

2019 specification
first exams in 2021 (2020 for AS)

Topic Tests

Microeconomics

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Teacher's Introduction

This resource consists of a set of Topic Tests that have been written to support the teaching of OCR A Level Year 1 (or AS) Microeconomics. It allows teachers and students to check their understanding and consolidate knowledge of each part of the OCR specification. In each Topic Test there is a mixture of numerical, multiple-choice, short-answer and essay-style questions of a variety of different difficulties. There are 10 Topic Tests in this resource, following the topics of the A Level and AS specifications. The topic numbers used correspond with the A Level specification, hence 2.7, 2.9 and 2.10 appear missing; they are covered in the A Level Year 2 resource.

Importantly, each Topic Test is accompanied by a set of detailed answers that could be handed out to students as a basis for 'model' answers in the examination. Note that although the Topic Test questions aren't always in exam format, the questions within have been written carefully with the intention of testing the range of Assessment Objectives and often borrow aspects that are similar to those in the exam.

Most of the case studies in the Topic Tests include up-to-date economic data and scenarios that should place economic theory in recent history, enrich students' general knowledge of the subject, and prepare students for the Data Response aspects of the examination. Moreover, the resource also includes plenty of opportunities for students to practise the Quantitative Skills outlined in the Appendix of the OCR specification.

Most Topic Tests contain 30–40 marks worth of questions, although some tests are shorter to cover each specification topic appropriately according to its scope. It is intended that the longer Topic Tests will take about one hour to complete and should be presented to students *after* teaching the parts of the specification that are to be tested. However, the Topic Tests could also be given to students as homework in order to consolidate their knowledge outside of the classroom, or certain aspects could be used as a supplement to in-class learning.

It is important to note that this resource should be used as a complement to other resources such as textbooks and practice exam papers, and not in isolation. These Topic Tests include plenty of explanation of the theory in the mark scheme, but students should be encouraged to access information as widely as possible.

It is hoped that this resource, as well as offering support for teaching the essential elements of the OCR Microeconomics specification, will help students fully prepare for their AS and A Level examinations. The economic environment is constantly in flux, and full of fascinating current issues. This resource attempts to share some of these current issues as a basis for teaching in the most interesting way possible, meanwhile encouraging further study from the next generation of Economists!

Happy teaching!

August 2019

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Mark Scheme: Levels of Response Tables for Long-answer Questions

8 marks

Knowledge (1), application (1) and analysis (3)		
	0	No relevant answer given.
Level 1	1–3	Some knowledge of economic concepts is shown, partially linked to the question, but may focus too much on one side of an argument.
Level 2	4–5	Knowledge of the economic concepts is very accurate. Links to the question are clear. Examples are relevant. Analysis is well reasoned and logical, and appropriate for the question.
Evaluation (3)		
	0	No evaluation.
Level 1	1	Limited attempt at evaluation – may be only loosely related to the question and poor reasoning.
Level 2	2–3	Accurate, balanced evaluative comments are made, supporting a rounded conclusion to the question.

10 marks

Knowledge (2), application (2) and analysis (2)		
	0	No relevant answer given.
Level 1	1–2	A few concepts may be identified correctly, but inconsistently, and with little or no reasoning behind the causes and effects.
Level 2	3–4	Some knowledge of economic concepts is shown, partially linked to the question, but may focus too much on one side of an argument.
Level 3	5–6	Knowledge of the economic concepts is very accurate. Links to the question are clear. Examples are relevant. Analysis is well reasoned and logical, and appropriate for the question.
Evaluation (4)		
	0	No evaluation.
Level 1	1–2	Limited attempt at evaluation – may be only loosely related to the question and poor reasoning.
Level 2	3–4	Accurate, balanced evaluative comments are made, supporting a rounded conclusion to the question.

15 marks

Knowledge (3), application (3) and analysis (3)		
	0	No relevant answer given.
Level 1	1–3	A few concepts may be identified correctly, but inconsistently, and with little or no reasoning behind the causes and effects.
Level 2	4–6	Some knowledge of economic concepts is shown, partially linked to the question, but may focus too much on one side of an argument.
Level 3	7–9	Knowledge of the economic concepts is very accurate. Links to the question are clear. Examples are relevant. Analysis is well reasoned and logical, and appropriate for the question.
Evaluation (6)		
	0	No evaluation.
Level 1	1–2	Limited attempt at evaluation – may be only loosely related to the question and poor reasoning.
Level 2	3–4	Clear evidence of evaluative comments, though they may be unfairly weighted. Reasoning / supporting evidence is provided but may be inconsistent.
Level 3	5–6	Accurate, balanced evaluative comments are made, supporting a rounded conclusion directly to the question.

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20 marks

Knowledge (4), application (4) and analysis (6)		
	0	No relevant answer given.
Level 1	1–3	A few concepts may be identified correctly, but inconsistently, and with little or no support behind the causes and effects.
Level 2	4–6	Some knowledge of economic concepts is shown, partially linked to the question, but with little or no support behind the causes and effects.
Level 3	7–10	Good knowledge of the relevant economic concepts is displayed, linked to the question, with evidence to support the main arguments. Analysis is well developed, but may be inconsistent or incomplete.
Level 4	11–14	Excellent knowledge of the economic concepts is very accurate. Links to the question are clear and supported by examples. Analysis is well reasoned and logical, and appropriate for the question.
Evaluation (6)		
	0	No evaluation.
Level 1	1–2	Limited attempt at evaluation – may be only loosely related to the question and the reasoning.
Level 2	3–4	Clear evidence of evaluative comments, though they may be unfairly weighted or inconsistent with the argument. Reasoning / supporting evidence is provided but may be inconsistent or incomplete.
Level 3	5–6	Accurate, balanced evaluative comments are made, supporting a rounded conclusion directly to the question.

25 marks

Level of Response	Response
5	Strong answer with well-grounded evaluation <ul style="list-style-type: none"> • Clear understanding of the economic ideas • Applied accurately to the question, using supporting data where needed • Sound, well-reasoned analysis • Strong, well-supported evaluation
4	Strong answer, with some good evaluation <ul style="list-style-type: none"> • Clear understanding of the economic ideas • Applied accurately to the question, using supporting data where needed • Some sound, well-reasoned analysis • Reasonable evaluation content, with some support
3	Reasonable answer, but poor evaluation <ul style="list-style-type: none"> • Adequate understanding of the economic ideas • Satisfactorily applied to the question, using some supporting data • Adequate analysis, might be underdeveloped or lacking in detail • Reasonable attempt at evaluation, but lacking support for arguments
2	Fairly weak answer <ul style="list-style-type: none"> • Limited understanding of economic ideas • Loosely applied to the question • Limited analysis, may be unfocused and inconsistent • Limited attempt at evaluation, likely to be unsupported
1	Weak answer <ul style="list-style-type: none"> • Poor understanding of relevant economics • Limited analysis • Unsupported or irrelevant evaluation

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Mark Breakdown Test-by-test

Topic Test 1.1	
Question	Mark
1	1
2	1
3	2
4	3
5	2
6(a)	4
6(b)	2
7	1
8	1
9	1
10	1
11	4
12	5
Total	34

Topic Test 1.2	
Question	Mark
1	2
2	6
3(a)	2
3(b)	1
4	4
5	4
6	1
7	8
8	8
Total	30

Topic Test 1.3	
Question	Mark
1	2
2	2
3(a)	3
3(b)(i)	1
3(b)(ii)	1
3(b)(iii)	1
3(c)	1
4	2
5	8
Total	21

Topic Test 2.1–2	
Question	Mark
1	1
2	4
3	2
4	1
5	2
7	1
8	1
9	1
10(a)	3
10(b)	2
11	4
12	3
13	3
Total	32

Topic Test 2.3	
Question	Mark
1	2
2	1
3	1
4	3
5(a)	1
5(b)	4
6	2
7	15
8	4
Total	34

Topic Test 2.4–5	
Question	Mark
1	2
2	2
3	2
4	1
5	1
6(a)	1
6(b)	1
6(c)	4
7	3
8	1
9	1
10	1
11	1
12	2
13	3
14	6
Total	31

Topic Test 2.6	
Question	Mark
1	1
2(a)	2
2(b)	2
3(a)	1
3(b)	1
4	4
5	4
6(a)	2
6(b)	2
7	4
8(a)	1
8(b)	1
8(c)	1
9(a)	2
9(b)	2
10	1
11(a)	2
11(b)	2
12	1
13	2
14	4
Total	42

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Topic Test 1.1: The Economic Problem

1. Which of the following is a **positive** economic statement?
 - A The UK's inflation rate rose by 2% between 2015 and 2016.
 - B To avoid the unintended consequences of 'The War of Drugs' the government should regulate illicit substances.
 - C Firms ought to be able to pollute as much as they need so long as they are producing beneficial commodities.
 - D Governments should always aim to reduce their public expenditure, even if it means cutting public services.
2. Which of the following is the definition of a free good?
 - A A free good is a good that is free of charge at the point of use – e.g. street lighting.
 - B A free good is a good that's use has zero opportunity cost.
 - C A free good is a good that is thought of as 'scarce'.
 - D A free good is something you get for free as a promotional offer from a business.
3. What is meant by the 'basic economic problem'?
4. Identify which **three** of the following are 'needs'.
 - A Food
 - B Internet
 - C Jewellery
 - D Shelter
 - E Holidays
 - F Clothing
5. Explain, using an example, how scarcity necessarily means that economic agents must make choices.
6. (a) Identify the **four** factors of production.
(b) What are the **key** economic benefits for each of these factors of production?
7. Explain **two** reasons/limitations why economic agents might not act rationally.
8. Using an example, explain what is meant by maximisation.
9. Traditionally, economic theory states that consumers seek to maximise which of the following?
 - A Utility
 - B Longevity
 - C Happiness
 - D Friendship
10. Traditionally, economic theory states that firms seek to maximise which of the following?
 - A Sales volume
 - B Consumer satisfaction
 - C Revenue
 - D Profit
11. Explain **two** possible reasons why a government might intervene in the market.

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12. Table 1 outlines a number of objectives held by a fictional government.

Table 1

	Objective
(a)	Increasing consumer usage of alternative fuel vehicles, such as Toyota automobile the Prius.
(b)	Decreasing the consumption of illicit substances such as cocaine, heroin.
(c)	Increasing investment in research and development of goods that will improve the long-run economy.
(d)	Decreasing congestion in the nation's inner-cities during peak traffic hours.
(e)	Decreasing the number of students electing to enter into more vocational training (e.g. plumbing, construction, electrical installation, hairdressing), as opposed to university.

Identify a potential incentive for each of objectives (a–e) that the government could use to influence economic behaviour and achieve their objectives.

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Topic Test 1.2: The Allocation of Resources

1. What is meant by resource allocation?
2. Analyse whether incentives are effective in influencing the behaviour of economic agents.
3. (a) What is meant by a 'mixed economy'?
(b) State **one** real economy that operates as a mixed economy.
4. How do market economies allocate resources?
5. How do mixed economies allocate resources?
6. Allocative efficiency is achieved...
 - A When resources are allocated equally across society.
 - B When resources are distributed optimally in society according to consumer preferences, therefore, maximising utility.
 - C When firms in a society produce at minimum cost, choosing an optimal combination of inputs and using them to produce the maximum possible output.
 - D When resources are allocated in such a way that no redistribution of them can make any individual better off without making another individual worse off.
7. 'When firms in a society produce at minimum cost, choosing an optimal combination of inputs and using them to produce the maximum possible output.' Which of the following does this describe?
 - A Social efficiency
 - B Productive efficiency
 - C Allocative efficiency
 - D Economic efficiency
8. Economic efficiency is achieved when which of the following are both achieved?
 - A Allocative and productive efficiency
 - B Cost and technical efficiency
 - C Allocative and technical efficiency
 - D Productive and social efficiency

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Since the mid twentieth century, centrally planned economies have largely disappeared. The benefits of communism failed to materialise and the Soviet Union crumbled like the Berlin Wall. China, however, remains staunch in its commitment to centralisation. North Korea's economy is based on the complete elimination of markets and its focus on non-financial incentives to economic growth (e.g. to engage in productive behaviour via 'loyalty' to the nation state). Its decisions as to how to allocate different productive channels are decided centrally in the nation's capital Pyongyang by various committees. Food, clothing, and other resources tend to be rationed through public distribution systems present in the North Korean economy, but its purpose is mainly symbolic.

North Korea has faced many crises and economic problems throughout its existence. Its economy is stagnating and depreciating because of mismanagement and underinvestment in productive assets. There is a marked lack of growth in the agricultural sector which is crucial for the sustenance of the North Korean people. For example, North Korea suffered a famine and it is said that possibly up to 3 million people died. Food shortages are still common today – in 2004 UNICEF found that 57% of the population did not have enough food to stay healthy. Ironically, North Korea's legitimate name is the Democratic People's Republic of Korea, although the North Korean people have little chance of improving their situation through their government.

North Korea's economy is struggling. South of the border, though, the South Korean economy is thriving. South Korea allocates resources according to the market mechanism and economic growth is rapid. It has achieved its economic objectives. Despite the North and South Korean economies starting on an equal footing after the Korean War, South Korea is now the 11th largest economy in the world – its per capita income is high. Its resources are abundant – North Korea, however, comes in at only 113th.

9. Referencing the North and South Korean economies, evaluate the advantages and disadvantages of centrally planned economies compared to market economies.

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Topic Test 1.3: Opportunity Cost

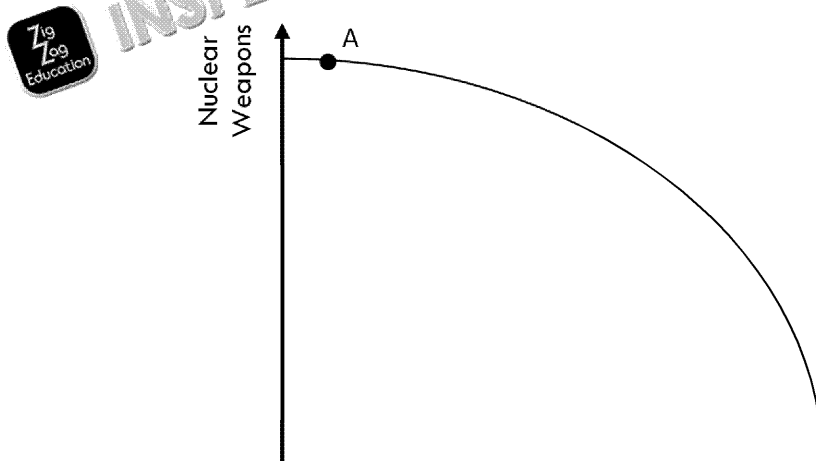
1. With reference to the concept of 'trade-offs', define the term opportunity cost.
2. What is meant by the production possibility curve (PPC)?
3. Table 1 displays information on the production possibilities of a fictional economy.

Table 1

Pizzas	Pastas
0	320
100	240
200	160
300	80
400	0

- (a) Draw the PPC for this economy.
 - (b) Using your PPC from (a) identify the following:
 - (i) Scarcity
 - (ii) Productive efficiency
 - (iii) Inefficiency
 - (c) What is the opportunity cost of producing 100 more pizzas if the economy is currently producing 200 pizzas and 160 pastas?
4. What two factors can cause the PPC to shift?

Suppose there is a fictional economy that has the option of producing nuclear weapons. The graph below shows the production possibility curve (PPC) for this economy and its current production point.



Producing nuclear weapons is an important feature of this society – after all, the threat of nuclear destruction might be the only rational defence strategy in a post-Cold War world. Superpowers such as the USA and Russia have the ability to annihilate nations. However, the population is growing rapidly and 44% of the population is living below the poverty line. If only implicitly at present, they would be much more satisfied with the current situation during this period of time.

5. Referencing the extract above, evaluate the benefits of productive and allocative efficiency.

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Topic Test 2.1–2: Specialisation, Trade and Demand

1. What is meant by specialisation?
2. Table 1 displays information about Adam and Karl's annual production

Table 1

Adam		Karl	
Vans	Wine	Vans	Wine
0	27	24	0
9	18	18	9
18	9	12	18
27	0	6	27
36	0	0	36

Using Table 2, explain how specialisation might encourage trade in an economy where the value of goods are of equal value.

3. Explain how money facilitates trade better than a barter system?
4. In 1776, Adam Smith's *The Wealth of Nations* was published for the first time in public. In it, Smith propelled to the forefront of economic thought the concept of specialisation. Smith's musing on the subject foresaw the specialisation of labour that would fuel the UK's Industrial Revolution. Smith noticed that dedicating oneself to the production of a single good was far less efficient than if the production process had been broken down into stages, with each person specialising on individual stages – that is, through specialisation much more could be produced than if we hadn't specialised. Indeed, he notes that 'the greatest improvement in the skill of any labourer, and the greatest part of skill, dexterity, and judgement with which it is applied, seem to have been the result of the division of labour.'

Using an appropriate example, discuss the role of specialisation in addressing the basic economic problem.

5. What is meant by *demand*?
6. What is the difference between individual and market demand?
7. Which of the following explanations describes the concept of *joint demand*?
 - A Demand for a certain item because it has multiple uses.
 - B Demand for an illicit substance.
 - C Demand for a certain item necessarily creates demand for a related item.
 - D Demand from the elderly for products that help them overcome the physical challenges of ageing.
8. Which of the following explanations describes the concept of *composite demand*?
 - A Demand for a certain item because it has multiple uses.
 - B Demand for a material made up from more than one constituent material.
 - C Demand for an item not because of the benefit derived from the item itself but because of its use in the production process.
 - D Demand for an item because it has a specific use.
9. If the price of Pepsi increases, consumer demand for Coca-Cola increases because Coca-Cola is a cheaper alternative. Which of the following is the name for this type of demand?
 - A Competitive demand
 - B Composite demand
 - C Joint demand
 - D Derived demand

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10. Table 2 shows information related to the demand for an organic food manufa

Table 2

Price	Quantity
£4.00	2,000
£3.50	3,000
£3.00	4,000
£2.50	5,000
£2.00	6,000
£1.50	7,000
£1.00	8,000
£0.50	9,000
£0.00	10,000

- (a) Draw the demand for this company's cartons of orange juice.
(b) If the price of an orange juice carton falls from £3 to £1, what would be the quantity demanded?

11. The law of demand states that 'ceteris paribus, there is an inverse relationship between the price of a product and the quantity demanded of it'. Explain why the demand curve is downward sloping.
12. Kopi Luwak is an expensive type of coffee that is made from part-digested coffee beans by a civet, an Indonesian mammal. State **three** factors that would shift the demand curve for Kopi Luwak.
13. What is the difference between an 'extension' and a 'shift' in demand?

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Topic Test 2.3: Supply

- What is meant by supply? (Distinguish between individual and market supply)
- Which of the following explanations describes the concept of *joint supply*?
 - Supply of a number of different items together as part of the same product
 - Supply of an item that serves more than one market (e.g. a product with multiple uses)
 - Supply where a firm can use its factors of production to make alternative products
 - Supply of products using manufacturing techniques such as 'buy one, get one free'
- Imagine that a farmer owns a processing plant that can produce a number of different products. The farmer has only one raw material to use as factor inputs for **one** of these products. The farmer must choose a single product to produce using its factors of production out of all the possible products.

Which of the following is the name of this type of supply?

- Joint supply
 - Competitive supply
 - Long-run supply
 - Composite supply
- Which of the following explanations describes the concept of *composite supply*?
 - Supply of an item that is complex to manufacture.
 - Supply of classical music compositions – e.g. 'Spring' by Vivaldi.
 - Supply of an item that serves more than one market.
 - Supply of a number of different items together as part of the same product
 - Table 1 shows information related to the market supply of a carton of six free-range eggs.

Table 1

Price	Quantity
£3.15	14,000
£2.70	12,000
£2.25	10,000
£1.80	8,000
£1.35	6,000
£0.90	4,000
£0.45	2,000
£0.00	0

- Draw the free-range egg market's supply curve.
 - What do you notice about the relationship between price and quantity supplied?
- Explain why the supply curve is *upward-sloping*.
 - What is the difference between a *shift in supply* and a *decrease in supply*?

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8. Table 2 outlines some factors that might influence the supply of apples from

Table 2

	Factor
(a)	The West Country orchard has invented a new technology of product harvest apples from the trees much faster than human labour without
(b)	UK farmers have received subsidies from the government to produce order to curb the UK's growing pest epidemic.
(c)	The price of pears on the market has increased relative to apples changes in consumer preferences.
(d)	Introduction of the National Living Wage in UK.
(e)	Previously, any apples that were bruised during the harvest process was no market for such damaged goods. However, recently technology bruised apples to be converted to bio-fuel. The market for bio-fuel is can fetch a pretty decent price for it.

Considering each change individually, how would you expect the supply of ap

California's almond industry is a growing market. In the 1970s, almond farmers produced pounds worth of almonds. Today, the industry's output is approximately 2 billion pounds. To produce less than this there is a perceived international shortage. In fact, almonds are in demand. This has incentivised many traditional Californian farmers – i.e. those that cultivate 'row crops' – to transform their farms to orchards.

However, there is a problem. California has experienced drought for the past five years. The winter brought about by El Niño much of California is normally dry. Californian farmers are parched and vegetation browned. Its cities have had to reduce water usage by a quarter. With little water resources there are less water, which is of course, significant for all of the agricultural industry because it is the lifeblood of the industry. Almonds are generally grown in the San Joaquin Valley. What this means is that water must be pumped from the Northern parts of the state to the industry in the south. However, unlike agricultural crops that cannot be planted in places with no water, almonds tree can survive. Almond farmers take up 8% of California's water supply – less than water for the other farmers.

Californian farmers, though, are learning to become more efficient in their production. They can monitor a host of factors that are important for crop growth, including the soil's moisture. For instance, can control the water supply to their crops via a smart phone. The implications for the agricultural industry are falling somewhat by reducing the need to purchase inputs like water.

9. Using a diagram, explain how these factors would affect the supply of traditi

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- [2 marks for a clear explanation of consumer surplus; 1 mark for an explanation of the general concept]

- [2 marks for a clear explanation of producer surplus, 1 mark for an explanation that generalises to other markets]

- [1 mark for each relevant economic observation, up to a maximum of 2]

- [1 mark for correct answer]

- [1 mar. 1999] correct response]

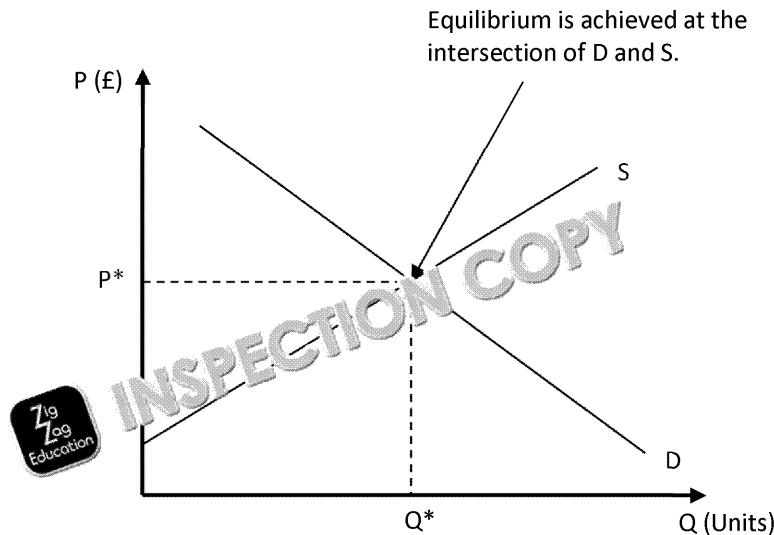
- [1 mark for correct definition]

- [1 mark for correct definition. Note, responses must involve the concept of a market. Students need not use this terminology]*

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(c)



[2 marks for correctly drawing a demand and supply diagram (with correct label of point of market equilibrium (i.e. the intersection of demand and supply); 1 mark for correctly identifying the equilibrium levels of price and quantity (i.e. P^* and Q^*)]

7. Assumptions underlying the model of supply and demand include: (1) competitive buyers and sellers so that all are price takers; (2) buyers and sellers have perfect information; (3) goods are identical; (4) private property rights are adhered to; (5) buyers and sellers act without overlap.

[1 mark for each correct assumption, up to a total of 3]

8. **C** – If demand decreases – that is, a *leftward* shift – then the equilibrium market price falls and there is a contraction of supply (a movement down the supply curve).

[1 mark for correct response]

9. **A** – If supply increases – that is, a *rightward* shift – then the area of producer surplus increases.

[1 mark for correct response]

10. **D** – At a wage rate of W_1 it can be seen from the diagram that the supply of labour ($L_D < L_S$). This is because the higher wage rate has encouraged workers to supply more labour than the prevailing wage (W_1). However, employers are not prepared to hire this many workers at the point that the wage is equal to their labour demand. Therefore, there is unemployment for this industry.

[1 mark for correct response]

11. **A** – If the demand for pounds increased the exchange rate would increase from £1 = \$1.50 to £1 = \$1.60. This implies that it would cost more dollars to purchase a single pound than before.

[1 mark for correct response]

12. Disequilibrium occurs whenever a market fails to clear. The implication of this is that there would be such that either demand exceeds supply or vice versa – that is, demand is not equal to supply. Disequilibrium could be caused by price controls, failure of firms to supply, or other social factors that might encourage firms to keep prices below the market clearing level.

[1 mark for correctly identifying that disequilibrium occurs whenever market prices are not equal to the market clearing price; 1 mark for identifying a cause (e.g. price controls)]

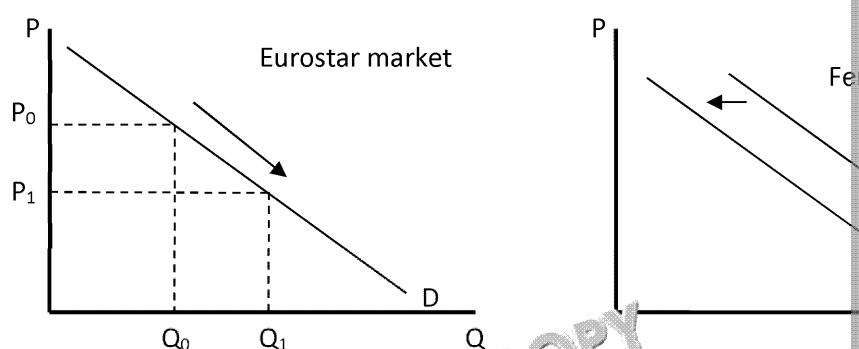
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13. If the price of Frisbees is P_1 this implies that the market is in disequilibrium because the clearing price is P^* . At P_1 the supply of Frisbees is greater than the market clearing quantity Q^* because consumers don't want to purchase as much as firms want to supply. Intuitively, this makes sense: when prices are high firms tend to supply more in order to maximise profit and consumers demand less because of real income and substitution effects. Therefore, with an excess stock, they must reduce their price so that more of their product is consumed. In the long run (assuming no shocks) the price will stabilise at P^* and the quantity at Q^* where demand equals supply.
14. Ferries and the Eurostar are very close substitute goods – or, their demand is 'co-moving'. If the price of one falls, the demand for the other will increase. For example, if the price of a Eurostar ticket has fallen, while a ferry ticket has risen over the course of a year. The Eurostar is now cheaper relative to the price of taking a ferry, so the demand for Eurostar tickets would increase during this period.

Graphically:



When the price of the Eurostar falls from P_0 to P_1 , this would encourage people to travel more towards the Eurostar market. Hence, the demand curve in the ferry market shifts leftward, indicating a decrease in demand for ferries.

[1 mark for recognising Eurostar and ferry travel are substitutes; 2 marks for correct price in the Eurostar market will affect demand of the other; a further 3 marks for appropriate explanation. Maximum 3 marks for this question.]

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Topic Test 2.6: Elasticity

1. C – Elasticity in economics refers to the *sensitivity* of something to something else. It has the same meaning in Economics. Rigidity is an antonym (opposite). Stretchiness is an antonym in Economic context.

[1 mark for correct response]

2. (a) Price elasticity of demand (PED) is the sensitivity or responsiveness, of demand to a change in a service's price level.

[2 marks for a clear explanation of PED; 1 mark for an explanation that is less than a full mark meaning]

- (b) $PED = \frac{\% \text{ Change in the Quantity Demanded}}{\% \text{ Change in the Price}}$

[2 marks for correct formula for PED; award only 1 mark if formula is defined in terms of percentage change; no marks if numerator and denominator are opposite to each other]

3. (a) $C - PED = \frac{\% \text{ Change in the Quantity Demanded}}{\% \text{ Change in the Price}} = \frac{-10\%}{40\%} = -0.25$

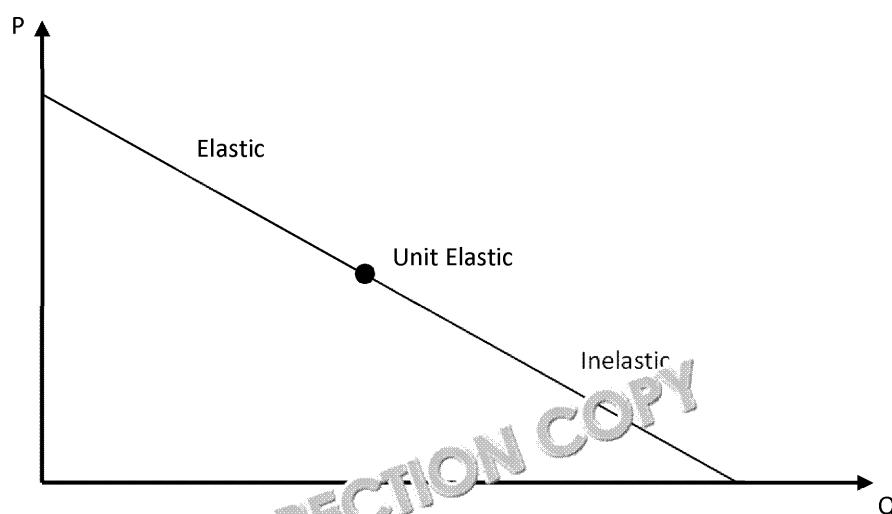
Therefore, the PED of petrol is inelastic. PED is *inelastic* if the calculated value is between 0 and 1 (in terms), it is perfectly inelastic if PED=0. Conversely, PED is elastic if PED>1 and perfectly elastic if PED<-1.

[1 mark for correct response]

- (b) A – Increase.

[1 mark for correct response]

4. PED varies along a straight line demand curve because the calculation involves price and quantity. Imagine that the nominal starting price of an item is high. If the price falls, the nominal change would be a small percentage change relative to the starting price. However, because the nominal quantity demanded is low at this point, a change in quantity demanded would be a large percentage change. Hence, in the upper half of a demand curve demand is said to be elastic. In the lower half of the demand curve – i.e. it is inelastic. Interestingly, at the midpoint of the curve demand is unitary elastic. Where demand intersects the y-axis, demand is perfectly inelastic. Where demand intersects the x-axis, demand is perfectly elastic.



*Note that the relationship between PED and elasticity is important in elucidating the relationship between PED and a firm's revenue. If demand is elastic, a firm can increase their revenue by reducing price and compensating this with a large increase in quantity demanded. If demand is unit elastic, the firm is maximizing its revenue. If demand is inelastic, any further reduction in price will lead to a smaller increase in quantity demanded, and reducing the price will lead to a smaller increase in revenue.

[2 marks for a clear explanation of why PED varies along a straight line demand curve; 1 mark for a less clear but conveys the general concept (e.g. slightly incorrect terminology used); 1 mark for a correctly drawn and labelled diagram]

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5. PED is influenced by...
- *Availability of Substitutes*: If there are suitable substitutes available for a product, demand is likely to be more elastic. Explanation of this relationship is that an increase in the price of a product encourages consumers to shift their consumption away from it towards the relatively cheaper substitutes available. However, the *magnitude* of elasticity will vary depending on the number and quality of substitutes are.
 - *Necessity*: If a product is a necessity then an increase in the price of the item will have a smaller effect on the demand. Therefore, items that are not thought of as necessities (e.g. foreign holidays) are more sensitive to changes in price because there are more alternatives available.
 - *Proportion of Income Devoted to the Good*: If the cost of an item constitutes a high proportion of a consumer's overall expenditure, then a small increase in its price is likely to have a large effect on the quantity demanded. That is, items that take up a larger share of our disposable income are more elastic. For example, a 1% increase in the price of a £100 item will have a larger effect on the quantity demanded than a 1% increase in the price of a £10 item.
 - *Time Period*: In the short run, demand tends to be inelastic because people have limited time to change their patterns of consumption, and so changes in price don't tend to affect demand as much as in the long run.

[1 mark each for identify an appropriate factor; 1 mark each for suitable explanation]

6. (a) Income elasticity of demand (YED) is the sensitivity, or responsiveness, of demand to a change in consumer income.

[2 marks for a clear explanation of YED; 1 mark for an explanation that is less than the general meaning]

(b)
$$YED = \frac{\% \text{ Change in the Quantity Demanded}}{\% \text{ Change in Income}} = \frac{-60\%}{15\%} = -4.00$$
 (i.e. Spam is an 'inferior' good)

[1 mark for correct answer; 1 mark for showing working]

7. 'Inferior' goods are those goods whose YED is negative – that is, when incomes rise the quantity demanded falls. Inferior goods have a YED < 0. For example, discount branded food. 'Normal' goods are goods which show a positive relationship between income and quantity demanded – most goods tend to be described as normal goods. Normal goods are the *opposite* of inferior goods. 'Superior' goods are goods for which YED is strongly positive (YED > 1). 'Luxury' goods are a special type of normal good for which YED is greater than 1.

[Up to 2 marks for an accurate description of an inferior, normal, and superior good; 1 mark for a comparison between goods – e.g. by using values of YED, examples, etc.]

8. (a) Public transport is an inferior good because its YED < 0 (-0.50) – this makes it an inferior good. As income rises, consumers might choose more luxurious modes of transport (e.g. cars).

[1 mark for correct response]

- (b) Automobiles. YED = 2.98 which is greater than the other products' values.

[1 mark for correct response]

- (c) Tobacco. YED is positive, therefore tobacco is a normal good.

[1 mark for correct response]

9. (a) Cross elasticity of demand (XED) is the sensitivity, or responsiveness, of demand for one good in response to a change in the price of another good or service's price level.

[2 marks for a clear definition of XED; 1 mark for an explanation that is less than the general meaning]

(b)
$$XED = \frac{\% \text{ Change in the Quantity Demanded of Good X}}{\% \text{ Change in the Price of Good Y}}$$

[2 marks for correct formula for XED; award only 1 mark if formula is defined in terms of percentage change; no marks if numerator and denominator are opposite to each other]

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10. **A** – Coal and BBQs are said to be complements if they have an XED of -0.54. This price of coal leads to a decrease in the consumption of BBQs. Note that this relationship is an option for the fuel for a BBQ.

[1 mark for correct response]

11. (a) Price elasticity of supply (PES) is the sensitivity, or responsiveness, of supply to a change in the service's price level.

[2 marks for a clear explanation of PES; 1 mark for an explanation that is less general meaning]

- (b)
$$PES = \frac{\% \text{ Change in Quantity Supplied}}{\% \text{ Change in the Price}}$$

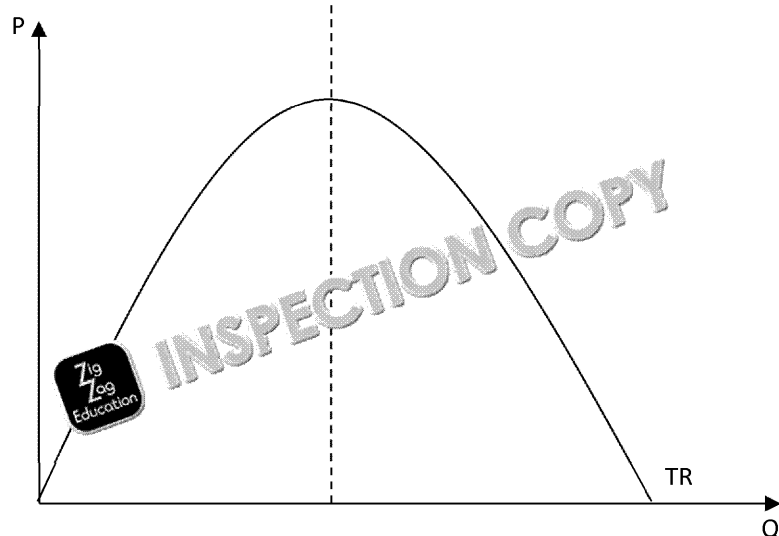
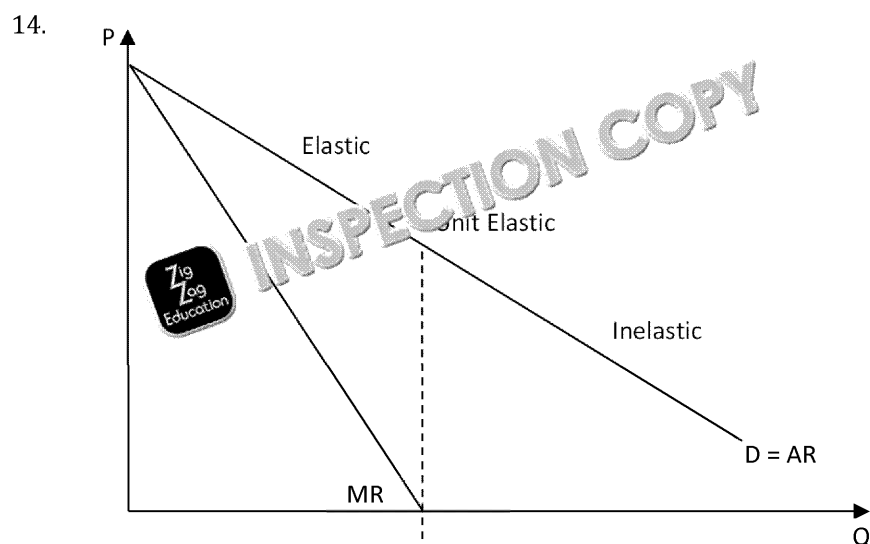
[2 marks for correct formula for PES; award only 1 mark if formula is defined as percentage change; no marks if numerator and denominator are opposite to each other]

12. **B** – The supply of Picasso's paintings can be represented by a vertical line because regardless of the price offered, there cannot be any more supplied to the market.

[1 mark for correct response]

13. A music streaming service would be almost perfectly *elastic* in the short-run. This is because once the service is set up, the provider will incur very few additional costs per unit, mainly

[1 mark for elastic; 1 mark for explanation]



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Notice that the price elasticity of demand varies along a straight line demand curve. In the upper half of the demand curve the price is *high*, while the quantity demanded *low*, so a *percentage* terms, but the associated change in quantity demanded would be large. The lower half of the demand curve is elastic, and the bottom half inelastic. Note that on the demand curve the price elasticity of demand will be *unit-elastic*.

If demand is price elastic, the firm can reduce its price but enjoy a disproportionate increase in its revenue. If demand is price inelastic, the firm can increase its price and increase its revenue. However, once demand is unit elastic, an increase or decrease in price will lead to a decrease in total revenue. Hence, total revenue is maximised when price and quantity demanded are at the point of unit elasticity. Notice that this is the point at which marginal revenue is zero. If the firm increases its price beyond this point, marginal revenue would lead to *negative* marginal revenue and so total revenue would decrease, and if the firm decreases its price below this point, total revenue would also decrease because the marginal revenue of increasing price would be negative.

[Maximum marks: 2 marks for explaining the relationship between a firm's PED and its total revenue relationship with a diagram.]

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Topic Test 2.8: Market Failure and Externalities

1. Market failure is said to occur when the interaction of free-market forces leads to allocation of society's resources.

[2 marks for a clear explanation of market failure; 1 mark for an explanation that is in general meaning. Note answer must focus on resources being allocated inefficiently]

2. If market failure occurs, production will be *inefficient*. Market failure's nature is the allocation of resources. It might be produced inefficiently – e.g. in the case of an externality, firms will not be maximising output given scarce resources. It might also be e.g. if there is over-production of a certain item.

[1 mark for identifying that market failure results in inefficiency; 1 mark for showing an example]

3. **D** – Market failure is rooted in an inefficient allocation of resources. It naturally follows that items will be under- or over-produced or consumed when market failure occurs. If resource allocation was perfect, items would be produced that exactly matched the preferences of society, and so there would be no over- or under-production, and markets would be operating perfectly.

[1 mark for identifying that market failure results in under- or over-production/consumption; 1 mark for logical reasoning]

4. **A** – The MPC of something is the change in total cost that affects only the first-party cost. e.g. the MPC of buying an apple will be *only* the money and time spent on purchasing it.

[1 mark for correct response]

5. The MPB of this individual's consumption of pizza is the benefit that accrues to that individual from the consumption – this could be the personal satisfaction of eating something that they like, the benefit of keeping starvation at bay, etc. 'Private' in this context means that it affects the sole individual, not the rest of society.

[1 mark for recognising that the benefit is that which accrues to the single individual; 1 mark for MPB in the context of a private good]

6. Marginal social cost, or MSC, is the incremental change in the total cost faced by society of an additional (marginal) unit of output. It encompasses both the marginal 'private' cost of production and the marginal 'external' cost of production.

[2 marks for a clear explanation of marginal social cost; 1 mark for an explanation that is in general meaning]

7. Marginal social benefit, or MSB, is the incremental change in the total benefit faced by society of an additional (marginal) unit of output. It encompasses both the marginal 'private' benefit of consumption and the marginal 'external' benefit of consumption.

[2 marks for a clear explanation of marginal social benefit; 1 mark for an explanation that is in general meaning]

8. **D** – Externalities are the costs and benefits that affect a third-party as the result of an economic activity. In other words, these are the costs and benefits that are *external* to the economic activity. Externalities can be both positive and negative and hence the definition must include both costs and benefits. It's all too easy to think externalities are only negative because these tend to be the most on in their research – try to avoid this pitfall if possible.

[1 mark for correct response]

9. (a) **Negative production externality**: industrial pollution is a negative production externality because it imposes a cost on a third party – e.g. people unhealthy and, thus, spend more on healthcare.
(b) **Positive consumption externality**: vaccinations are an example of a positive consumption externality because protecting oneself against disease has effects on both the individual and society.

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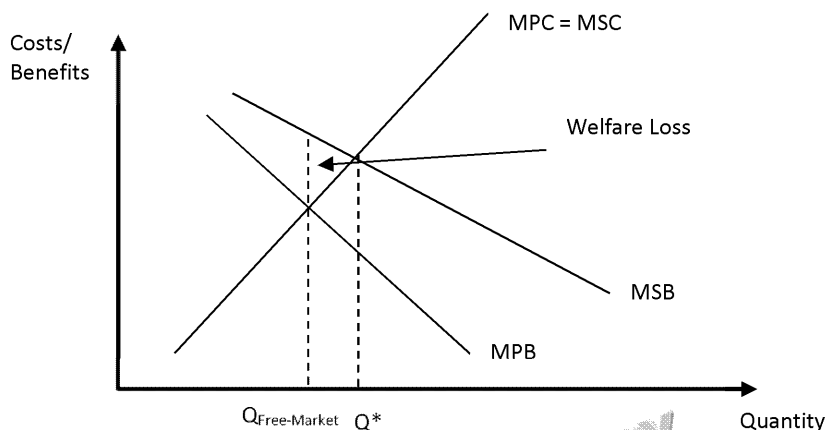


against contracting a disease then the benefit to the individual is explicit, but the benefit to society is that vaccinations can help prevent widespread health epidemics.

- (c) *Negative consumption externality*: smoking is an example of a negative consumption externality because smoking not only affects the private individual negatively, but also those around them. For example, people passively smoke if their parent or guardian is smoking, which can cause severe health problems. The benefit to society overall is reduced.
- (d) *Positive production externality*: research and development (R&D) is an example of a positive production externality because the research undertaken by a single firm has a positive effect on society. For example, an individual firm might invest in research into how to reduce the cost of distribution. Other firms will also benefit from the product of this research, and so the investment in R&D is a positive externality. The total cost to society is reduced.

[1 mark for each correct response]

10.



Employees undertaking voluntary specialisation training likely know the individual benefits of training – e.g. specialising and becoming highly productive is likely to lead to high wages. However, what these individuals are not likely to be aware of are the positive effects of training on society. If all individuals decided to undertake training, an equilibrium would be reached for the whole. The MPB of specialised training is less than the MSB for the whole. The position of the MPB and MSB curves on the diagram above with MSC shows that the socially optimum level of training is Q^* . The result of this analysis is that individuals taking into account only the private benefit of training will consume a level of education that is less than the socially-optimum level – that is, $Q_{\text{Free-Market}} < Q^*$. At Q^* , $MSB > MSC$ and so increasing Q would lead to some welfare gain because Samsung's training is underconsumed by its staff. Finally, there is a welfare loss because the market equilibrium is at $Q_{\text{Free-Market}}$ because welfare could be improved by more individuals undertaking training. The disparity between MSB and MSC is the welfare loss.

[Maximum of 3 marks for an appropriately drawn diagram; maximum of 3 marks for explanation]

11. Western firms outsourcing their production to cheaper economies such as India has led to the exportation of pollution and environmental degradation from Western economies to India.

It's clear from the extract that there is a relationship between industrial and agricultural production and climate change – e.g. there has been a 37% increase in global warming between 1990 and 2010. The environmental damage of production on a global scale has negative spillover effects on third parties. This is a negative production externality.

Example: The external costs of manufacturing internationally are *shrinking glaciers, unstable weather conditions, acid rain, and a loss of biodiversity*. Locally to India, the thick smog in its metropolitan cities, 1.2 million deaths per annum and a 3% loss of GDP.

Producers in India therefore create negative spillovers internationally and nationally. The reason that a negative externality exists is that producers only take into account the private costs of production – e.g. rents, wages, and costs of other factor inputs – but don't take into account the external costs that arise because they are not directly responsible for having to pay the price of the damage.

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[Maximum of 6 marks. 2 marks for identifying the type of externality in a correctly accurate comments analysing the question.]

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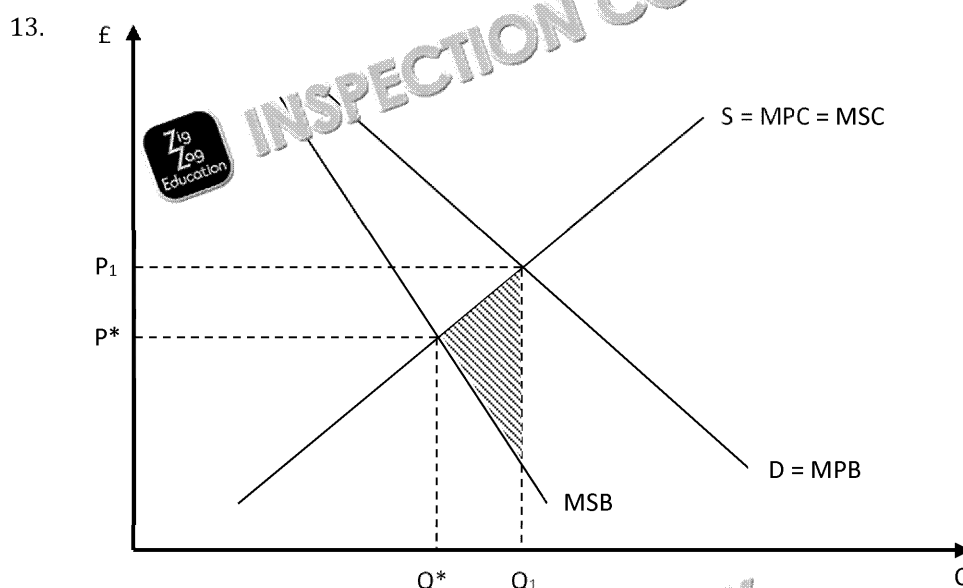
Externalities are defined as costs or benefits that arise from production or consumption that is external to the economic transaction. China's burning of coal to produce electricity is a *negative externality* because it arises from the supply side and has clear costs on the environment – e.g. deforestation, loss of biodiversity.

Diagrammatically, the demand curve for Chinese coal-derived electricity is equal to the marginal private benefit (MPB). However, the supply curve for coal-derived electricity is equal to only the marginal private cost (MPC) because electricity producers in China are unlikely to consider the external effect on the environment, only the internal costs of production. So, if operating the factory and producing electricity, because Chinese electricity producers do not include the external costs as part of their marginal cost curve, the marginal social cost (MSC) of production, which includes a firm's internal costs to the environment.

Chinese electricity firms will produce a quantity of electricity equal to Q_1 , determined by the intersection of the demand curve and the marginal private cost curve. Yet, because there is a disparity between private and social costs, the level of production is not consistent with the socially optimal level that would be at Q^* , determined by the intersection of the demand curve and the marginal social cost (MSC) curve. Notice that Q^* is above zero – this implies that the optimal level of pollution is one at which there is zero pollution, some pollution is beneficial if it means that coal can be used in other pursuits.

Note that 'allocative efficiency' occurs only when the price of something equals its marginal benefit. From a societal perspective this is at P^* where MSC – the true marginal cost – and MPB meet. The fact that the market equilibrium is at P_1 in the sense that allocative efficiency is not being achieved. Too much coal-derived electricity is produced because the price of this electricity doesn't reflect the true cost its production imposes on society. The shaded area represents the total loss to society.

[Maximum 6 marks. 5–6 marks for accurately illustrating and assessing how China's electricity causes environmental market failure, through a strong, well-supported economic analysis, might be underdeveloped or lacking in detail; 1–2 marks for a limited or unfocused or incorrect.]



Externalities are defined as costs or benefits that arise from production or consumption that is external to the economic transaction. Leaving litter behind in one of the UK's national parks constitutes a *negative consumption externality* because it arises from the demand side and has clear costs on other's enjoyment of the natural environment. It is important to note that the provision of natural resources with which we can produce output, but it is also a consumption resource that we can enjoy. Therefore, Economists are interested in situations in which environmental quality can be reduced.

Primarily, it is important to consider that an individual dropping litter in the UK's national parks is a *negative consumption externality*. To consider the impact of this action on other's enjoyment of the resource. It seems reasonable to assume that leaving a small amount of litter behind, but this could quickly reduce the benefit of the resource.

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tourists. Therefore, there is a wedge between the marginal private benefit (MPB) parks and dropping litter and the marginal social benefit (MSB) of dropping litter

If individuals are left to their own device they will drop Q_1 quantity of litter which is not the efficient level of Q^* . From society's perspective it would be better off if less people dropped litter as this would prevent other people's enjoyment of the natural environment from being reduced. There is a welfare loss to society that could be reduced by moving towards the socially optimal level of Q^* .

[Maximum 6 marks. 5–6 marks for clearly illustrating how leaving litter can cause a welfare loss to society; 3–4 marks for an attempt at evaluation, however it is lacking in detail; 1–2 marks for an attempt at evaluation, likely to be incorrect.]



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Topic Test 2.11a: Government Intervention

1. (a) 400,000; competitive free-market equilibrium level of output for the vodka is at the intersection of MPB and MSC – this occurs when $MPB = MSC = 80$, at 400,000

[Maximum of 2 marks. 1 mark for correct answer and 1 mark for identifying the intersection of MPB and MSC.]

- (b) 300,000; market failure occurs when there is a difference between MSB and MSC. $MSB = MSC = 40$.

[Maximum of 2 marks. 1 mark for correct answer and 1 mark for identifying the difference between MSB and MSC.]

- (c) 100,000; if the free-market output is 400,000, optimal allocation of resources is at the intersection of MSB and MSC, which is 100,000 units of output.

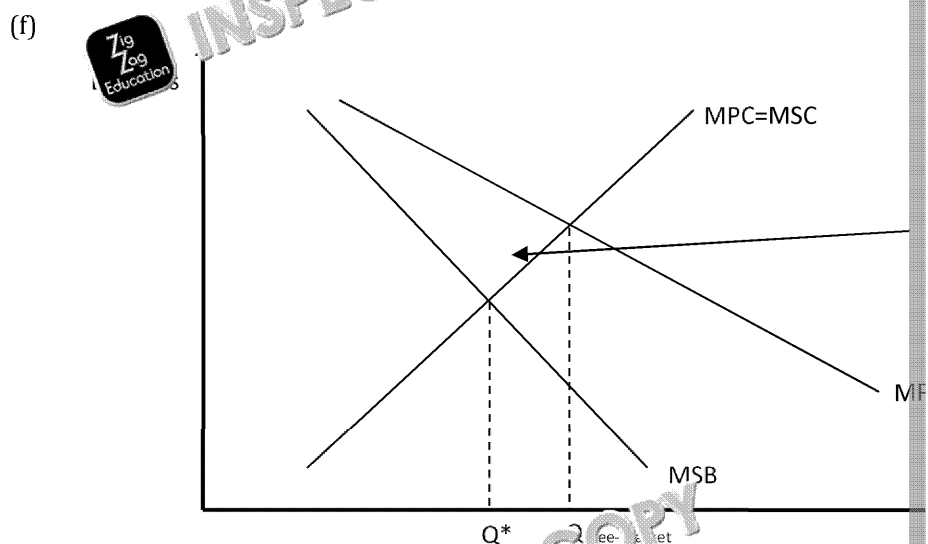
[Maximum of 2 marks. 1 mark each for correctly identifying the units for each difference in quantity between the two positions.]

- (d) 44; MPB at 400,000 is 80, MSB is 36, therefore the difference between these is 44.

[Maximum of 2 marks for correct answer]

- (e) The MPB of alcohol consumption is greater than its MSB because its consumption has negative externalities on society – e.g. alcoholism could lead to increased burden on the health service, violence, traffic accidents, noise pollution, and other anti-social behaviours. Consumers don't consider the external effects of their consumption on society – what matters to them is their private marginal benefit relative to their own marginal cost. Therefore, the quantity consumed in society will tend to be higher than the socially optimal quantity because consumers ignore the welfare effects. Note that because there is a disparity between MPB and MSB, there is a market failure in the market for alcohol.

[Maximum of 4 marks. Award marks for the clear understanding of the economic concept of market failure, using appropriate data where needed.]



[Maximum of 3 marks for appropriate, neatly drawn diagram]

- (g) Taxation, regulation, prohibition, etc.

[1 mark for an appropriate government response to a negative consumption externality]

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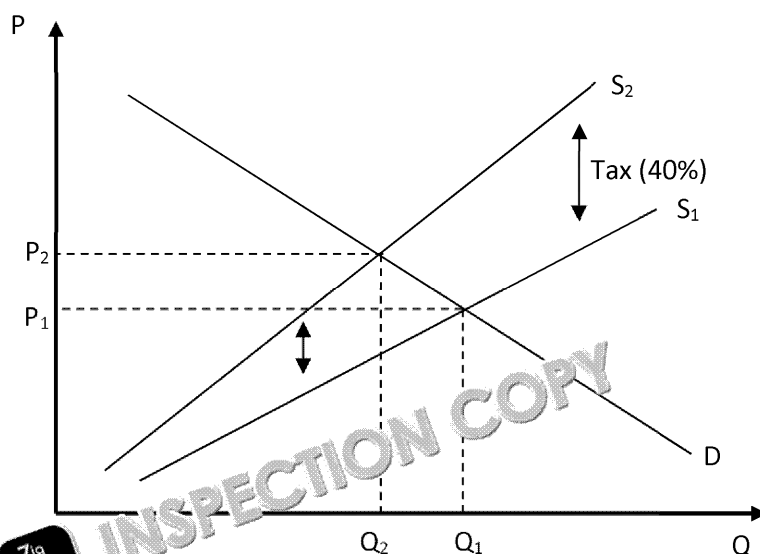
2. Governments have a fundamental role of providing a system of legislation that enforces property rights, contracts, and providing courts in which disputes can be resolved. Sometimes markets operate inefficiently and whenever there is a divergence between private and marginal social benefit (MSB) there is market failure. If market failure is occurring, a welfare improving intervention that brings MSC and MSB into equilibrium. There are two types of welfare improving intervention: 1. Government intervention refers to actions taken by governments in order to influence the behaviour of economic agents. 2. Market based intervention refers to the allocation of resources and bring about welfare improvements.

[3 marks for a clear explanation of the rationale for government intervention, distortion of operation of government and the intervention, and a convincing argument to correct market failure; 2 marks for a clear explanation but which conveys the meaning; 1 mark if there is no mention of government intervention or decisions that influence economic behaviour]

3. (a) *Taxation* – the government could increase taxation on fossil fuels in order to make them appear more cost-effective. Or, subsidies – the government could subsidise the cost of switching to electric vehicles in order to reduce the cost of switching.
- (b) *State Provision* – the government could make infrastructure investments to encourage private firms to make these investments, which is highly unlikely given the high costs.
- (c) *Buffer Stock System* – in order to reduce the volatility of prices of agricultural products, the government can introduce a 'buffer stock' system in which the government purchases excess production in a good harvest, and releases these during periods in which harvest is poor, thus stabilising the price.
- (d) *National Minimum Wage* – the NMW is a type of government *price control*, where the government forces employers to pay wages below the level that is deemed appropriate by the market.
- (e) *Prohibition* – the government could completely ban weapons in order to reduce the loss of life associated with guns. Or, regulation – the government could regulate the use of guns to limit their usage to, say, people that have undertaken mandatory psychological testing for legitimate reasons to use (e.g. hunters).
- (f) *Information Provision* – the government could counteract the market failure by making people aware of the health risks of consuming synthetic pesticides, this would in turn reduce consumption.

[1]  for identification of each appropriate government intervention. Note that the number of government interventions may be more than those listed for some of the scenarios.]

4. (a)

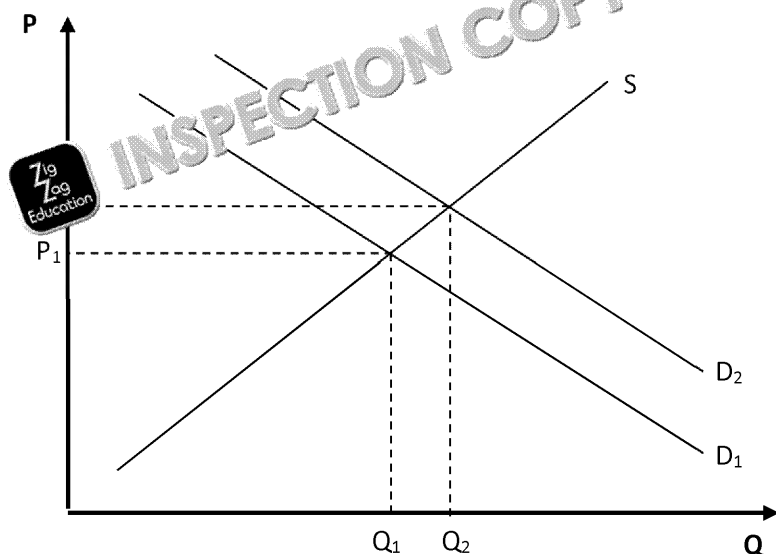


An **ad valorem** tax is a tax levied as a percentage of the selling price. Government tax causes a pivotal shift in the supply curve as S_1 rotates anticlockwise and because the absolute value of the tax differs according to the price of cigarettes more than 40% of £2. Thus, the increase to a cigarette manufacturer's cost varies with their cigarettes, and so their supply curve rotates. It should be obvious that this implies that they are willing to supply less of something at any given price than before.

this is represented by the inward shift of the supply curve. The effect of the decrease in supply that will result in a new market equilibrium where the price and the quantity has decreased from Q_1 to Q_2 as demand contracts.

[Maximum 6 marks. 2 marks for correctly drawing a demand and supply diagram; 1 mark for identifying the upward shift in the supply curve; 1 mark for identifying that an *ad valorem* tax will depend on the price; 2 marks for a clear explanation that supports the diagram.]

(b)



Since the *ad valorem* tax has increased the price of cigarettes, consumers are likely to substitute to alternative products, such as e-cigarettes that provide them with nicotine without as many harmful effects as actual cigarettes. Therefore, in the e-cigarette market, there is likely to be an increase in demand as consumers substitute away from the real cigarettes towards e-cigarettes – this is reflected by the demand curve shifting from D_1 to D_2 . Overall, the effect on the market for cigarettes is that the industry's output falls from Q_1 to Q_2 and the price too increases from P_1 to a higher level. If there wasn't such an increase in price, the demand over supply would be too high and consumers would gradually have to start offering more to entice these producers into sales.

[Maximum 6 marks. 2 marks for correctly drawing a demand and supply diagram; 1 mark for identifying that e-cigarettes is a substitute good; 1 mark for identifying that there is an increase in demand for e-cigarettes; 2 marks for a clear explanation that supports the diagram.]

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Topic Test 2.11b: Government Failure

- Government failure refers to a situation in which government intervention to correct market failure results in inefficiency and a further misallocation of resources, or at least has no effect on correcting the market failure.

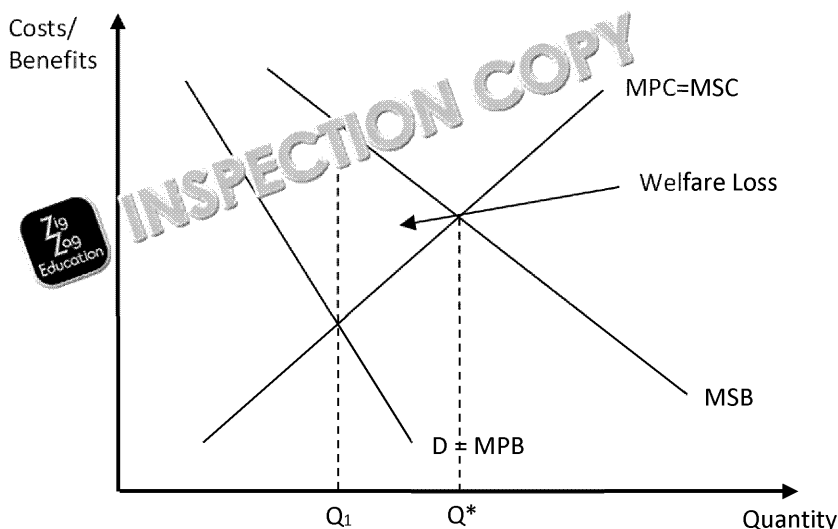
[2 marks for a clear explanation of a government failure; 1 mark for an explanation of the general meaning]

- Causes:

- Political self-interest – when policies are enacted that incur a political benefit but a net welfare loss (e.g. cutting taxes for a specific group that supports those in power due to lobbying from that group).
- Myopia – the policy short-sightedness. Governments often look for a short-term solution. For example, widening roads to reduce congestion is a short-term solution to alleviate traffic, however failure to identify the long-term problem of pollution is a failure in this sense.
- Regulatory capture – this cause of market failure occurs when the government is influenced by producers rather than consumers. An example of this type of failure is allowing producers to set prices.
- High enforcement/compliance costs – these could outweigh the benefits of government intervention.
- Red tape / bureaucracy – this type of government failure occurs when the costs of government enterprises such as the cost of meeting health and safety environmental law requirements are too high.
- Conflict of policy objectives – one policy objective may conflict with another. For example, lowering prices which may damage UK competitiveness.

[1 mark for each factor of government failure identified, up to a maximum of 3; 2 marks for explaining how each factor can cause government failure; 1 mark for an explanation that is less than the general meaning, up to a maximum of 6 marks]

- (a)



[1 mark for correctly labelled axes; 1 mark for appropriate choice and placement of curves; 1 mark for identification of market failure (e.g. through identifying welfare loss)]

- (b) It can be seen from the diagram above that the marginal social benefit of solar panels is greater than the marginal private benefit for all quantities. This is because there are external benefits of solar panels, such as energy conservation. If households are given a subsidy on solar panels this would constitute a positive externality. Their marginal private benefit becomes greater due to the financial benefit from the government's subsidy. Effectively, this would shift the marginal private benefit curve to the right, making it greater for each quantity of consumption. Importantly, this would shift the equilibrium quantity to Q*. However, whether the government has enough funds to provide this subsidy to this equilibrium is debateable.

[Maximum of 4 marks. 2 marks for identifying the correct method of government intervention; 2 marks for clear analysis and evaluation for the effect of the government's intervention on the market failure]

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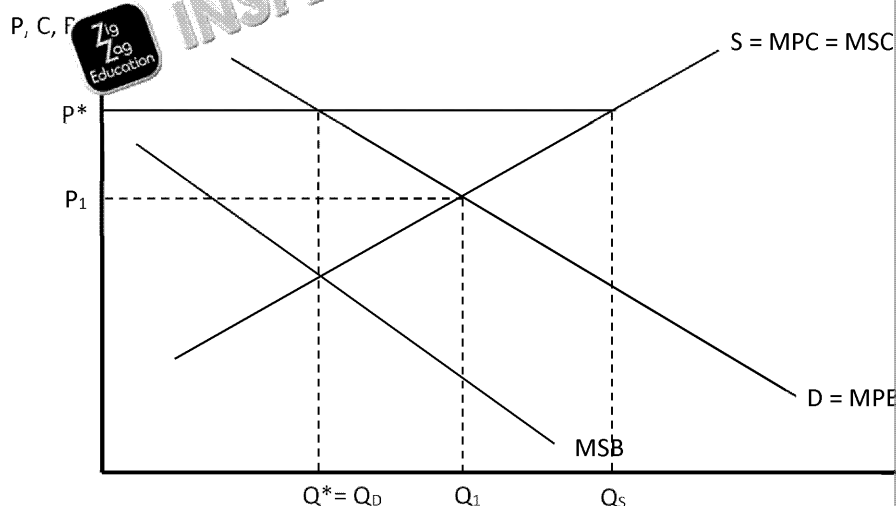
- (c) Subsidies are expenditure by the government. Governments have a limited budget and so subsidies must be funded through taxation. Therefore, the opportunity cost of the government resources that it could have spent on its other objectives – i.e. the next-best alternative.

[2 marks for a clear explanation of opportunity cost in the context of the exam question. 1 mark for an answer that is less clear but conveys the general meaning]

- (d) Example: government could incentivise a shift to renewable energies that is above the current market equilibrium.

[1 mark for appropriate response. Note that there are likely to be responses other than this.]

4.



Government intervention to impose a minimum price per unit of alcohol can be the result of a market failure. It controls the minimum price a producer can charge for their product. Graphically, this is represented by the intersection of demand and supply at (P_1, Q_1) . However this equilibrium is not efficient because there is a disparity between MSB and MSC ; the economy would be much better off if the price was higher. Since there is no market failure, the government can impose a minimum price which brings about the quantity consumed of Q^* at which markets would be operating efficiently.

The government's minimum price per unit of alcohol essentially modifies the shape of the supply curve. It is flat at P^* until it meets the original supply curve at Q_s and then it begins to slope upwards. At a price above P_1 , the supply of alcohol (Q_s) will outstrip the demand for alcohol (Q_D). Naturally, suppliers will supply more of a product when the price is high because there is an opportunity cost of not doing so. Demand is less because of the 'law of demand'. Ultimately, the ideal outcome for the market is a new market equilibrium at (P^*, Q^*) and the market failure is circumvented.

However, there are many avenues through which the policy could fail and, thus, the government must ensure that it has sufficient information to calculate a minimum price that is not too high or too low. First, if the minimum price is a price too high and MSB will exceed MSC , and vice versa, both of which represent a market failure. Second, it's possible that special-interest groups and lobbying could influence policy and prevent a sufficient price floor being implemented. Third, if the government sets a minimum price that is too low, there will be a natural surplus of supply, and therefore the suppliers that cannot sell their product will be forced to sell at a lower price than those who can't, and the excess supply represents resources that have been wasted. Fourth, if alcohol is disproportionately consumed by the poor then the minimum price will constitute a regressive form of taxation that worsens their position. (Note that there are many ways in which the government could fail.)

It is also possible to consider alternative policies with respect to alternatives – e.g. an alternative to a minimum price could be a tax on alcohol. Students should always assess the alternative relative to minimum price per unit of alcohol.

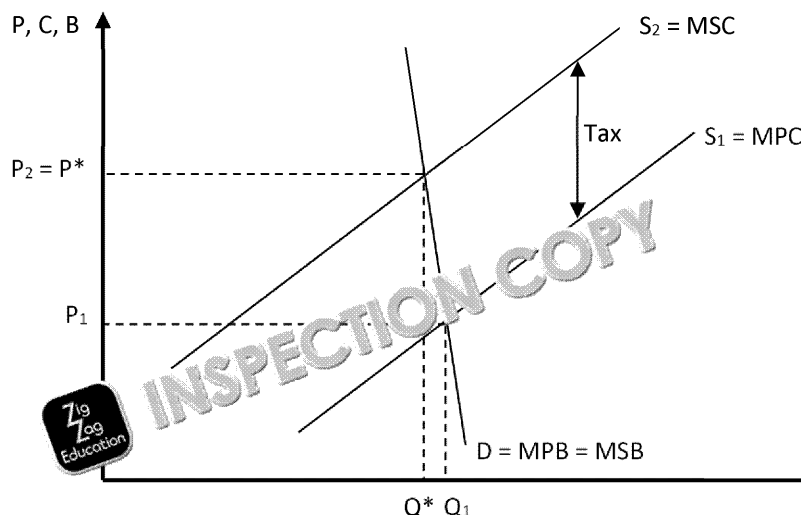
[Maximum of 10 marks. Maximum marks are awarded for strong answers with well-structured arguments, accurately to the question, using supporting data where needed and a clearly labeled evaluation.]

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5.



Usage of non-renewables creates negative externalities because their use contributes to environmental degradation. Therefore, there is a disparity between the MPC of supply and the actual MSC. The free market equilibrium will be at the intersection of demand and supply, resulting in a consumption of non-renewables at Q_1 is greater than the optimal allocation of resources at the intersection of MSC and MSB at (P^*, Q^*) .

The government, therefore, can intervene by imposing a tax on non-renewable fuels that reduces the amount of profit available to them at all prices, reducing their income. This is represented via an upward shift of the supply curve equal to the magnitude of the tax. The tax will outstrip supply and consumers would gradually offer more and more for fuel in the market. Producers, until the price reaches $P_2 = P^*$ and the market stabilises. At $P_2 = P^*$ a quantity Q^* is demanded and supplied and there will be no market failure.

However, there exists the opportunity for government failure. It might be difficult to implement the tax. It might be captured by special interest groups that prevent tax from being implemented. Fossil fuels is inelastic (i.e. there are few alternatives in the short-run) then such a tax is regressive – it is the poor who will suffer the most from the tax since it is uniform. A list is not exhaustive but students could offer many different reasons for government failure.

It is also possible to evaluate the policy with respect to alternatives – e.g. an alternative to a complete prohibition of fossil fuels, which could achieve the government's objective might do so at the expense of all production. However, students must always assess the government's policy of taxation.

[Maximum of 10 marks. Maximum marks are awarded for strong answers with well-grounded arguments, accurately to the question, using supporting data where needed and a clearly labelled diagram.]

6. Environmental market failure can be overcome by supplying tradable pollution permits. Governments can issue firms pollution permits, essentially awarding them the right to produce a certain quantity of pollution. Firms are then able to trade some portion of their permit if they produce more than their allocated quantity of pollution. Firms internalise the negative externalities of their product by trading permits because there is a real incentive to cut their individual pollution. First, if a firm has surplus permits from other firms which has the effect of increasing their costs of production, it would then be advantageous for this firm to decrease its pollution and increase production. Second, if not heavy polluters are able to sell their excess permits and earn extra revenue. In turn, they would be able to decrease their pollution more and increase their revenue. It pays to be a non-polluter if you have permits and so the forces of pollution that cause market failure can be overcome.

[2 marks for a clear explanation of how tradable pollution permits can correct environmental market failure. 1 mark for an explanation that is less clear but which conveys the general meaning]

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7. Advantages:

- **Incentives:** Primarily, the biggest benefit of introducing a system of tradable pollution permits creates incentive effects for both high- and low-polluters to reduce their pollution. Firms that are under-polluters have an incentive to reduce their pollution further and receive revenue by selling permits to over-polluters. Firms that are over-polluters have incentives to reduce pollution to increase production and improve profitability.
- **Government Controls Stock of Pollution:** Tradable pollution permits allow the governmental agency, to determine the stock of pollution that is permitted in a region. This makes sense because there is a quantitative limit on total pollution, whereas a pollution tax allows pollution over-and-above a level that is deemed socially optimal.

Disadvantages:

- **Difficulty Assessing Pollution Levels:** It is difficult for a central government to find a way to accurately measure pollution. Currently, there is little infrastructure in place that measures pollution. A cap on a firm's pollution might be ineffective.
- **Problems Quantifying Effects of Pollution:** It is difficult for a central government to determine the quantity of pollution for society. Information failure means that it is difficult to determine the true benefit of pollution because there is considerable difficulty in measuring the divergent private benefit and marginal social cost.
- **Circumvention:** It is possible that introducing a tradable pollution permit system could allow firms to circumvent measurement of pollution, rather than actually reducing pollution. This would be ineffective, especially if a firm's cost of circumvention is more cost-effective than the cost of reducing pollution.
- **Difficulties of Enforcement:** It is very costly to enforce a tradable pollution permit system. The administration costs can be exceptionally high. It might prove cost-ineffective to monitor pollution levels. Moreover, even if the government is able to monitor pollution levels, it is still costly to force firms to comply with regulations.
- **Inequality:** Firms differ greatly in terms of their revenue. Tradable pollution permits would benefit firms that are able to absorb the cost of purchasing additional permits to pollute. This would disadvantage firms that are not able to absorb these costs, or move quickly enough to reduce pollution.

[Maximum 4 marks. 2 marks each for a clear explanation of one advantage and one disadvantage of tradable pollution permits; 1 mark each for an explanation that is less clear but which conveys the main point.]



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