Please check the examination details below before entering your candidate information

Candidate surname	Other names
StemUp Model Solution	

Centre Number | Candidate Number

Pearson Edexcel International Advanced Level

Time 1 hour 45 minutes

Paper reference **WEC11/01**

Economics

International Advanced Subsidiary
UNIT 1: Markets in action

You must have:
Source Booklet (enclosed)

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **ALL** questions in Sections A, B and C.
- Answer **ONE** question in Section D.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*

Information

- The total mark for this paper is 80.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Calculators may be used.

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ▶

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SECTION A

Answer ALL questions in this section.

Questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

1 Which **one** of the following is a role of the government in a mixed economy?

- ☐ **A** To ration resources according to the price mechanism
- ☐ **B** To charge indirect taxes on goods with external benefits
- ☐ **C** To pay subsidies to manufacturers of goods that produce external costs
- ☒ **D** To introduce a tradeable pollution permit scheme to reduce external costs

(Total for Question 1 = 1 mark)

2 In 2019 an energy consumer in the UK could save an average of £290 by changing to a different energy supplier. In 2019 over 6.4 million households changed energy supplier.

Which **one** of the following could explain this behaviour?

- ☐ **A** Consumers being valued by the original supplier
- ☒ **B** Consumers aiming to maximise utility
- ☐ **C** Consumers being poor at computation
- ☐ **D** Consumers aiming to minimise utility

(Total for Question 2 = 1 mark)

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3 The table shows the price elasticity of demand for four household appliances.

Household appliances	Price elasticity of demand
Clothes dryers	−0.14
Dishwashers	−0.37
Refrigerators	−0.48
Washing machines	−0.32

(Source adapted from: https://www.osti.gov/servlets/purl/929429)

Which **one** of the following can be deduced from the table?

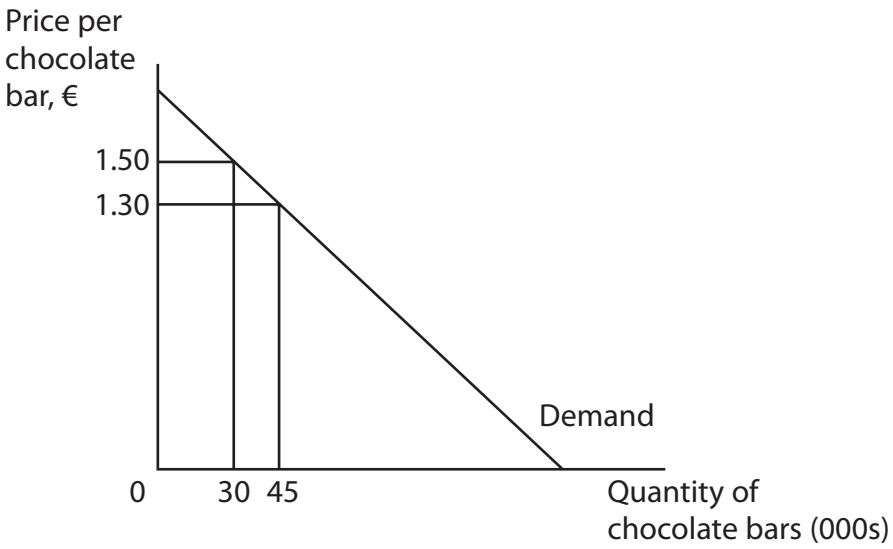
- ☒ **A** The demand for clothes dryers is price elastic
- ☒ **B** The demand for dishwashers is perfectly price inelastic
- ☒ **C** The demand for refrigerators is price inelastic
- ☒ **D** The demand for washing machines is perfectly price elastic

(Total for Question 3 = 1 mark)

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4 The diagram shows the demand curve for a chocolate bar in Spain.



Retailers reduce the price of the chocolate bar from €1.50 to €1.30.

Which **one** of the following can be deduced from the diagram?

☒ **A** Total revenue will rise by €13 500

☒ **B** Total revenue will rise by €58 500

☒ **C** Total revenue will decrease by €6 000

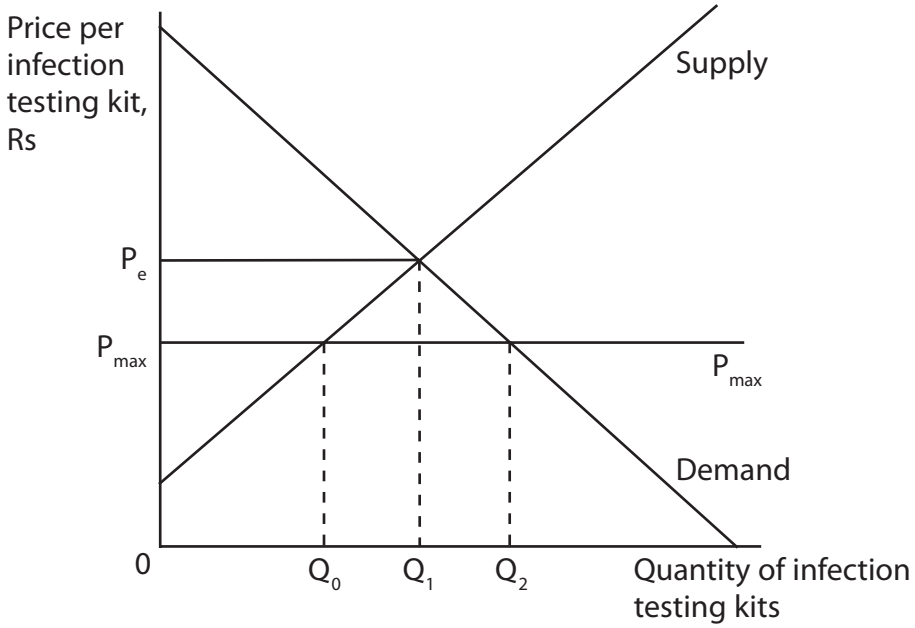
☒ **D** Total revenue will decrease by €45 000

(Total for Question 4 = 1 mark)

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5 The diagram shows the market for infection testing kits in Odisha, India.



The Government in Odisha imposed a maximum price, P_{max}, on infection testing kits.

Which **one** of the following can be deduced from the diagram?

- ☒ **A** Quantity supplied extends from Q_0 to Q_1
- ☒ **B** Quantity demanded contracts from Q_2 to Q_1
- ☒ **C** Excess demand will be equal to Q_0Q_2
- ☒ **D** Excess supply will be equal to Q_0Q_2

(Total for Question 5 = 1 mark)

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6 The table shows the cross elasticity of demand for selected drinks with respect to sugar-sweetened drinks in Chile.

Drink	Cross elasticity of demand
Water	+0.63
Milk	+0.25
Coffee	+0.12

(source: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-017-4098-x/tables/5)

Which **one** of the following can be deduced from the table?

☒ **A** The demand for coffee will be most responsive to a change in the price of sugar-sweetened drinks

☒ **B** The demand for water will be most responsive to a change in the price of sugar-sweetened drinks

☒ **C** An increase in the price of sugar-sweetened drinks will lead to a more than proportionate increase in the demand for milk

☒ **D** An increase in the price of sugar-sweetened drinks will lead to a decrease in the demand for water, milk and coffee

(Total for Question 6 = 1 mark)

TOTAL FOR SECTION A = 6 MARKS

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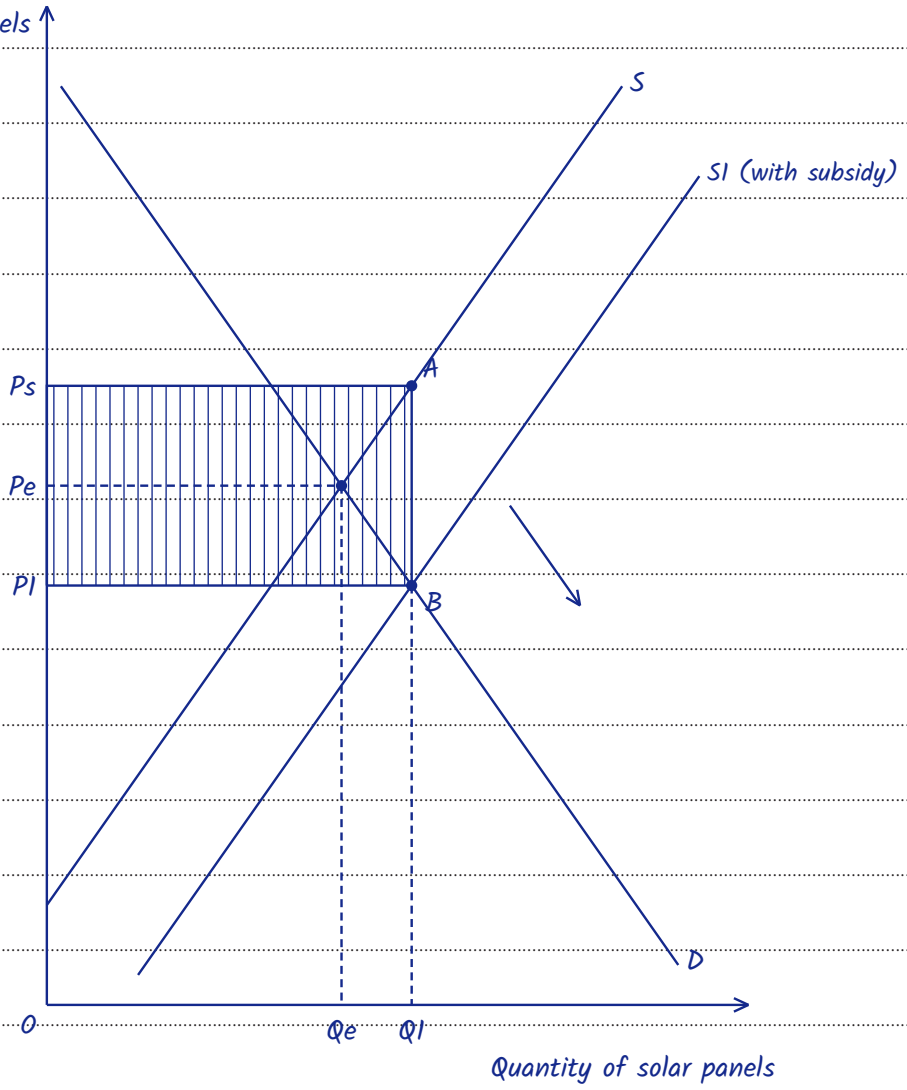
SECTION B

Answer ALL questions in this section in the space provided.

7 China aims to increase electricity generation from renewable resources. China's Government has introduced a subsidy for solar panel manufacturers.

Draw a diagram to illustrate the impact of the introduction of a subsidy on the market for solar panels.

Show the new equilibrium price and quantity and the area of government expenditure on the subsidy in your diagram.



The subsidy lowers producers' costs, so supply shifts right from S to SI. Equilibrium moves from Pe, Qe to a lower price PI and a higher quantity QI. Government spending on the subsidy is the shaded area PIPsAB (subsidy per unit AB × quantity QI).

(Total for Question 7 = 4 marks)

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8 The table shows the change in the sales of capital goods and consumer goods compared to the previous month in the USA.

	Capital goods	Consumer goods
April 2020	–6.5%	–14.7%
May 2020	+2.3%	+17.7%

With reference to the table, explain the difference between 'capital goods' and 'consumer goods'.

Capital goods are man-made goods used in the production of other goods and services, such as machinery, tools, vehicles and factory buildings. Consumer goods are goods bought by individuals and households to satisfy their own wants and needs, such as food, clothing and televisions.

In the USA, sales of capital goods fell by 6.5% in April 2020 compared with March and then grew by only 2.3% in May 2020, whereas sales of consumer goods fell much more sharply, by 14.7% in April, but then recovered strongly, rising by 17.7% in May 2020.

So consumer goods sales were far more volatile, because household spending responds quickly to changes in income and confidence, while firms buy capital goods for long-term production.

(Total for Question 8 = 4 marks)

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9 Most of the Netherlands is below sea level and is therefore liable to flooding. The Dutch Government spends €1 billion per year on flood defences.

Explain **one** reason for the provision of this public good by the Dutch Government.

A public good is a good that is non-excludable (once provided, people cannot be stopped from benefiting from it, even if they do not pay) and non-rival (one person's use does not reduce the amount available to others).

Flood defences are a public good: once they are built, every household and firm in the protected area of the Netherlands is safe from flooding, and protecting one more household does not reduce the protection for anyone else.

One reason the Dutch Government provides them is the free rider problem. Because flood defences are non-excludable, people can benefit from them without paying, so rational consumers have an incentive to let others pay. A private firm therefore could not charge users or generate enough revenue, so there is no profit incentive and the free market would not provide flood defences at all, a complete market failure (missing market). This is why the government provides them, spending €1 billion per year funded through taxation.

(Total for Question 9 = 4 marks)

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10 The table shows the quantity of coffee beans supplied globally and average coffee bean prices in 2019 and 2020.

	Average price of coffee beans, per pound (lb)	Quantity of coffee beans supplied, million bags
2019	$1.36	169.0
2020	$1.02	167.4

Ceteris paribus, calculate the price elasticity of supply for coffee beans.
Show your workings.

PES = % change in quantity supplied ÷ % change in price

% change in quantity supplied = (167.4 − 169.0) ÷ 169.0 × 100

= −1.6 ÷ 169.0 × 100 = −0.947%

% change in price = (1.02 − 1.36) ÷ 1.36 × 100 = −0.34 ÷ 1.36 × 100 = −25%

PES = −0.947 ÷ −25 = +0.038 (about 0.04)

PES is positive but much less than 1, so the supply of coffee beans is very price inelastic: a 25% fall in price led to less than a 1% fall in quantity supplied.

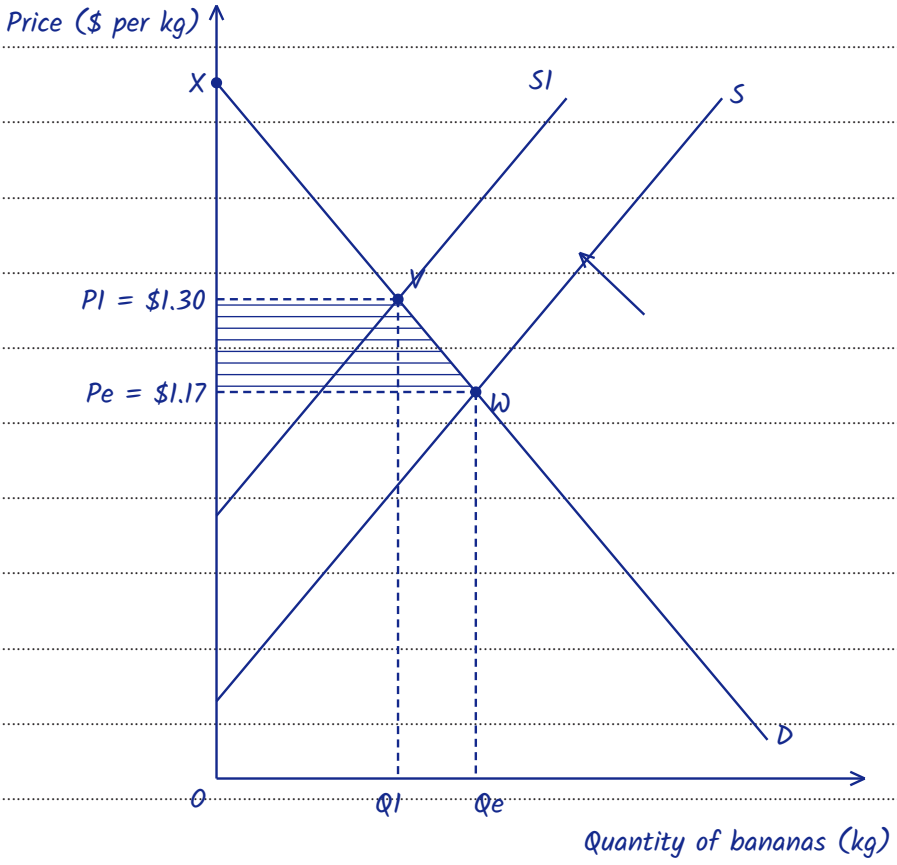
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11 Between January 2020 and May 2020 the price of bananas charged by retailers in the USA increased from $1.17 to $1.30 per kg. This was mainly caused by increased costs of transportation from banana growers to markets in North America.

Explain the likely impact of this change in price on consumer surplus.

Illustrate your answer with a diagram.



Consumer surplus is the difference between the price consumers are willing to pay and the price they actually pay. Higher transport costs shift supply left from S to S1, so the price rises from $1.17 to $1.30 per kg (11.1%) and quantity falls from Qe to Q1. Consumer surplus falls from PeWX to P1VX, a loss of the shaded area PePIVW.

(Total for Question 11 = 4 marks)

TOTAL FOR SECTION B = 20 MARKS

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SECTION C

Study Figure 1 and Extracts A, B and C in the Source Booklet before answering Question 12.

Write your answers in the space provided on the following pages.

12 (a) Define the term 'complementary goods' (Extract A, line 8).

(2)

(b) With reference to Figure 1 and Extract A, analyse why 'between January and May 2020 the world price of rubber fell from $1.67 to $1.35 per kg'.

Illustrate your answer with a supply and demand diagram.

(6)

(c) With reference to the first paragraph of Extract B, explain what is meant by 'the supply of rubber is price inelastic'.

(4)

(d) Examine the effect on producer surplus of the change in market conditions for rubber gloves as described in Extract C. Include a diagram in your answer.

(8)

(e) With reference to Extract B, discuss the external costs associated with tyre production and consumption.

(14)

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12 (a) Define the term 'complementary goods' (Extract A, line 8).

(2)

Complementary goods are goods that are used or consumed together (joint demand), so they have a negative cross elasticity of demand: a rise in the price of one leads to a fall in demand for the other, for example cars and tyres.

(b) With reference to Figure 1 and Extract A, analyse why 'Between January and May 2020 the world price of rubber fell from $1.67 to $1.35 per kg'.

Illustrate your answer with a supply and demand diagram.

(6)

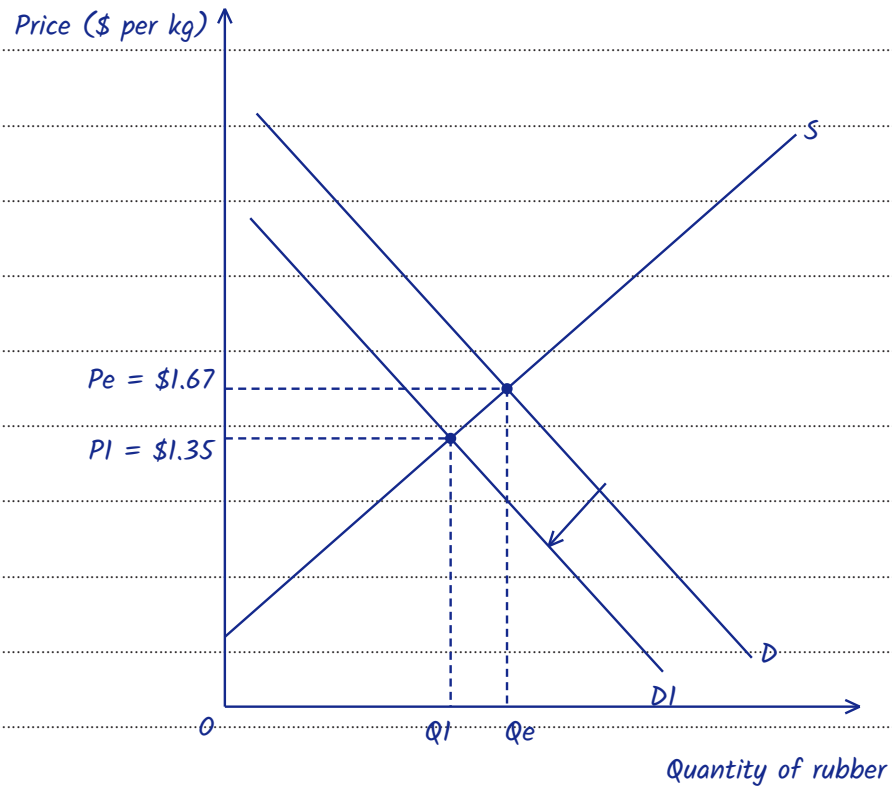


Figure 1 shows the world price of rubber fell by $0.32 per kg, or 19.2%, between January and May 2020. This was caused by a fall in demand for rubber, shown by the shift from D to D1.

Car factories temporarily closed, so fewer cars were made and car usage fell, meaning fewer tyres needed replacing. Because cars and tyres are complementary goods, the fall in demand for

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cars reduced the demand for tyres: tyre sales fell by 35% in Europe, 42% in North America and 33% in South America. Rubber has a derived demand from tyres, and tyre production uses 75% of the world's natural rubber, so demand for rubber fell significantly. At Pe there is excess supply, so the price falls to P1 and the quantity traded contracts from Qe to Q1.

(c) With reference to the first paragraph of Extract B, explain what is meant by 'the supply of rubber is price inelastic'.

(4)

Supply is price inelastic when a change in price leads to a less than proportionate change in quantity supplied, so PES is between 0 and 1. Producers cannot respond quickly to a change in price.

Rubber trees take 6 years to produce their first crop, so if the price of rubber rises, farmers cannot quickly increase output; new trees planted now will not supply rubber for years. Rubber trees also only grow well where there is heavy rainfall and temperatures between 20°C and 35°C, so production cannot easily move to other areas.

As a result, 85% of the world's natural rubber comes from farmers in only a few places (Thailand, Indonesia, China and West Africa), so the quantity supplied responds only a little to changes in price, at least in the short run.

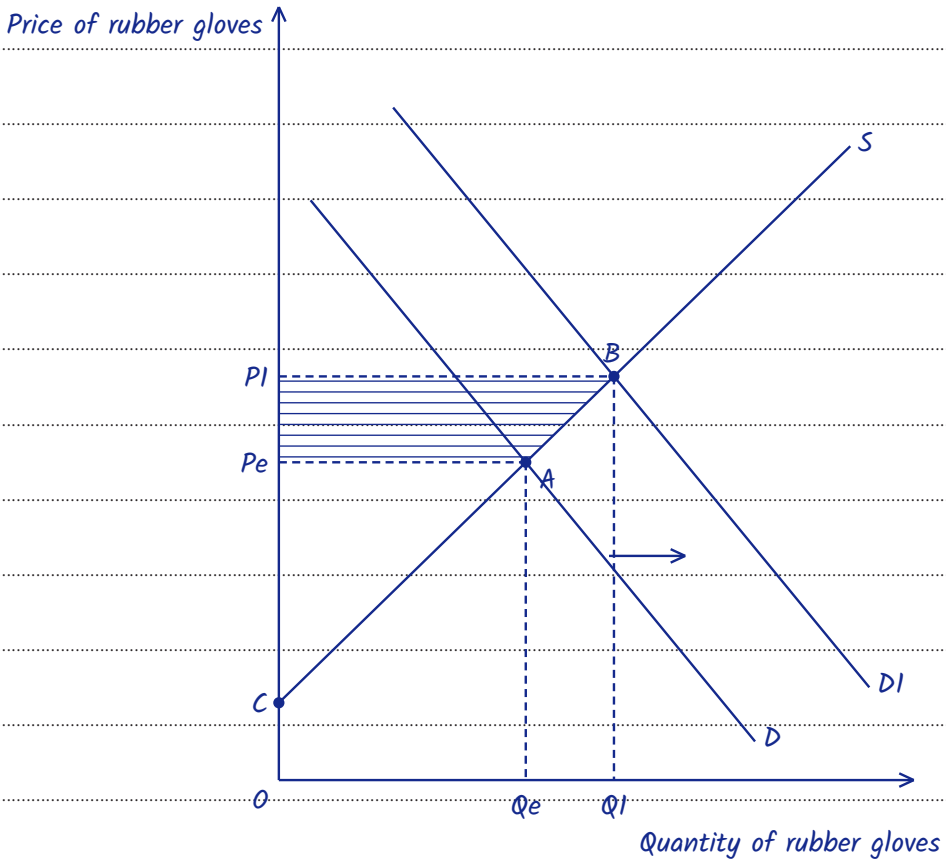
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(d) Examine the effect on producer surplus of the change in market conditions for rubber gloves as described in Extract C. Include a diagram in your answer.

(8)

Producer surplus is the difference between the price producers are willing to sell at and the market price they actually receive. It is the area above the supply curve and below the price.



Extract C shows rapidly rising demand for rubber gloves across the world, with a substantial increase in sales to the healthcare sector. Demand shifts right from D to D1. At the original price Pe there is excess demand, so the price rises to P1 and quantity extends from Qe to Q1.

Producer surplus increases from CAPe to CBP1, a gain of the shaded area PeABP1. Producers gain because they receive a higher price on the units they were already selling (Qe) and they also sell more units (QeQ1), each sold at a price above the minimum they would accept. This is reflected in Top Glove's 366% increase in profits in the second quarter of 2020.

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However, the size of the gain depends on the price elasticity of supply. If glove manufacturers have spare capacity, supply is elastic, so the increase in demand mainly raises output and the rise in price, and so in producer surplus per unit, is smaller. If supply is inelastic in the short run, the price rises much more and the gain in producer surplus is larger.

The gain may also be temporary. The rise in demand from healthcare was linked to the pandemic, so once it ends demand may fall back towards D, reducing producer surplus. In addition, producing more gloves may raise costs, for example rubber, labour and overtime, and the 366% rise in profit is for one firm in one quarter, so it may not represent all glove producers. Overall, producer surplus has risen significantly in the short run, but the long-run effect depends on how long the high demand lasts.

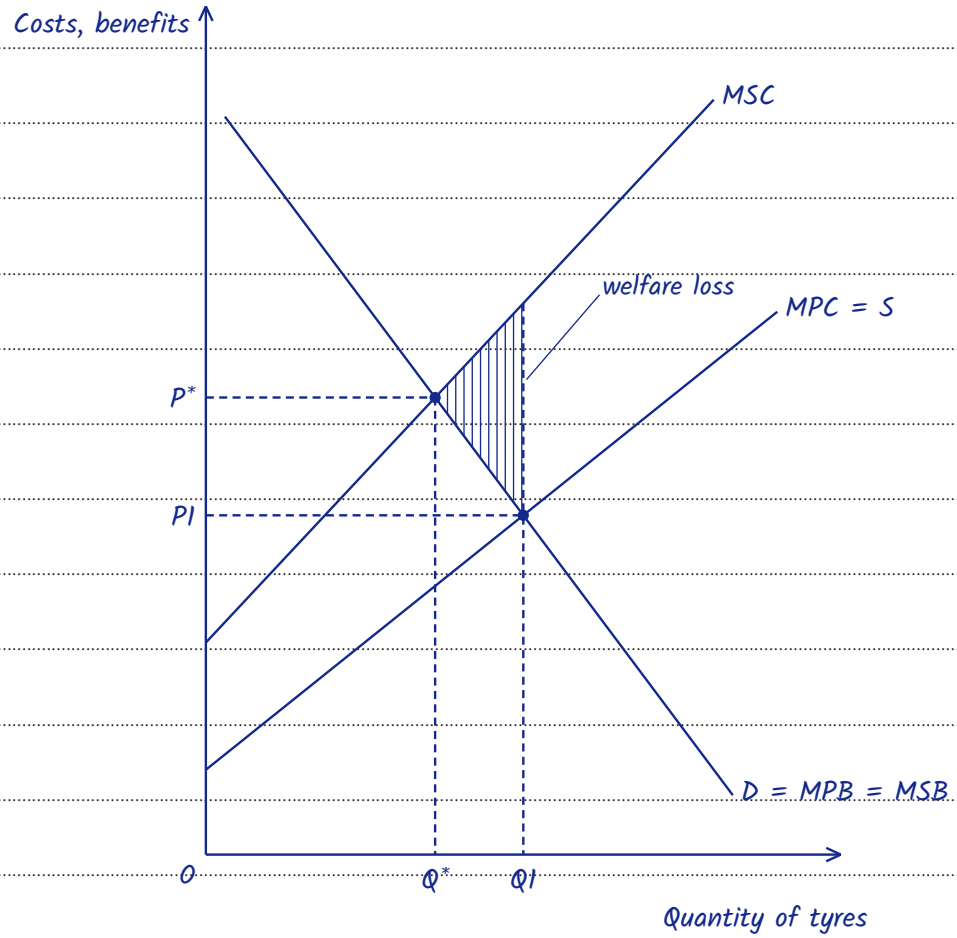
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(e) With reference to Extract B, discuss the external costs associated with tyre production and consumption.

(14)

External costs are negative effects of production or consumption on third parties who are not involved in the transaction and are not compensated. They mean that marginal social cost (MSC) is greater than marginal private cost (MPC), because MSC = MPC + external cost.

In production, tyre production uses 75% of the world's natural rubber, and rising demand for tyres between 2000 and 2019 led to deforestation: 3 million hectares of forest in the Mekong region of South East Asia were cleared for rubber plantations. This destroys natural habitats, reduces biodiversity and the possible future medicines that come from forests, and releases carbon dioxide that contributes to climate change. Rubber producers and tyre buyers do not pay for these costs, so the free market price is too low and too many tyres are produced.



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The free market produces Q1 where MPB = MPC, but the social optimum is Q^* where MSB = MSC. So there is overproduction of Q^*Q1, and the shaded triangle is the welfare loss to society.

In consumption, tyres wear down when cars are driven. A study found that tyres emitted 1 000 times more PM2.5 particles than exhaust fumes. Long-term exposure to PM2.5 causes respiratory diseases and reduced lung function in children and adults, a higher risk of lung cancer, and cardiovascular disease causing strokes. Third parties such as pedestrians and local residents suffer worse health, the healthcare system faces higher costs, and the economy loses output as workers are ill or die early. Used tyres sent to landfill release chemicals and heavy metals that cause cancer and genetic mutations, so governments face clean-up costs.

However, the evidence should be treated with caution. The study was based on testing only one fully loaded car on one type of road surface, so it may not be reliable: lighter cars or smoother roads may produce far fewer particles, so the true external cost may be much lower or higher. External costs such as damage to health and biodiversity are also very hard to measure and put a monetary value on.

The external costs of disposal are also falling. Tyre recycling reduced tyres in landfill from one billion in 1991 to 60 million in 2018. In the USA 43% of recycled tyres are used to produce energy, giving 25% more energy than coal, and the ash is less polluting than burning coal, so recycled tyres may even reduce external costs if they replace coal. Innovation in tyre technology may also reduce particle emissions in future.

On the other hand, the magnitude of the external costs is still likely to be significant, because there are so many cars on the roads and the health costs build up over a long time, while deforestation is hard to reverse. Overall, the external costs of tyre consumption through PM2.5

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are probably the most serious, but their exact size is uncertain, while recycling is reducing the costs of disposal.

(Total for Question 12 = 34 marks)

TOTAL FOR SECTION C = 34 MARKS

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SECTION D

Answer ONE question from this section.

Write your answer in the space provided.

EITHER

13 In 2018 the Government of Uganda introduced an indirect tax on mobile internet usage. The aim was to raise tax revenue. Consumers had to pay a tax of 200 shillings per day to use services including Facebook, Twitter and Instagram. In the six months that followed the introduction of the tax, mobile internet usage decreased from 47.4% to 35% of the population.

Evaluate the likely microeconomic effects of the introduction of this indirect tax.

(Total for Question 13 = 20 marks)

OR

14 In 2019, in Sweden, on average:

- households saved 16.5% of their incomes
- households borrowed 189% of their incomes
- a consumer made 349 debit card payments.

With reference to the information above and your own knowledge, evaluate the role of financial markets in an economy.

(Total for Question 14 = 20 marks)

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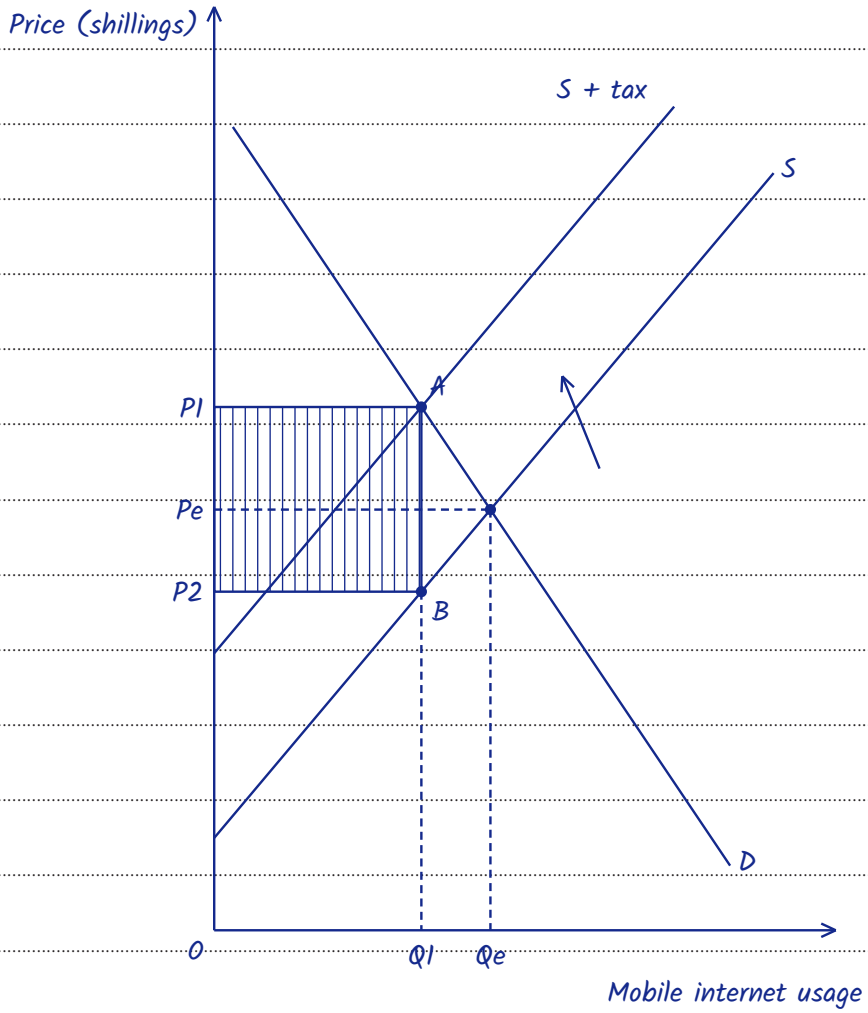
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Indicate which question you are answering by marking a cross in the box ☒. If you change your mind, put a line through the box ☒ and then indicate your new question with a cross ☒.

Chosen question number: **Question 13** ☒ **Question 14** ☐

Write your answer here:

An indirect tax is a tax on expenditure on goods and services, paid to the government by producers, who pass some of it on to consumers in higher prices. The Ugandan tax is a specific tax, a fixed amount of 200 shillings per day, so the supply curve shifts vertically upwards by the tax, parallel to the original supply curve.



The tax raises the cost of supplying mobile internet access, so supply shifts from S to S + tax. The price paid by consumers rises from Pe to P1 and the quantity consumed falls from Qe to Q1. This is shown by the fall in mobile internet usage from 47.4% to 35% of the population, a fall

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of 12.4 percentage points or about 26% of users. Consumers lose consumer surplus because they pay more and consume less, which reduces their access to information and communication.

Producers, such as mobile network operators, receive only P2 per unit after paying the tax, so the price they receive falls from Pe to P2 and they sell less. Their revenue and producer surplus fall, and lower profits may lead to job losses and less investment in networks. Facebook, Twitter and Instagram may also earn less advertising revenue as fewer Ugandans see adverts, and small businesses that use social media to market their goods face higher costs.

The government gains tax revenue equal to the shaded area P2PIAB (tax per unit AB × QI), which meets its aim. The incidence of the tax is shared: consumers pay PePI per unit and producers pay P2Pe. The revenue could be spent on infrastructure, education or healthcare, creating external benefits. However, because output falls from Qe to QI, there is a deadweight welfare loss, as some consumers who valued the service above its cost no longer use it.

However, the size of these effects depends on the price elasticity of demand. The 26% fall in users suggests demand is fairly price elastic, as there are substitutes such as calls, text messages and free wifi. If demand is elastic, the quantity falls a lot and the tax base shrinks, so the government raises less revenue than it expected, which conflicts with its aim. Producers would also bear more of the tax. If demand were inelastic, revenue would be higher and most of the tax would fall on consumers.

The magnitude of the tax also matters. 200 shillings per day may be a small amount for high-income users, or for business users whose costs are paid by their employer, but a significant share of income for poorer households, so the tax is regressive and may widen inequality and the digital divide. The fall in usage is likely to be concentrated among low-income

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groups.

There is also a risk of government failure. The government may lack information and set the tax at the wrong level. There may be unintended consequences: people may avoid the tax, for example by using VPNs or illegal access, so the fall in measured usage overstates the fall in actual use and revenue is lower. Administration costs of collecting a daily tax may also be high, and the revenue could be misused rather than spent on public services.

The data also has limitations. It only shows the share of the population using mobile internet, not the time spent online, and it covers only the first six months, so it shows the short run. Other factors may also have changed over the period (ceteris paribus may not hold). In the long run consumers may adjust, so usage could recover.

In conclusion, the tax is likely to raise some revenue, but because demand appears to be price elastic and avoidance is possible, it significantly reduces consumer and producer surplus and access to the internet, especially for poorer groups. The overall effect depends mainly on the elasticity of demand and on how the government spends the revenue; a smaller tax, or a tax on goods with external costs, may achieve the revenue aim with fewer harmful effects.

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TOTAL FOR SECTION D = 20 MARKS
TOTAL FOR PAPER = 80 MARKS

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Pearson Edexcel International Advanced Level

Time 1 hour 45 minutes

Paper reference **WEC11/01**

Economics

International Advanced Subsidiary
UNIT 1: Markets in action

Source Booklet

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Total Marks

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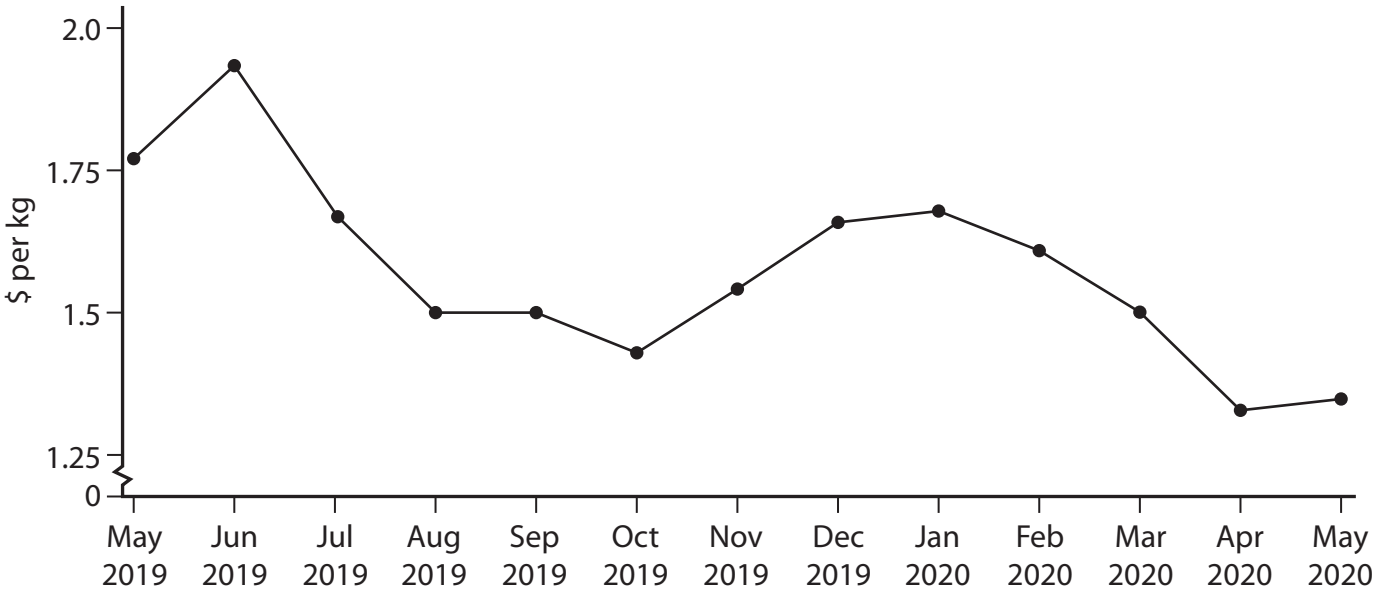
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Sources for use with Section C.

The markets for rubber, tyres (tires) and rubber gloves

Figure 1 World price of rubber, US$ per kg, May 2019–May 2020



Extract A Rubber price falls as car and tyre production fall

Between January and May 2020 the world price of rubber fell from $1.67 to $1.35 per kg. This was caused by a significant decrease in demand for tyres that are made from rubber. Tyre production uses 75% of the world's natural rubber.

Over the same period, tyre sales fell by 35% in Europe, 42% in North America and by 33% in South America. There was a large decrease in car production in all of these regions as a result of the temporary closure of car factories. Car usage also fell, resulting in fewer tyres needing to be replaced. Cars and tyres are complementary goods.

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Extract B Rubber production and pollution from tyres

Rubber trees grow best in a climate where there is heavy rainfall and temperatures between 20°C and 35°C. Farmers in Thailand, Indonesia, China and West Africa provide 85% of the world's natural rubber supply. Rubber trees take 6 years to produce their first crop. Consequently, the supply of rubber is price inelastic.

Between 2000 and 2019 the demand for rubber tyres increased resulting in deforestation. 3 million hectares of forests in the Mekong region of South East Asia were lost to make space for rubber plantations.

A research study into car emissions found that tyres emitted 1 000 times more PM2.5 particles than emissions from exhaust fumes. This study was based on testing one fully loaded car and one type of road surface.

Long-term exposure to PM2.5 results in:

- respiratory diseases and reduced lung function in children and adults
- increased risk of lung cancer
- cardiovascular disease affecting the heart and causing strokes.

Further problems are caused when tyres are sent to landfill. Tyres contain chemicals and heavy metals that are released into the environment over time. These cause cancer and genetic mutations.

Tyre recycling has helped to reduce the number of tyres in landfill from one billion in 1991 to 60 million in 2018. In the USA 43% of the recycled tyres are used to produce energy. These recycled tyres produce 25% more energy than coal. The ash from the tyres is less polluting than burning coal.

Extract C Profits of manufacturers of rubber gloves

Rapidly rising demand for rubber gloves across the world enabled the Malaysian rubber glove manufacturer, Top Glove, to achieve a 366% increase in profits in the second quarter of 2020. This was caused by a substantial increase in sales of rubber gloves to the healthcare sector.

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Acknowledgements

Figure 1 based on data taken from https://www.indexmundi.com/commodities/?commodity=rubber&months=12

Extract A adapted from https://www.michelin.com/en/finance/key-figures-and-indicators/markets/

Extract B adapted from https://airqualitynews.com/2020/03/09/air-pollution-from-tyres-1000-worse-than-from-exhaust-claims-study/

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Extract C adapted from 'Malaysia's Top Glove Q3 profit jumps over 360% as sales shoot up during pandemic', Liz Lee, Reuters, June 2011 2020 https://uk.reuters.com/article/top-glove-results/malaysias-top-glove-q3-profit-jumps-over-360-as-sales-shoot-up-during-pandemic-idUKL4N2DO11S