf{\$333 \text{ billion}}$

Award 1 mark for the correct answer and 1 mark for showing the working out.

- iv** ■ $\text{Multiplier} = \frac{1}{1 - \text{MPC}}$ or $\frac{1}{\text{MPM} + \text{MPT} + \text{MPS}}$
 ■ $\text{Multiplier} = \frac{1}{1 - 0.55} = \frac{1}{0.45} = \mathbf{2.22}$
 ■ $\text{Change in nominal GDP} = \$25 \times 2.22 = \text{an increase of } \mathbf{\$55.55 \text{ million.}}$

Award 2 marks for correct calculation and answer for the multiplier.

Or

Award 2 marks for correct calculation and identification of the positive change in the GDP.