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EDEXCEL INTERNATIONAL A LEVEL ECONOMICS: QUESTIONS BY TOPIC

Supply (1.3.3)

International A Level Economics · Unit 1: Markets in action

25 questions · 128 marks · Mark schemes included
Past papers January 2019 - June 2025 · 2 specification sub-topics

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HOW TO USE THIS BOOKLET

Questions are grouped by specification sub-topic and run from the lowest to the highest mark tariff, then oldest paper first.

Click any row below to jump straight to that sub-topic or question.

On every question page, click ANSWER in the top-right corner to jump to its mark scheme; < QUESTION brings you back.

Whenever a question refers to an extract, figure or table, those exact pages are printed immediately before it ("extracts & data").

A gold bar in the left margin marks exactly where the question sits on the original page.

Diagrams, graphs, tables and data are printed exactly as they appear in the original papers.

QUESTION	SOURCE	MARKS	PAGE
1.3.3.1 THE SUPPLY CURVE		4 Qs · 36 marks	2
1. Q12(a)	IAL Unit 1 June 2023	2	3
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QUESTIONS

25 questions · 128 marks · 2 sub-topics

SUB-TOPIC 1.3.3.1

THE SUPPLY CURVE

Sub-topic 1.3.3.1 · 4 questions · 36 marks · lowest tariff first



SECTION C

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

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

- 12** (a) Define the term 'supply' (Extract A, line 8). (2)
- (b) With reference to Extract A, explain **one** advantage of Apple using energy produced from renewable resources. (4)
- (c) With reference to Figure 1 and Extract B, analyse **two** reasons why the 'world price of lithium increased by 191%' (Extract B, line 2).
Illustrate your answer with a supply and demand diagram. (6)
- (d) With reference to the last paragraph of Extract C, examine **two** likely effects on smartphone manufacturers of the growth in the market for refurbished smartphones. (8)
- (e) With reference to Extract C, discuss the microeconomic effects of the increase in smartphone manufacturing between 2011 and 2021. Refer to external costs in your answer.
Illustrate your answer with an externalities diagram. (14)

Sources for use with Section C

Renewables, lithium and smartphones

Extract A Apple's renewable commitment

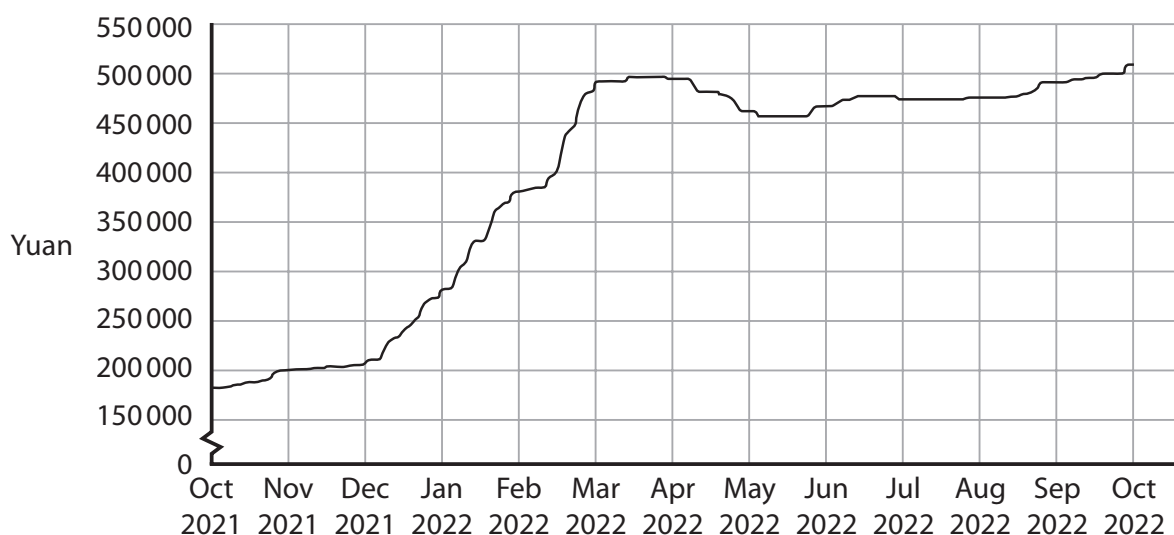
In 2020 100% of the energy used directly by Apple was from renewable resources. In 2022 it announced that 213 of its suppliers had agreed to use only renewable resources to power production. Examples of Apple's commitment to renewable energy include:

- investment in a 2 300 acre solar project in Texas
- a data centre in Denmark powered by a solar park and wind farm
- Apple's supplier, Keiwa, in Japan using renewable energy from a wind farm.

5

The global supply of energy produced from renewable resources is expected to increase by 8% in 2022.

Figure 1 World price of lithium, yuan per tonne, October 2021 to October 2022



Extract B Demand for lithium

Between October 2021 and October 2022 the world price of lithium increased by 191%. Lithium production increased by 20% but demand increased by significantly more.

With rising oil prices many consumers switched from petrol and diesel cars to electric cars. These electric vehicles require lithium in the batteries. In 2021 global sales of electric vehicles increased by 108% to 6.75 million and in China sales grew by 157.5%. Sales of smartphones, that also use lithium batteries, increased by 11.4% in 2021 to 1.5 billion. 5

Extract C Smartphone manufacturing

Between 2011 and 2021 smartphone production increased from 472 million to 1 433 million. Globally 4.5 billion people owned a smartphone by the end of 2022. In 2022 smartphones will produce 146 million tonnes of CO₂ emissions which is 0.5% of global carbon emissions. These emissions are produced in the manufacturing, transportation, usage and recycling of smartphones. 5

Smartphone devices contain several precious and rare earth metals. The environmental costs of mining these metals can be significant. Extracting iron, aluminium and copper produces huge amounts of liquid and solid waste. For example, in 2015 33 billion litres of waste was spilt from an iron ore mine in Minas Gerais, Brazil. In addition, mining gold is a major cause of deforestation. 10

Smartphone manufacturers are producing phones which last longer but are more expensive. As a result consumers do not replace their smartphones so frequently. The market for smartphones that have been refurbished* is forecast to be worth \$65 billion by 2024. Typically, a consumer can sell a one-year-old smartphone for 50% of its original price. The manufacturer can sell the same refurbished smartphone for 80% of its original price. Unwanted smartphones in developed countries are desired in emerging countries. 15

* a refurbished smartphone is one that has been repaired and rebuilt.

1

12 (a) Define the term 'supply' (Extract A, line 8). (2)

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(b) With reference to Extract A, explain **one** advantage of Apple using energy produced from renewable resources. (4)

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SECTION B

Study Figures 1 and 2 and Extracts A and B in the Source Booklet before answering Question 7.

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

- 7** (a) With reference to Figure 1, calculate the percentage change in the average world price of coffee beans from 1 July 2017 to 1 May 2019. You are advised to show your working. (2)
- (b) With reference to Extract A (line 12), explain what is meant by 'short-run shutdown point.' (4)
- (c) With reference to Figure 2 and Extract A, analyse **two** possible reasons for the increase in supply of coffee beans between 2015 and 2019. (6)
- (d) With reference to Extract B, examine **two** barriers to entry into the US coffee shop market. (8)
- (e) With reference to the information provided, discuss the reasons for the increase in Starbucks' profits in 2019.
For **one** of these reasons, illustrate your answer with an appropriate cost and revenue diagram. (14)

Sources for use with Section B.

The global coffee market

Figure 1 Average world price of coffee beans, \$ per kg, July 2017–May 2019

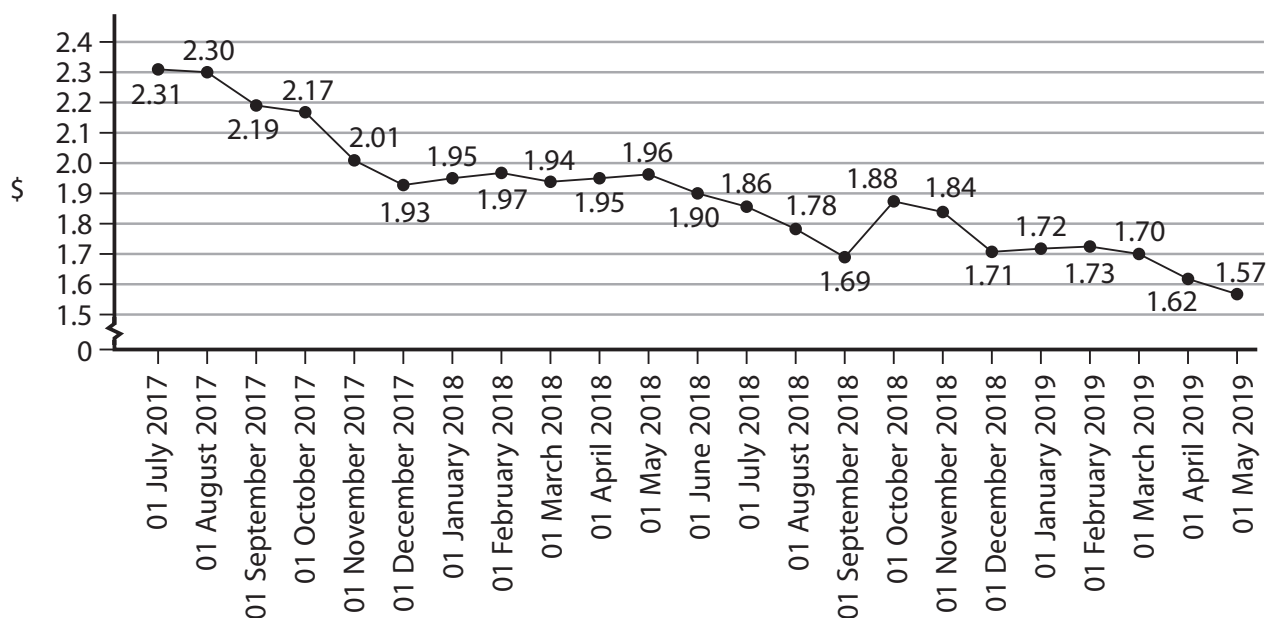
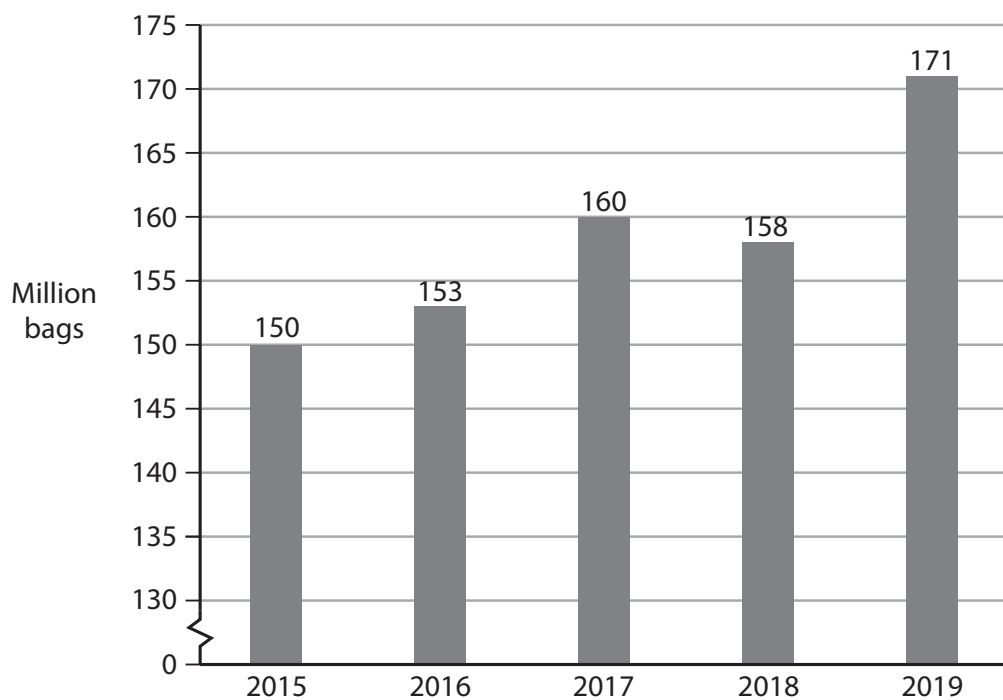


Figure 2 World coffee production, million bags, 2015–2019



Extract A Global coffee bean production

In 2019 the supply of coffee beans was greater than the demand, resulting in a global coffee bean surplus of over 4 million bags. Coffee bean supply increased by 8% whereas demand increased by only 2%. Consequently, by May 2019, the global price of coffee beans fell to its lowest level in over 10 years.

5

The increase in global production was caused by developments in farming equipment and improved methods of production. Also, favourable weather conditions in major coffee-producing countries, such as Brazil, contributed to the global increase in production.

The fall in the global price of coffee beans caused serious problems for small coffee growers in Central America and Africa. These farmers made large losses and many reached their short-run shutdown point. Some farmers have switched to the production of lower-risk crops.

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Extract B Coffee shop chain growth

Coffee is the second most popular drink in the world and the demand for it is increasing steadily. Globally two billion cups of coffee are consumed every day. The revenue of coffee shop chains globally is projected to reach \$237.6 billion by 2025.

Starbucks is the largest coffee shop chain worldwide. In 2019 Starbucks' revenue increased by 7.24%. Its profits also increased by 7.11% to \$17.98 billion. The company had over 27 000 stores worldwide, with many new shops opening in China.

5

In the USA it is difficult for a new firm to enter the coffee shop market because there are already a number of well-known firms. These include Starbucks, Tim Hortons, Dunkin' Donuts, Dutch Bros Coffee and Peet's Coffee. The firms compete using special offers, large advertising budgets and loyalty schemes. More recently, these firms have been using higher quality coffee beans and cold coffee drinks to attract younger coffee drinkers. They have also been investing heavily in developing mobile phone apps and online ordering systems to increase brand loyalty and market shares. Industry leaders believe that social media advertising is the most effective form of marketing for coffee shops.

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However, there are still a large number of successful, small independent coffee shops in the USA. These are often very different to the larger firms, offering alternative drinks and food options. They are also located in out-of-town-centres and aim to attract a different type of consumer.

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(6)



[illegible]

SECTION C

Study Figure 1, Extract A, Figure 2 and Extract B in the Source Booklet before answering Question 12.

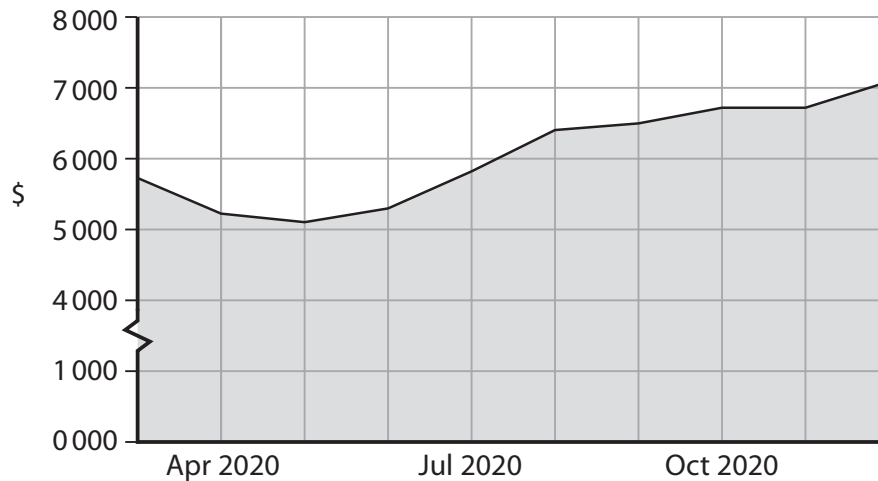
Write your answers in the space provided on the following pages.

- 12** (a) Define the term 'external costs' (Extract B, line 3). (2)
- (b) With reference to Figure 2, explain the difference between 'renewable resources' and 'non renewable resources'. (4)
- (c) With reference to Figure 1 and Extract A, analyse **two** reasons why 'the world price of copper increased significantly' between May and December 2020. (6)
- Illustrate your answer with a supply and demand diagram.
- (d) With reference to Extract A, examine **two** likely effects of an increase in the price of copper on plumbing firms that replace water pipes in customers' homes. (8)
- (e) With reference to Extract B and your own knowledge, discuss the possible effects of a subsidy paid to manufacturers of battery electric buses (BEBs). (14)
- Illustrate your answer with an appropriate diagram.

Sources for use with Section C

The markets for copper, electricity and battery electric buses (BEBs)

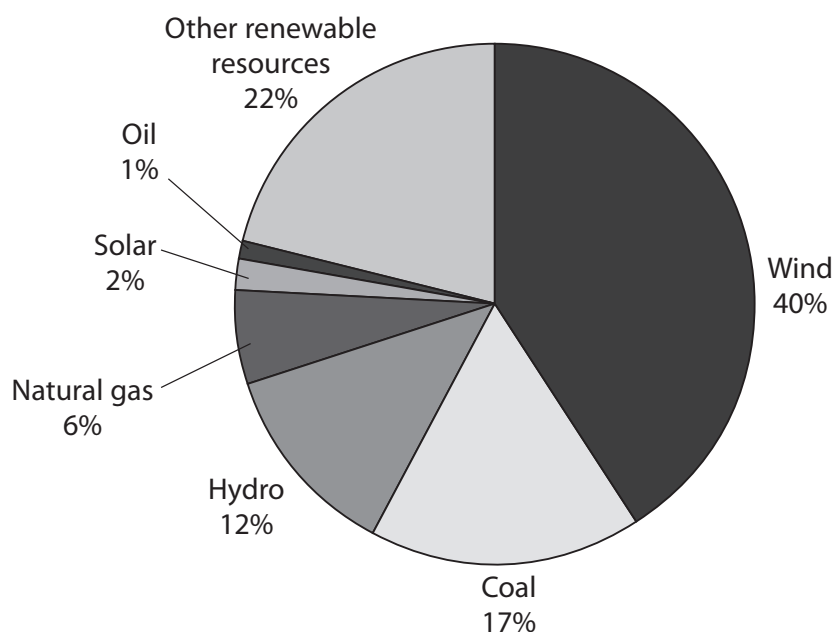
Figure 1 World price of copper, \$ per metric tonne, March 2020 to December 2020



Extract A Copper prices rise

Between May and December 2020 the world price of copper increased significantly. Speculators expected the global rate of economic growth to recover from the global health crisis and started to buy more copper. In addition, the Chinese Government made a substantial investment in infrastructure that required copper. Output of electric vehicles also increased. Each vehicle requires approximately 59 kg of copper in its production. 5

Most plumbers prefer to use copper pipes rather than plastic pipes. With the increased demand for copper for other purposes, it is likely that the price of copper pipes will increase significantly in the future.

Figure 2 Electricity generation by different sources in Denmark, 2018**Extract B Battery electric buses (BEBs)**

Diesel buses are used in city locations with large concentrations of people. They create external costs, including reducing air quality. Children who ride the bus to school are more likely to develop respiratory diseases, such as asthma, and to have higher rates of cancer.

5

BEBs are powered by electric batteries that run an electric motor. Bus batteries are recharged using the national electricity grid. BEBs do not have engines that use fossil fuels. Therefore, BEBs help to reduce greenhouse gas emissions and pollution in city centres. They also produce much less noise pollution than diesel buses.

In 2018 the price of a diesel bus was \$480 000, whereas the price of a BEB was \$887 000. This price difference has started to decrease. For a transport company, it is 2.5 times cheaper to run a BEB than a diesel bus. The maintenance costs are also far lower for a BEB as there are fewer component parts within the motor. On average, a BEB can travel 150 miles on a fully charged battery, whereas a diesel bus can travel 690 miles on a full tank of diesel.

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In 2018 there were 386 000 BEBs globally. 99% of these were in China and 0.09% were in the USA. In response, the US Government allocated \$979 million of subsidies to increase the number of BEBs.

(8)





SECTION D

Answer ONE question from this section.

Write your answer in the space provided.

EITHER

13 In January 2022 average energy prices increased by 28.6% in the eurozone area. In response:

- the German Government provided subsidies to energy producers
- the Spanish Government reduced indirect taxes on energy bills
- the French Government introduced a maximum price on energy bills.

Evaluate **two** possible measures that could be introduced to reduce the price that consumers pay for energy.

Include at least one diagram in your answer.

(Total for Question 13 = 20 marks)

OR

14 Fertiliser is used by farmers to increase the output of crops per acre of farmland. In 2021 farmers experienced a 400% increase in the cost of fertiliser. Between March 2021 and March 2022 the global food price index increased by 38%.

Evaluate the impact of the 400% increase in the cost of fertiliser on farmers and households.

Include one diagram to show the impact on farmers in your answer.

(Total for Question 14 = 20 marks)



SUB-TOPIC 1.3.3.2

PRICE ELASTICITY OF SUPPLY

Sub-topic 1.3.3.2 · 21 questions · 92 marks · lowest tariff first



6 The table shows the estimated price elasticity of supply for three commodities.

Commodities	Estimates of price elasticity of supply
Corn	+0.23
Rice	+0.27
Wheat	+0.31

(Source: <http://ageconsearch.umn.edu/bitstream/19267/1/sp05zh01.pdf>)

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

- ☐ A Corn, rice and wheat have price elastic supply
- ☐ B A 10% increase in the price of corn will cause a 23% increase in quantity supplied
- ☐ C A 10% increase in the price of rice will cause a 2.7% decrease in quantity supplied
- ☐ D A 10% increase in the price of wheat will cause a 3.1% increase in quantity supplied

(Total for Question 6 = 1 mark)

TOTAL FOR SECTION A = 6 MARKS



- 5 The table shows the estimated price elasticity of supply for cotton in selected countries.

Australia	0.46
Egypt	0.16
India	0.31
Mexico	1.08

(Source: <http://www.fao.org/3/a-ah470e.pdf>)

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

- ☐ A Supply is price elastic in India
- ☐ B Supply is price inelastic in Mexico
- ☐ C Supply is least responsive to a change in price in Egypt
- ☐ D Supply is most responsive to a change in price in Australia

(Total for Question 5 = 1 mark)

- 6 In 2017 the average price of a smartphone increased by 5% in Western Europe. This resulted in a 4% decrease in the sales of smartphones in this region.

Ceteris paribus, the price elasticity of demand for smartphones in this region is equal to

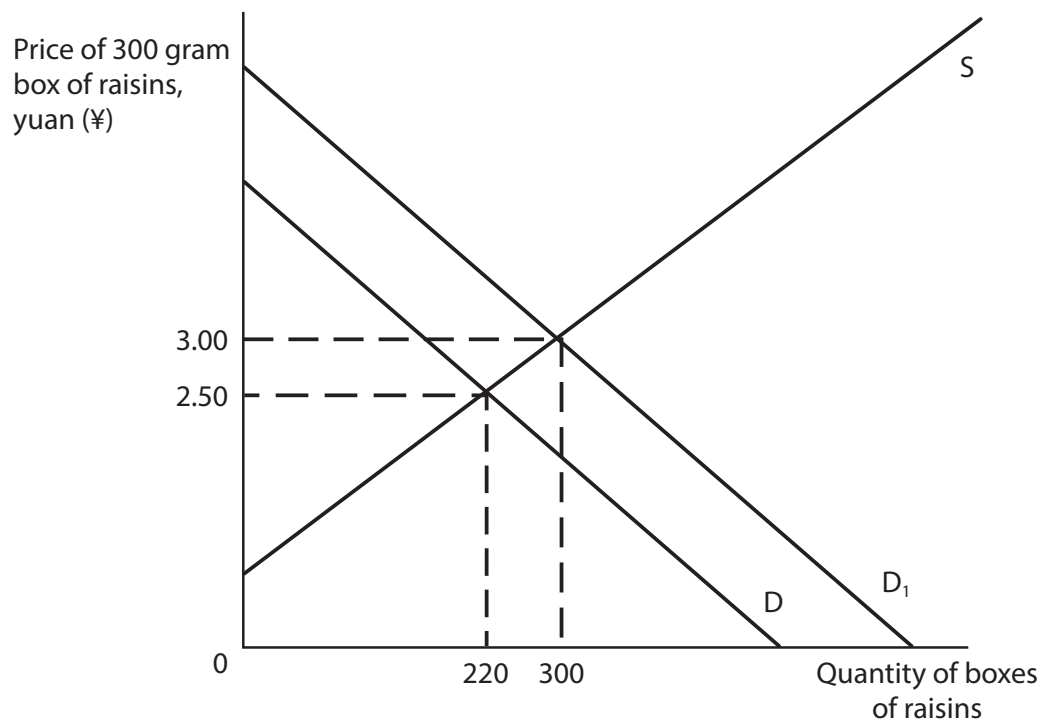
- ☐ A -1.25
- ☐ B -0.80
- ☐ C +0.80
- ☐ D +1.25

(Total for Question 6 = 1 mark)

TOTAL FOR SECTION A = 6 MARKS



4 The diagram shows the market for 300 gram boxes of raisins in China.



Which **one** of the following is the price elasticity of supply for boxes of raisins when the demand curve shifts from D to D₁?

- ☐ A -1.82
- ☐ B -0.55
- ☐ C +0.55
- ☐ D +1.82

(Total for Question 4 = 1 mark)

- 5 The table shows the proportion of electricity generated from different sources for Denmark in 2010 and 2021.

	Coal	Oil	Natural gas	Hydro	Wind	Solar	Other renewables
2010	43.8%	2.0%	20.3%	0.1%	20.1%	0.0%	13.7%
2021	13.2%	0.8%	4.6%	0.0%	48.6%	4.0%	28.8%

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

- ☐ A Most electricity was generated by renewable resources in 2010 and by non-renewable resources in 2021
- ☐ B Most electricity was generated by non-renewable resources in 2010 and by renewable resources in 2021
- ☐ C In 2010 66.1% of electricity was generated using renewable resources
- ☐ D In 2021 81.4% of electricity was generated using non-renewable resources

(Total for Question 5 = 1 mark)

- 6 In 2022 average house prices in China decreased by 2.1%. Research into the housing market in China estimated that the price elasticity of supply for new houses was 2.8.

Ceteris paribus, which **one** of the following can be deduced from this information?

- ☐ A The supply of new houses would decrease by 5.88%
- ☐ B The supply of new houses would increase by 5.88%
- ☐ C The supply of new houses would increase by 1.33%
- ☐ D The supply of new houses would decrease by 1.33%

(Total for Question 6 = 1 mark)

TOTAL FOR SECTION A = 6 MARKS



SECTION C

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

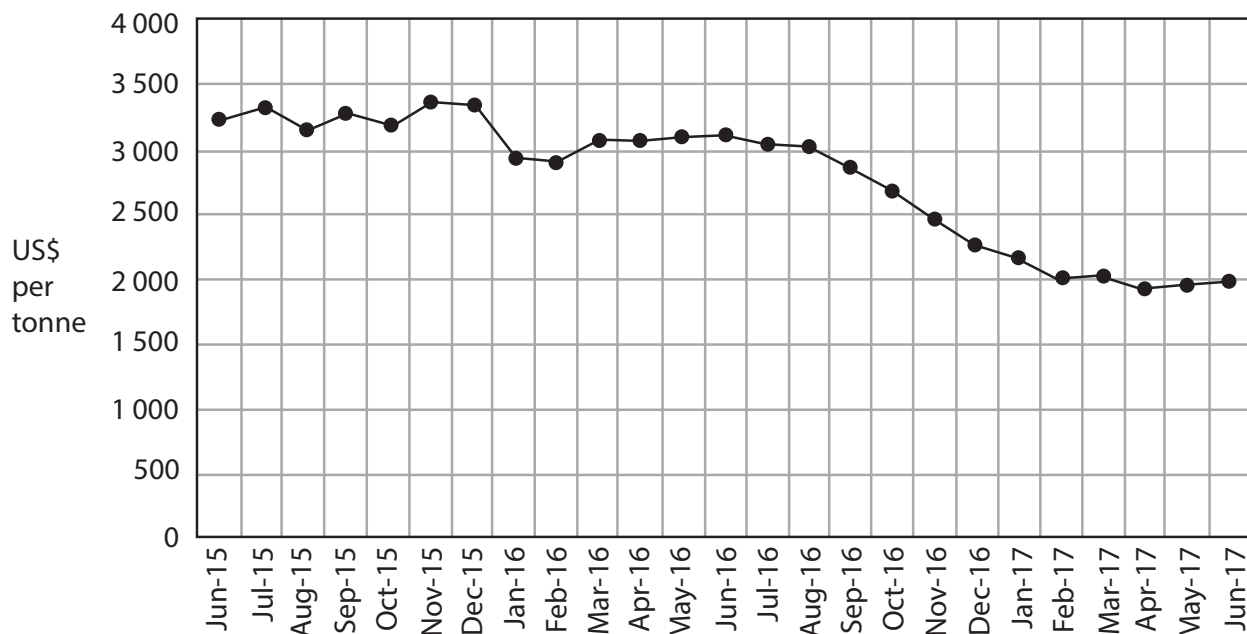
Write your answers in the space provided on the following pages.

- 12** (a) Define the term 'substitutes' (Extract A, line 12). (2)
- (b) With reference to Extract A, explain **one** factor that is likely to influence the price elasticity of supply for cocoa beans. (4)
- (c) With reference to Figure 1 and Extract A, analyse **one** reason why the price of cocoa beans 'fell below \$2 000 per tonne' (Extract A, line 8) in April 2017. Illustrate your answer with a supply and demand diagram. (6)
- (d) With reference to Extract B, examine the external costs associated with the production of cocoa beans. (8)
- (e) With reference to Extract C, discuss the likely effects of the reduction in the minimum (guaranteed) price for cocoa. Illustrate your answer with an appropriate diagram. (14)

Sources for use with Section C.

The market for cocoa

Figure 1 - Price of cocoa beans, US\$ per tonne, June 2015 to June 2017



Extract A - The price of cocoa falls

Cocoa bean prices were high during 2015 and much of 2016 reflecting increased demand and decreased supply. For example, in 2016, consumption of cocoa exceeded production by 197 000 tonnes.

However, in 2017, production in the Côte d'Ivoire rose from 1.45 million tonnes to 1.93 million tonnes. The Côte d'Ivoire's output increased after many new cocoa trees matured. Good cocoa harvests during 2017 led to stocks being 27.3% higher than in 2016. In April 2017, cocoa bean prices fell below \$2 000 per tonne.

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Cocoa trees take four to five years to mature and produce cocoa pods. Cocoa trees grow best in regions near the equator. This means very few countries can successfully grow the crop.

10

In contrast, the prices of substitutes for cocoa such as tea and coffee increased during 2017.

Extract B – Cocoa production can damage the environment

Poor management of land used to produce cocoa means rainforest has to be destroyed so new plantations can be started. Soil erosion, caused by growing too much cocoa, makes the land less fertile and reduces crop yield. To increase production, some farmers have started to use fertilisers which cause river pollution.

5

Farmers should be removing old cocoa trees and allowing the land to recover. Many cannot afford to do this because they need to earn revenue until the replacement trees grow. The continued use of older trees results in lower yields. Consequently farmers seek new land by destroying rainforests. In Indonesia the amount of land that is rainforest has fallen from 30% to closer to 15%. This has a significant negative impact on biodiversity.

10

However, the Rainforest Alliance trains cocoa farmers on how to manage their trees to avoid environmental damage. Between 2009 to 2015 the amount of cocoa produced by Rainforest Alliance farms increased from 2% to 16%.

Extract C – Minimum price scheme in the Côte d'Ivoire

The Côte d'Ivoire Government sets a minimum (guaranteed) price for cocoa. In 2017, it reduced the minimum price by 36% to cut government spending and reduce cocoa stocks. However, some farmers still sell cocoa at prices below the minimum price because they can receive payments more quickly than from the Government.

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12 (a) Define the term 'substitutes' (Extract A, line 12).

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(b) With reference to Extract A, explain **one** factor that is likely to influence the price elasticity of supply for cocoa beans.

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SECTION C

Study Figures 1 and 2 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 'substitutes' (Extract A, line 8). (2)
- (b) Explain what is meant by the term 'inelastic supply'. Refer to Figure 1 and Extract A in your answer. (4)
- (c) Analyse why the price of vanilla increased significantly between 2014 and 2018. Refer to Figure 2 and Extract A in your answer. (6)
- Illustrate your answer with a supply and demand diagram. (6)
- (d) With reference to Extract C, examine two microeconomic effects of Finland's decision to remove the sugar tax. (8)
- (e) Discuss reasons why the 'quantity of education is below the social optimum level' (Extract B, lines 2 and 3). Refer to external benefits in your answer. (14)
- Illustrate your answer with an appropriate diagram. (14)

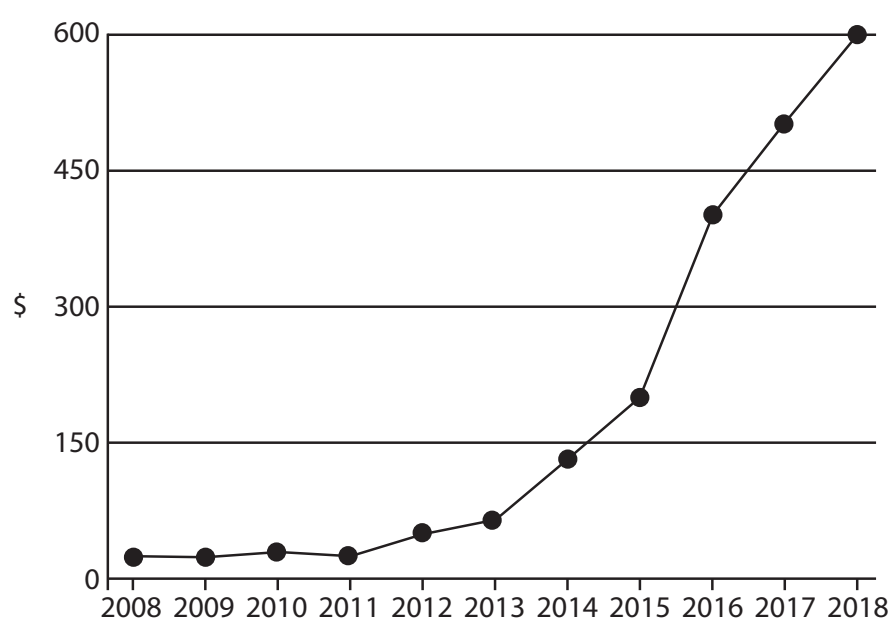
Sources for use with Section C.

The markets for vanilla, education and sugar

Figure 1 Estimated price elasticity of supply for vanilla in Madagascar and Indonesia

	Madagascar	Indonesia
Price elasticity of supply	0.48	0.52

Figure 2 US\$ price of vanilla per kilogram, 2008-2018



Extract A Vanilla price increases

Madagascar grows 80% of the world's vanilla. Few other countries have the climate to be able to grow the crop. Between 2008 and 2011 the price was so low that some vanilla growers stopped production and grew other crops instead. However, the price of vanilla increased significantly between 2014 and 2018.

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In 2017 a cyclone in Madagascar destroyed a large quantity of the vanilla crop. As a result some farmers will not see their vanilla crops recover fully until 2020.

There are artificial substitutes for vanilla such as vanillin. However, in recent years, consumers have shown an increased preference for natural vanilla. Vanilla is a key ingredient used in ice cream, sweets, chocolate and in cosmetic products. The demand for all of these products has increased rapidly in recent years.

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The high price attracted farmers in other countries, such as Uganda, to start growing vanilla. However, it takes three years for the plantations to mature and produce vanilla crops.

Extract B Lack of education in Madagascar

Adults in Madagascar have typically spent only 4.4 years at school. This quantity of education is below the social optimum level.

In 2012 it was estimated that 20 000 children aged 12 to 17 years old worked in the production of vanilla. This was 32% of the workforce employed in this industry. Many families need their children to work to earn an additional income. They cannot afford to lose this income by sending their children to school. Following the cyclone the price of food in Madagascar rose significantly. This increased the need for children to work.

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Many primary schools are in a poor condition and are overcrowded. Teachers have limited or no training. Many schools are destroyed by the annual cyclones and public funds for education have been reduced.

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Extract C Sugar tax removed in Finland

In 2011 the Government of Finland introduced an indirect tax known as a sugar tax on sweets, chocolate, ice cream and fizzy drinks. This was charged at €0.95 per kilogram or €0.11 per litre. The tax raised revenue for the government and decreased consumption of these products by approximately 5%.

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In 2017 Finland removed the sugar tax. It had been criticised as being unfair. Manufacturers of biscuits and cakes had been unaffected by the tax giving them a competitive advantage over sweet and chocolate manufacturers. The tax revenue that would have been raised was estimated to be €109 million per year.

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

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(b) Explain what is meant by the term 'inelastic supply'. Refer to Figure 1 and Extract A in your answer.

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SECTION C

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

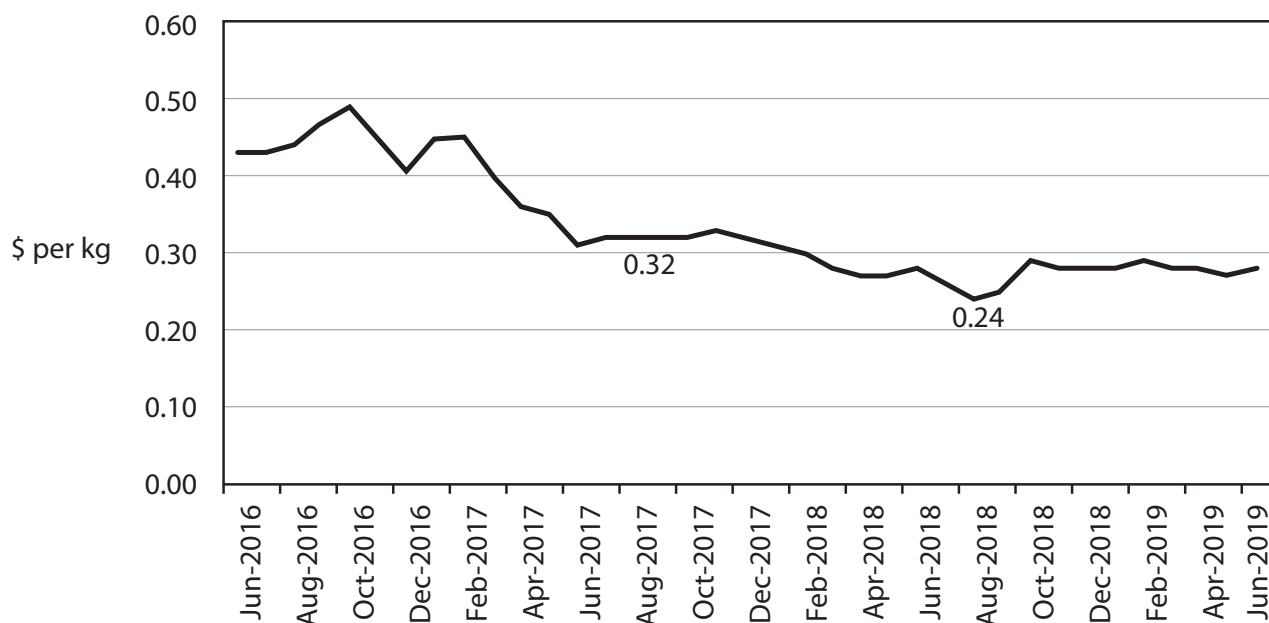
Write your answers in the space provided on the following pages.

- 12** (a) Define the term 'substitutes' (Extract A, line 9). (2)
- (b) With reference to Extract A, explain **one** factor that is likely to influence the price elasticity of supply for sugar. (4)
- (c) With reference to Figure 1 and Extract A, analyse **two** reasons why the world price of sugar fell between August 2017 and August 2018. (6)
- Illustrate your answer with a supply and demand diagram.
- (d) With reference to Extract B, examine **two** possible effects of information gaps on the consumption of sugar. (8)
- (e) With reference to Extract C, discuss the likely effects of the increase in the subsidy for sugar production. (14)
- Illustrate your answer with an appropriate diagram.

Sources for use with Section C.

The market for sugar

Figure 1 World price of sugar, US\$ per kg, June 2016 – June 2019



Extract A Global production of sugar

Between August 2017 and August 2018 the world price of sugar fell as a result of favourable weather leading to good harvests. In 2018, India, the world's second largest sugar producer and Thailand, the world's fourth largest sugar producer, had record levels of production. In 2018 global production was 11% higher than in 2017. In 2018 world production was so high that there was a surplus of 17 million tonnes. This led to large quantities of sugar being held in storage.

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In recent years, consumption of sugar has fallen because of increasing health concerns. There is also competition from substitutes such as artificial sweeteners. In the USA, Europe, China and Australia sugar consumption has fallen or remained unchanged.

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Sugar is grown in 119 countries. It takes sugar cane one year to mature in countries with warm temperatures and two years in cooler countries.



Extract B Overconsumption of sugar

In the USA the recommended maximum amount of sugar consumption is 50 grams per day. In the USA average consumption is 73 grams per day. The human body can comfortably process 25 grams a day. However, any sugar consumption in excess of 25 grams per day will normally be processed into body fat. This is contributing to obesity. 5

One study found that a high sugar diet increased the risk of heart disease by 38%. Another study found that excess sugar consumption caused an increased risk of many types of cancer. A further study found that men who consumed 67 grams or more of sugar per day were 23% more likely to experience depression than men who consumed less than 40 grams per day. 10

Extract C Indian subsidy for sugar production

The Indian Government subsidises sugar growers that export sugar. Before the subsidy, exports were 620 000 tonnes per year. After the subsidy was introduced exports rose to 3.3 million tonnes per year, helping to make India the world's second largest producer of sugar. The size of the subsidy will increase from 55 rupees a tonne in 2018 to 138 rupees a tonne in 2019. This increase in subsidy is expected to increase exports to over seven million tonnes per year. Production in India was 20.3 million tonnes in 2017 and increased to 33.0 million tonnes in 2019. 5

The Governments' of Brazil and Australia have complained to the World Trade Organization that these subsidies give Indian producers an unfair advantage. They argue that these subsidies contribute to lower world prices, making the market unprofitable for many growers outside India. 10

12 (a) Define the term 'substitutes' (Extract A, line 9).

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(b) With reference to Extract A, explain **one** factor that is likely to influence the price elasticity of supply for sugar.

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SECTION C

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

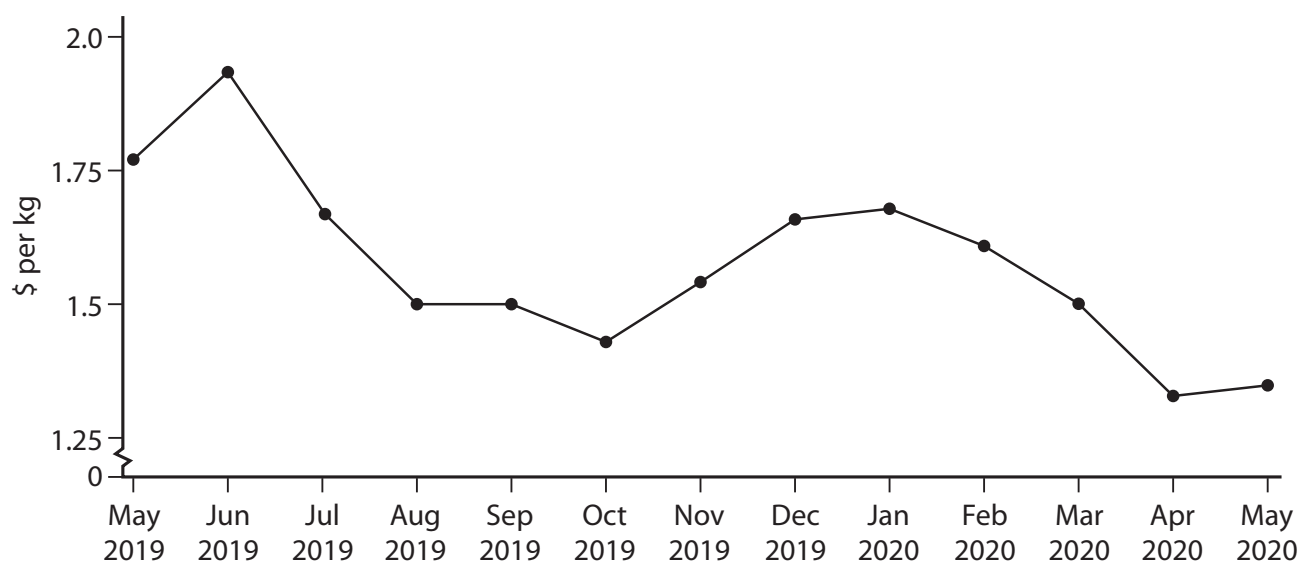
Write your answers in the space provided on the following pages.

- 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)

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.

5



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.

5

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.

10

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.

15

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.

20

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

(4)



SECTION C

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

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

- 12** (a) Define the term 'external costs' (Extract C, line 11). (2)
- (b) With reference to the second paragraph of Extract A, explain the phrase 'the supply of semiconductors is inelastic.' (4)
- (c) With reference to Extract A, analyse **two** reasons why semiconductor prices 'increased on average by 20%'.
Illustrate your answer with a supply and demand diagram. (6)
- (d) With reference to Extract B and Figure 1, examine **two** likely effects of excess demand for semiconductors on car manufacturers. (8)
- (e) With reference to Extract C and your own knowledge, discuss the possible microeconomic effects of the subsidies paid to semiconductor manufacturers in the USA.
Illustrate your answer with an appropriate diagram. (14)

Sources for use with Section C

The semiconductor market

Extract A Semiconductor shortage

Semiconductors are used in a wide range of goods including cars, washing machines and smartphones. In Quarter 1 2021 the price of semiconductors increased on average by 20%. This was partly caused by a rise in the costs of steel and copper that are used in the production of semiconductors. A further cause was the global health crisis that led to a significant increase in the demand for laptops, tablets and smartphones. Semiconductors are essential components of these devices. 5

The supply of semiconductors is inelastic. Manufacturers of semiconductors were operating at 100% capacity and therefore struggled to respond to the increase in demand. Semiconductor manufacturers tried to increase production but it was not possible to make additional capacity available for a considerable time. 10

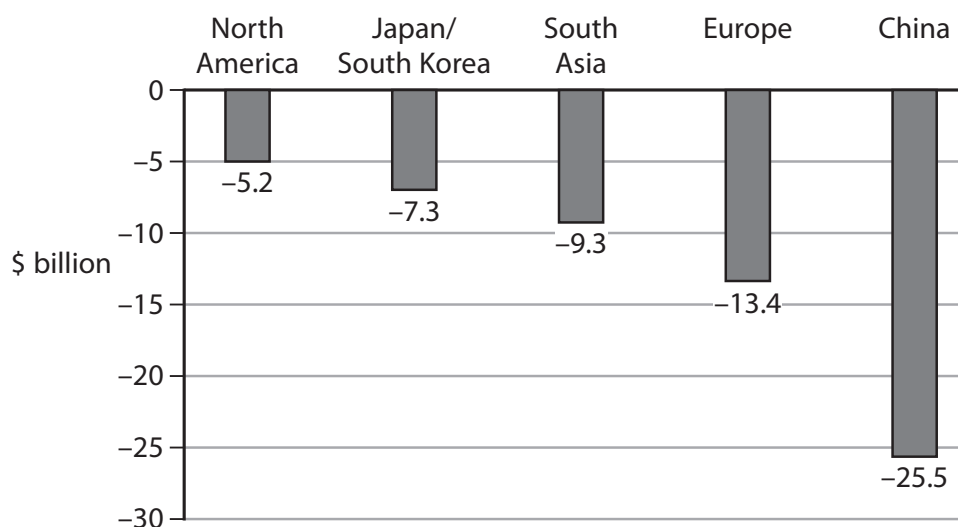
Extract B Excess demand for semiconductors affects car manufacturers

In 2021 the global demand for cars increased following very low sales in 2020. This increased the demand for semiconductors. However, the manufacturers of semiconductors were unable to supply the amount demanded, resulting in excess demand. As a result, many car manufacturers reduced production. For example: 5

- Volkswagen produced 100 000 fewer cars in the first quarter of 2021
- Car production in Japan decreased by 19% in May 2021
- General Motors (GM) shut down production in July and August 2021.

Some car manufacturers removed features that require semiconductors. For example, GM removed wireless charging features, Renault stopped installing large screens and Nissan removed navigation systems. 10

The shortage of new cars led to higher prices and many consumers had to buy used cars whose prices increased also. In the USA the average price of used cars doubled in the first 6 months of 2021.

Figure 1 Fall in the revenues of car manufacturers in 2021, \$ billion, by region**Extract C Subsidies to semiconductor manufacturers in the USA**

In 1990 63% of semiconductors required by manufacturers in the USA were imported. By 2020 this had increased to 88%. Between 2000 and 2020 the US Government made no subsidy payments to semiconductor manufacturers. However, in 2021 it provided subsidies of \$52 billion. The US Government wanted to reduce its reliance on importing semiconductors. The subsidies may make it more profitable to produce semiconductors in the USA rather than in Asia, where production costs are lower. It is hoped that the subsidies will result in at least seven new semiconductor factories being built in the USA. However, it typically takes three years before a semiconductor factory is fully operational.

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There are concerns that increased production of semiconductors will cause a range of external costs. Production involves acids and toxic gases that may cause cancer. A large amount of water is required to manufacture semiconductors and this creates contaminated waste water.

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12 (a) Define the term 'external costs' (Extract C, line 11).

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(b) With reference to the second paragraph of Extract A, explain the phrase 'the supply of semiconductors is inelastic.'

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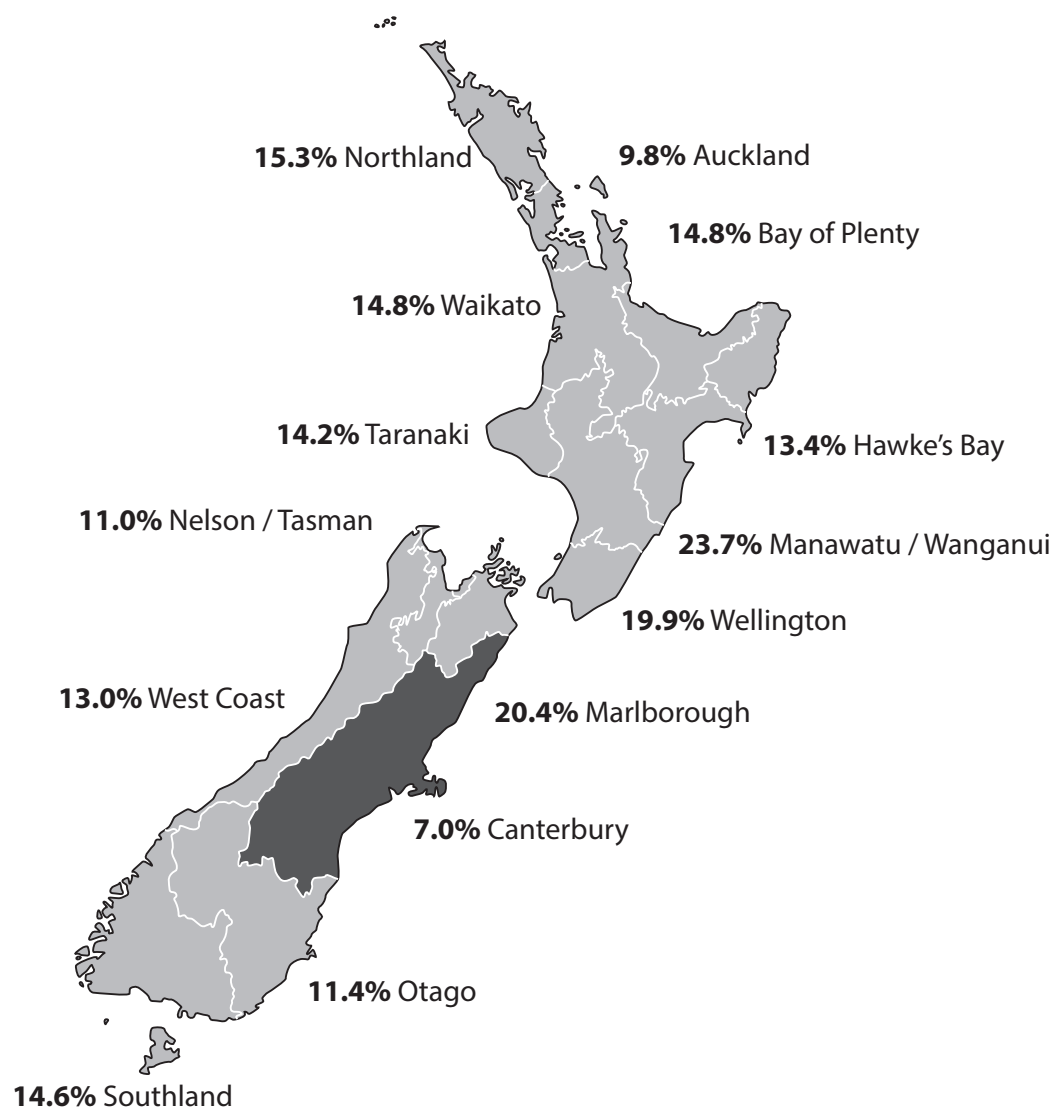


SECTION C

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 'market failure' (Extract A, line 14). (2)
- (b) With reference to paragraph 1 of Extract A, analyse **two** reasons why house prices increased between March 2020 and March 2021. (6)
- Illustrate your answer with a supply and demand diagram. (4)
- (c) With reference to Extract B, explain why the supply of new houses is likely to be price inelastic. (8)
- (d) With reference to Extract C, examine whether national parks in New Zealand are public goods. (14)
- (e) With reference to Figure 1, Extract A and Extract B, discuss the likely microeconomic effects of a housing market bubble in New Zealand. (14)

Sources for use with Section C**New Zealand's housing market and national parks****Figure 1 Percentage change in house prices between March 2020 and March 2021, by region**

Extract A Rapid increase in house prices

House prices in New Zealand increased by 15.7% between March 2020 and March 2021. The average house price had risen to NZ\$925 000. This increase in house prices was caused by increasing real incomes, low interest rates and a rise in immigration following the global health crisis. Real incomes increased as a result of an above average rate of economic growth. Between March 2020 and March 2021 the base interest rate in New Zealand was just 0.25%, making it relatively cheap to borrow to purchase houses. 5

Research showed that house prices in New Zealand were about 40% overvalued relative to income. House prices were rising faster than real incomes and were 8.6 times median income in 2020 and 10 times median income in 2021. In Auckland, the average property price increased to NZ\$1.4 million in 2021. This was 35 times median income. 10

According to New Zealand's Prime Minister, Jacinda Ardern, many buyers are speculators. In 2020 approximately 15 000 people buying houses owned five or more. She is worried that the speculators could cause a dangerous housing bubble and market failure. She is also concerned that 1% of the population are homeless, the highest rate of homelessness amongst developed countries. 15

Between 2000 and 2021 house prices increased by 256% in New Zealand. By comparison, house prices in the USA increased by 68% and in the UK by 110%.

Extract B House building in New Zealand

In 2017 the Government promised to build 100 000 new homes. Between June 2018 and July 2020 the Government built just 6 000 homes. It is expensive to build houses and there is much paperwork needed to obtain planning permission. Many local authorities limit the land on which houses can be built in order to protect the environment. There is a shortage of over 55 000 construction workers. 5

Between 2011 and 2020 the average annual growth rate in housebuilding was 13%. However, in 2021, the significant increase in house prices created an incentive to build new houses. Consequently, the number of new houses under construction increased by 26%. 10

Extract C New Zealand's national parks

New Zealand has 13 national parks covering 30 000 km² that the public can explore on foot, by boat, car or air. For much of the year there is so much space that an individual will rarely meet another person. However, in the summer season the national parks are very popular. This means that the national parks become more crowded and car parking spaces are hard to find. 5

Some activities within the national parks, such as skiing and kayaking, have to be paid for. However, individuals can walk, run or cycle across the national parks without charge.

(c) With reference to Extract B, explain why the supply of new houses is likely to be price inelastic.

(4)



SECTION C

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

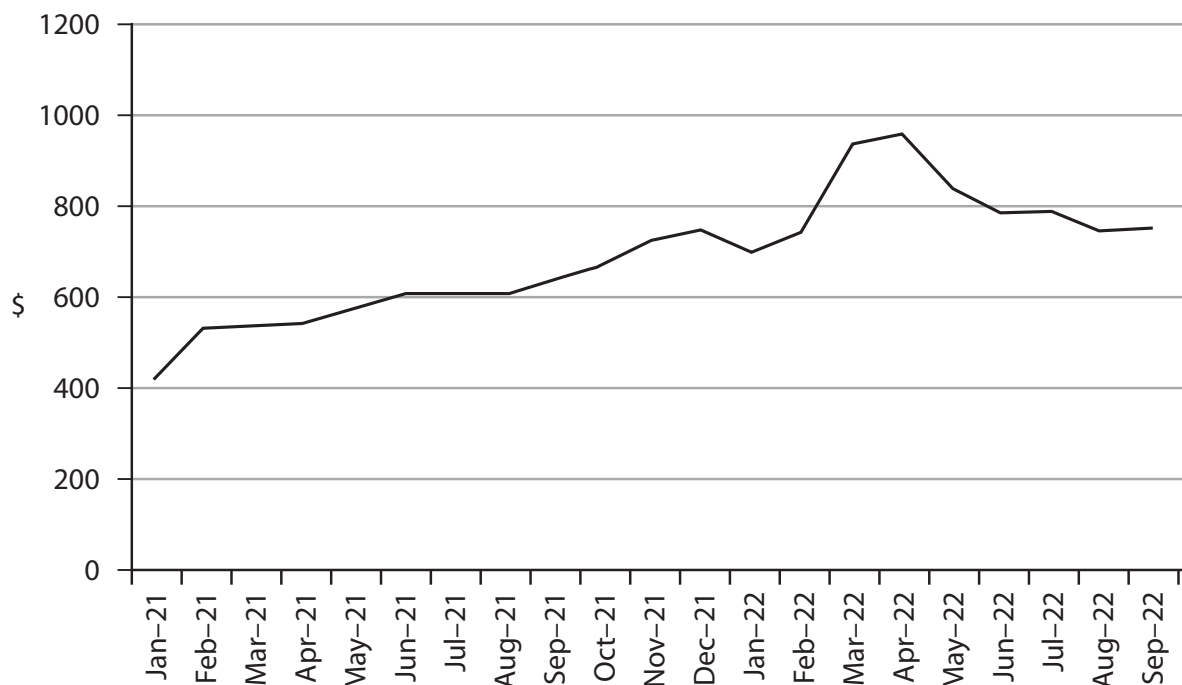
Write your answers in the space provided on the following pages.

- 12** (a) Define the term 'tradeable pollution permit scheme'. (Extract B, line 16) (2)
- (b) With reference to Extract B, explain whether the supply of phosphate rock is likely to be price elastic or price inelastic. (4)
- (c) With reference to Figure 1 and Extract A, analyse **one** demand factor *and* **one** supply factor that caused the price of fertiliser to increase between January 2021 and April 2022. (6)
- Illustrate your answer with a supply and demand diagram.
- (d) With reference to Extract C, examine **two** likely effects of the subsidies paid by Canada's Government to farmers who use more organic farming methods. (8)
- (e) With reference to Extract B, discuss the external costs associated with the production and the use of fertiliser. (14)
- Illustrate your answer with an appropriate diagram.

Sources for use with Section C

The market for fertiliser

Figure 1 World price of fertiliser, \$ per tonne, January 2021 to September 2022



Extract A Demand and supply

Higher crop prices in 2021 provided an incentive for farmers to increase the quantity of crops that they grew. As a result, the demand for fertiliser increased by 6.3% compared with 2020.

Another reason for the increase in demand for fertiliser was that governments paid subsidies to farmers during the global health crisis. These subsidies encouraged farmers to grow more crops.

5

Poor weather caused some factories that manufacture fertiliser to shut down for several weeks. For example, winter storms and Hurricane Ida disrupted production in the USA. Costs of production also rose as a result of a significant increase in the world price of gas.

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Extract B Fertiliser production and its use

Between 1960 and 2019 there was a ten-fold increase in the use of fertiliser by farmers to increase agricultural output. Over the same period crop production increased four-fold. Fertiliser is produced by applying acids to phosphate rock. Phosphate rock is a finite resource and the amount available is decreasing. 5
In addition, the production of fertiliser requires the substantial use of non-renewable resources such as gas and coal. This results in greenhouse gas emissions. Consequently, fertiliser production is responsible for 1% of total global energy use and 1.4% of total carbon emissions.

The fertilisers that are used on farmland are often washed into rivers and lakes. 10
This causes algae to develop and oxygen levels to decrease, resulting in a decline in fish stocks.

85% of the world's supply of phosphate rock comes from just five countries. Morocco produces 70% of total production.

France and Germany are the largest fertiliser manufacturers in the European Union. 15
The European Union's tradeable pollution permit scheme applies to fertiliser manufacturers in these countries.

Extract C Subsidies in Canada

Since 1990 the production and use of fertilisers have accounted for approximately 10% of Canada's greenhouse gas emissions. To reach its 2030 greenhouse gas emissions target, Canada needs to reduce its use of fertiliser. Canada's Government is providing subsidies of CA\$ 750 million to farmers over 10 years to use more organic 5
farming methods to achieve this target.

12 (a) Define the term ‘tradeable pollution permit scheme’. (Extract B, line 16)

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(b) With reference to Extract B, explain whether the supply of phosphate rock is likely to be price elastic or price inelastic.

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- 10** The table shows the global volume of olive oil produced in tonnes and the global price of olive oil per tonne in 2021 and 2022.

Year	Volume of olive oil produced in tonnes	Price of olive oil, per tonne
2021	2.93m	\$4 125
2022	3.27m	\$5 145

Ceteris paribus, calculate the price elasticity of supply for olive oil. Show your workings.

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(Total for Question 10 = 4 marks)



SECTION C

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

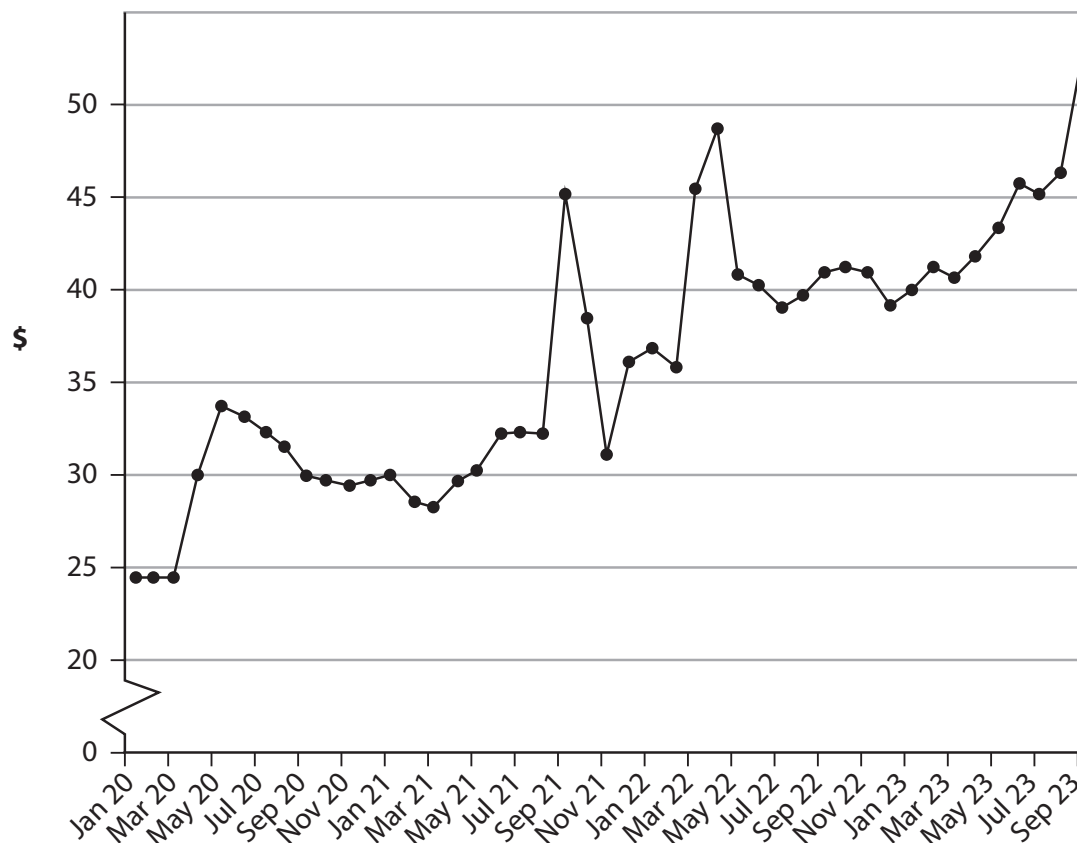
Write your answers in the space provided on the following pages.

- 12** (a) Define the term 'speculation'. (Extract A, line 7) (2)
- (b) With reference to Figure 1 and Extract A, analyse **one** demand factor and **one** supply factor that caused the price of uranium to more than double between January 2020 and September 2023. (6)
- Illustrate your answer with a supply and demand diagram.
- (c) With reference to Extract B, explain whether the supply of nuclear reactors is price elastic or price inelastic. (4)
- (d) With reference to Extract C, examine **two** microeconomic effects of the introduction of an indirect tax on the production of coal. (8)
- (e) With reference to Extract B, discuss the likely effects of subsidies paid to the nuclear power industry on consumers **and** governments. (14)
- Illustrate your answer with an appropriate diagram.

Sources for use with Section C.

Sources of energy generation

Figure 1: World price of uranium, dollars per pound (lb), January 2020 to September 2023



Extract A Price of uranium

Between January 2020 and September 2023 the price of uranium more than doubled.

Uranium is used to generate nuclear power. Many countries have been increasing nuclear power generation for two significant reasons:

- in response to the unstable supply of gas and the rise in its price
- the need to meet international agreements on reducing carbon emissions.

5

This increase in nuclear power generation led to speculation in the market for uranium. Speculators bought significant amounts of uranium accounting for 25% of annual demand.

Over the same period, the production of uranium was affected by various factors:

10

- In France production was disrupted by a lack of critical chemicals
- Kazakhstan, the world's largest supplier, had problems with shipping its uranium out of the country
- Canada had problems at two mines that reduced its production by 9%.



Extract B Nuclear reactors

In August 2023 there were 441 nuclear power reactors operating in 33 countries. They jointly generated 10% of the world's electricity. By 2050 nuclear capacity is expected to increase by 43%, when an additional 60 nuclear reactors will have become active. The replacement of coal and gas-fired power stations with nuclear power will contribute to a 13% reduction in carbon emissions by 2050. It took, on average, 7.5 years to construct each of the 441 nuclear reactors. However, one reactor in Argentina took 33 years to construct.

5

Many governments are subsidising the nuclear power industry. For example:

- In 2021 the UK Government provided subsidies of £1.7 billion
- In 2023 the Government of China provided \$17 billion in subsidies for the building of six new reactors
- The Government of South Korea will spend \$515 million subsidising the nuclear industry.

10

Extract C Coal tax in Indonesia

The Government of Indonesia plans to introduce an indirect tax on the production of coal. In 2018 coal accounted for 40% of the energy generated in the country and caused 95 155 premature deaths. By taxing coal, the Government can use the revenue to compensate those who are negatively affected. It will also create an incentive for electricity generators to switch from coal to renewable sources of energy. This tax is expected to raise \$3.6 billion per year. In 2019 there were 1.96 million people employed in coal mining and coal exports earned \$19 billion per year.

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(c) With reference to Extract B, explain whether the supply of nuclear reactors is price elastic or price inelastic.

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SECTION C

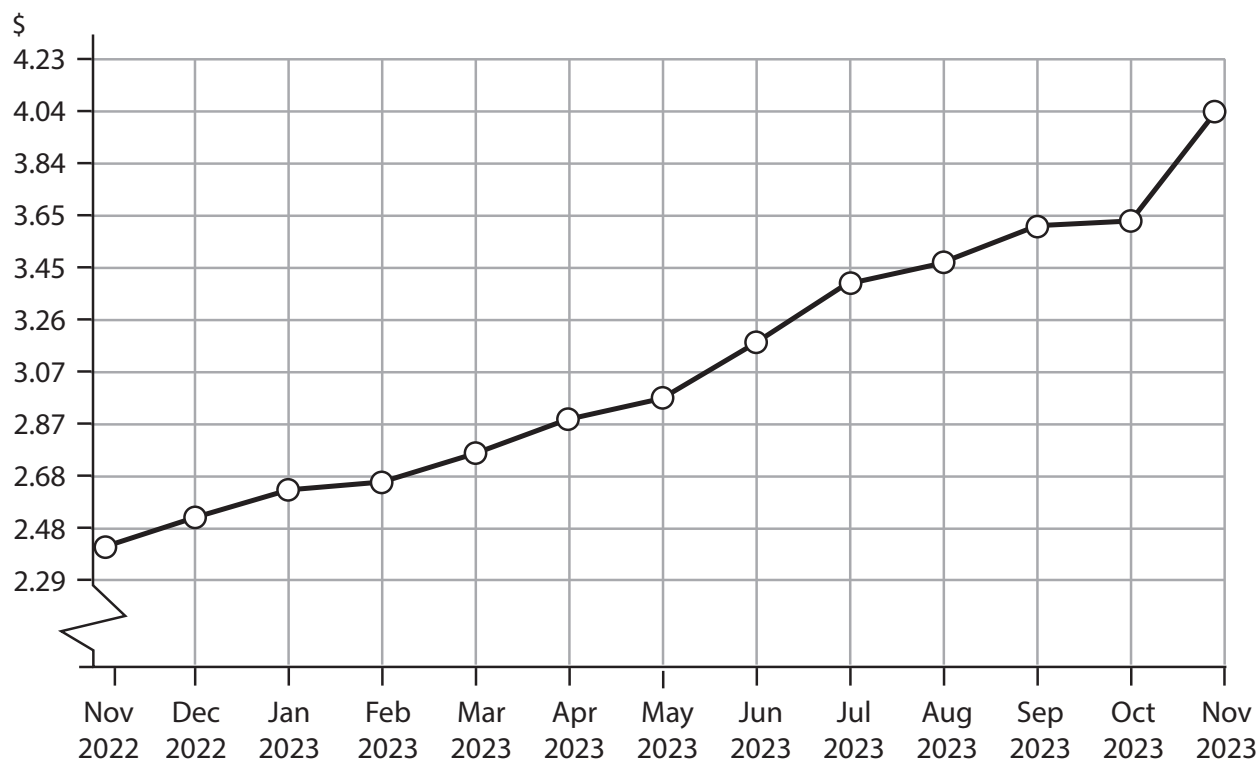
Study Figures 1 and 2 and Extracts A, B and C in the Source Booklet before answering Question 12.

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

- 12** (a) Define the term 'forward market'. (Extract A, line 10) (2)
- (b) With reference to Figure 1 and Extract A, analyse **one** supply factor and **one** demand factor that caused the price of cocoa to increase by approximately 68% between November 2022 and November 2023. (6)
- Illustrate your answer with a supply and demand diagram.
- (c) With reference to Figure 2, explain the term 'price inelastic supply'. Refer to the short-run and the long-run in your answer. (4)
- (d) With reference to Extract C, examine **two** effects of the Government of Ghana's decision to end the subsidies paid to cocoa farmers. (8)
- (e) With reference to Extract B, discuss the likely external costs associated with cocoa production. (14)
- Illustrate your answer with an externalities diagram.

Sources for use with Section C.

The cocoa market

Figure 1 World price of cocoa, dollars per kilogram, November 2022 to November 2023**Extract A Cocoa price rises rapidly**

By November 2023 cocoa prices were at their highest level for 46 years. Between November 2022 and November 2023 prices increased by approximately 68%.

Côte d'Ivoire, the world's largest grower, experienced a 36.3% decrease in production compared to the previous year. Flooding and swollen shoot disease on cocoa farms caused this significant fall in cocoa production.

5

More cocoa has been required by the chocolate and drinking chocolate markets. There is growing evidence of the health benefits of cocoa so chocolate makers and drinking chocolate makers have been increasing the cocoa content in their products.

The forward market price for cocoa for six months' time more than doubled between April 2023 and April 2024.

10



Figure 2 Estimated price elasticity of supply for cocoa

	Estimated elasticity
Short-run price elasticity of supply	+0.07
Long-run price elasticity of supply	+0.57

Extract B The true cost of cocoa production

Cocoa farming has resulted in the loss of large areas of rainforest. Over the last three decades the increase in cocoa farming has resulted in a 70% loss of the forests in Ghana and Côte d'Ivoire.

Between 2014 and 2019 the use of pesticides in the production of cocoa increased by 20% in Ghana and Côte d'Ivoire. These pesticides are often highly hazardous and may cause cancer. In addition, they can pollute drinking water and rivers. 5

The percentage of earnings for each sector involved in the chocolate market is as follows:

- Cocoa farmers 6.6%
- Transport businesses 2.1% 10
- Processors 7.6%
- Marketing businesses 4.3%
- Chocolate manufacturers 35.2%
- Retailers 44.2%

Many cocoa farmers have difficulty in meeting their basic needs. Some are even unable to afford sufficient food, shelter or clothing. As farmers struggle to survive financially, many now employ children. Between 2009 and 2019 the percentage of workers on cocoa plantations who were children increased from 5% to 24% in Ghana and Côte d'Ivoire. 15

Extract C Subsidies for cocoa farmers in Ghana

Between 2019 and 2020 the Government of Ghana increased the amount it spent subsidising cocoa farmers from \$200 million to \$400 million. The funds were paid to enable farmers to purchase fertiliser and to ensure that farmers' incomes were not too low. However, the Government found it difficult to fund these payments to cocoa farmers and it decided to end these subsidies in 2023. 5





(c) With reference to Figure 2, explain the term ‘price inelastic supply’. Refer to the short-run and the long-run in your answer.

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- 10** The table shows the average price of green coffee beans and the global output of green coffee beans in February 2023 and in February 2024.

	Price of green coffee beans per lb	Output of green coffee beans (tonnes)
February 2023	\$1.61	8 510 000
February 2024	\$1.82	11 550 000

Ceteris paribus, calculate the price elasticity of supply for green coffee beans.

Show your workings.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

(Total for Question 10 = 4 marks)



SECTION C

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

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

- 12** (a) Define the term 'public good'. (Extract A, line 13) (2)
- (b) With reference to Figure 1 and Extract A, analyse **two** factors that caused the average world price of transporting goods in shipping containers to rise rapidly. Illustrate your answer with a supply and demand diagram. (6)
- (c) With reference to Extract B, explain the difference between price inelastic supply and price elastic supply. (4)
- (d) With reference to Extract C, examine **two** external costs associated with container ships. (8)
- (e) With reference to Extract C and your own knowledge, discuss the likely benefits of subsidies paid to the manufacturers of wind sails. Illustrate your answer with a supply and demand diagram. (14)

Sources for use with Section C

Container shipping

Figure 1 Average world price of transporting goods in a shipping container, dollars per 40-foot container, March 2023 and March 2024

	Price (\$)
March 2023	2 172
March 2024	3 411

Extract A Shipping container costs rise rapidly

The shortest and cheapest shipping route from Asia to Europe and North America passes through the Red Sea and via the Suez Canal, Egypt. Between November 2023 and April 2024 there were 133 attacks by pirates on ships in the Red Sea travelling to the Suez Canal. In response, 62% of container ships diverted to an alternative route. This adds 6 550 km to the journey and takes an extra 10–15 days. The additional cost of fuel per container ship is estimated at \$1 million.

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Additionally, other costs rose. For example, the wages of workers on container ships increased. Interest rates also increased, adding to the cost of borrowing.

Diverted ships have to travel through dangerous waters under the southern tip of Africa. There are 2 300 shipwrecks along the South African coastline. However, 45 active lighthouses along this coastline help ships through these dangerous waters. The Government of South Africa provides lighthouses as a public good.

10

Extract B The supply of container ships

With ships taking longer on journeys, more ships are required. Between 2023 and 2024 the top ten container shipping companies ordered 569 new ships. It will take 12–16 months to build one new container ship. This number of orders means that the shipping companies will have an even longer wait before the ships are received. However, only 65% of capacity on container ships is typically used.

5



Extract C Environmental impact of container ships

The transportation of goods by container ships has a number of environmental impacts:

- 2% of global CO₂ emissions come from container ships
- the low-grade fuel used by the world's 90 000 container ships contains 2 000 times the amount of sulfur compared to diesel fuel used in cars 5
- in one year, a single large container ship can emit cancer-causing and asthma-causing pollutants equivalent to that of 50 million cars
- the hum of ship engines affects marine life, disrupting communication and navigation for animals such as whales and dolphins
- oil spills, sewage and chemical waste discharged by container ships contribute to water pollution. 10

However, between 2008 and 2023, carbon emissions were reduced by 30% through measures to reduce fuel consumption.

BAR Technologies, an engineering business, has developed wind sails that can be attached to container ships. In the first trial in 2023, these wind sails helped to reduce fuel consumption. This reduced carbon emissions from each ship by 11.2 tonnes of CO₂ per day. Over one year this would be the equivalent of removing 480 cars from the roads. With such environmental benefits some economists suggest that subsidies should be paid to manufacturers of wind sails. 15

(4)



SECTION C

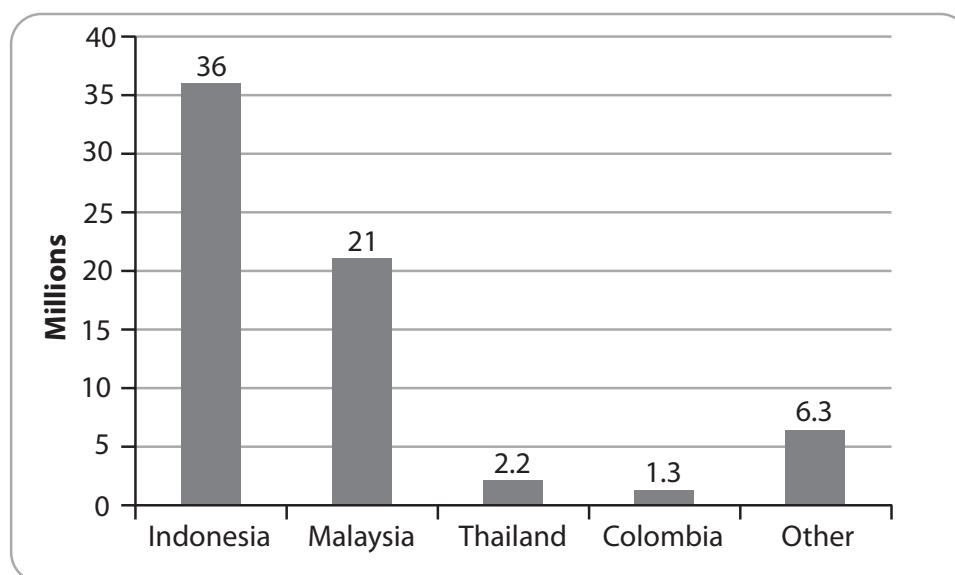
Study Figures 1 and 2 and Extracts A and B in the Source Booklet before answering Question 12.

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

- 12** (a) Define the term 'equilibrium' (Extract A, line 2). (2)
- (b) With reference to Extract A, explain the impact of the availability of substitutes on the price elasticity of demand for palm oil. (4)
- (c) With reference to the information provided, analyse **two** reasons why the price of palm oil decreased in 2018. (6)
- Illustrate your answer with a supply and demand diagram.
- (d) With reference to Figure 2 and Extract A, examine the likely price elasticity of supply for palm oil. (8)
- (e) With reference to Extract B, discuss the externalities associated with the production of palm oil. (14)
- Illustrate your answer with an appropriate diagram.

Sources for use with Section C.**The global market for palm oil****Figure 1 Price changes of selected vegetable oils, 2018**

Type of vegetable oil	% price change
Palm	-25.94
Rapeseed	-12.71
Soybean	-17.75
Sunflower	-12.81

Figure 2 Global palm oil production in 2017 (million tonnes)

Extract A Palm oil price falls

The equilibrium price of palm oil decreased in 2018. The price of competing vegetable oils, including rapeseed, soybean and sunflower also fell in 2018. Palm oil is used in the production of biodiesel, a substitute for crude oil. Lower crude oil prices during 2018 caused a fall in the demand for biodiesel.

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More palm oil was produced in 2018 than was consumed. This abundant supply led to a stockpile of three million tonnes. When first planted, palm trees can take up to 30 months to produce fruit. The fruit can then be harvested twice a year and converted into palm oil.

Extract B Palm oil production

Palm oil production more than tripled between 1998 and 2018. It is now used in many goods including processed foods, cosmetics, detergents, chocolate and biodiesel.

Palm oil requires one-tenth of the land, one-seventh of the fertiliser and only one-sixth of the energy to produce the same amount of oil as soybean. In Indonesia and Malaysia more than 4.7 million workers are employed directly in the palm oil industry. A further 11 million workers are employed indirectly.

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The rapid and poorly managed expansion of production has caused large-scale deforestation. The clearing and burning of tropical rainforests has also caused significant greenhouse gas emissions.

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Palm oil production in Indonesia and Malaysia has led to habitat and biodiversity loss. Endangered animals have been negatively affected. For example, between 2001 and 2017 the population of orangutans fell by 100 000 in these countries. Orangutans spend 95% of their time in trees and Indonesian rainforests have been disappearing rapidly. In western Indonesia 69% of elephant habitats have been lost and there are only 100 rhinos left in the wild.

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(d) With reference to Figure 2 and Extract A, examine the likely price elasticity of supply for palm oil.

(8)





SECTION D

Answer ONE question from this section.

Write your answer in the space provided.

EITHER

- 13** In Australia a consumer of electricity would save, on average, AUS\$1 000 by switching from the most expensive to the least expensive electricity supplier. However, 30% of consumers do not switch because of the effort required and 22% do not switch because they lack the necessary information.

Evaluate possible reasons why consumers may behave irrationally.

(Total for Question 13 = 20 marks)

OR

- 14** Between Q4 2016 and Q4 2019 the global price of gold increased from \$1 275 to \$1 481 per ounce. Over the same period, the global supply of gold increased from 888.8 tonnes to 889.5 tonnes. Only 10 countries mine 62% of global output.

Evaluate reasons why the supply of gold is price inelastic.

(Total for Question 14 = 20 marks)



MARK SCHEMES

official mark schemes, in the same order as the questions



Section C

Question	Define the term 'supply'. (Extract A, line 8)	Mark
	Answer	
12 (a)	Knowledge 2 Up to 2 marks for defining 'supply', e.g.: • The amount/quantity firms are willing to sell/ The amount of goods firms make available for sale (1) • At any given price/in a time period/ for consumers to purchase in the market (1) • 'The global supply of energy produced from renewable resources is expected to increase by 8% in 2022' (1)	(2)

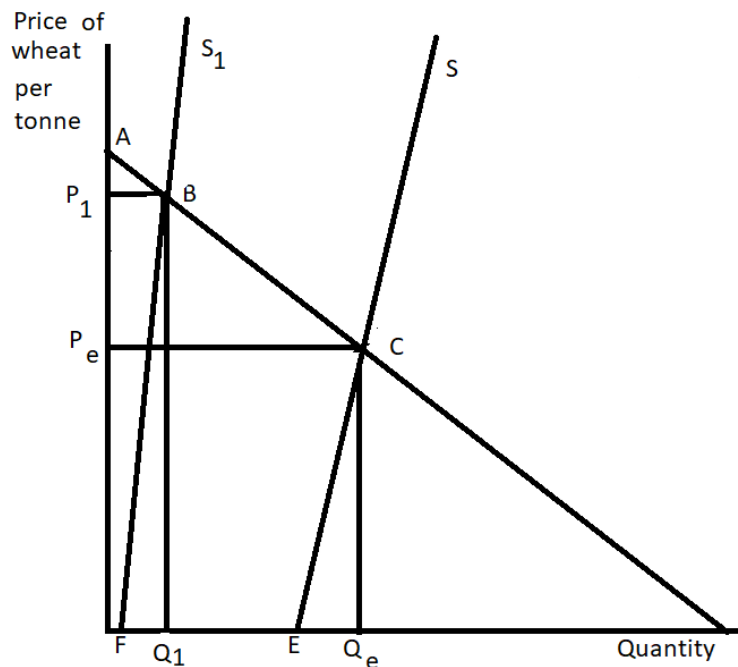
Question	With reference to Figure 2 and Extract A, analyse two possible reasons for the increase in supply of coffee beans between 2015 and 2019. Answer	Mark
7(c)	Knowledge 2 Application 2 Analysis 2 Quantitative skills assessed: QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge and Analysis 1 mark for definition of supply- the quantity of goods that suppliers are willing to sell at a given price in a given time period (1) Up to 2 marks for the identification of two reasons for the increase in supply of coffee and 1 mark for the linked expansion of each point - Favourable weather conditions (1K) enables crops to grow, increasing the harvest yield, increasing supply (1AN) - Improvements in farming equipment (1K) improvements in technology improves productive efficiency, increasing output and increasing supply (1AN) - Improvements in farming methods of production (1K) improves the efficiency of factors of production used in farming, increasing output (1AN) Application Up to 2 marks for application to Figure 2 and Extract A - Global coffee production rose from 150 million bags in 2015 to 171 million bags in 2019 (1) - World coffee bean supply increased by 8.2% in 2019 (Figure 2)/ supply increased 8% (Extract A) (1) - Global coffee bean surplus of 4 million bags (1) - Large coffee farming countries such as Brazil had increased production (1)	(6)

Question	With reference to Extract B, examine two barriers to entry into the US coffee shop market.	Mark
7(d)	Knowledge 2 Application 2 Analysis 2 Evaluation 2 Quantitative skills assessed: QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge and Analysis Up to 1 mark for the correct definition of barriers to entry Definition of Barriers to entry – obstacles that prevent new firms from entering the market (1) up to 2 knowledge marks for identification of two barriers to entry and 1 mark for the linked expansion of each barrier to entry (2+2) • A number of well-known firms operating in the coffee chain market (1K), making it more difficult for a new firm to establish itself because of brand loyalty, this increases barriers to entry (1AN) • Firms compete using non-price competition such as advertising. (1K) This increases the costs of operating in the market and may prevent new firms entering if they cannot afford to cover the costs of large advertising campaigns (1AN) • New firms will need to develop high quality coffee beans to compete with established coffee chains (1K) This requires expertise that a new firm may not have (1AN) • Firms will need to compete using social media (1K). This requires knowledge of social media and the ability to finance the campaign. This would increase barriers to entry to new firms (1AN) Application Up to 2 marks for relevant application to Extract B (1+1) • Starbucks, Tim Hortons, Dunkin' Donuts, Dutch Bros Coffee and Peet's Coffee operate in the market (1) • US coffee shop market is likely to be oligopolistic (1) • Starbucks large with 27 000 stores worldwide (1) • The firms compete using special offers, large advertising budgets and loyalty schemes (1)	

Question	With reference to Extract A, examine two likely effects of an increase in the price of copper on plumbing firms that replace water pipes in customers' homes.	Mark
12(d)	Answer QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms Knowledge 2, Application 2, Analysis 2, Evaluation 2 Knowledge and Analysis Up to 2 marks for identifying two effects and up to 2 marks for linked explanations, e.g.: • Plumbing firms will experience increased costs (1K) so supply will shift left/decrease (1An) • Producer surplus will decrease (1K) as price rises and quantity falls (1An) • Plumbing firms may substitute to cheaper alternatives (1K) which may reduce the quality of the plumber's job (1An) • Plumbing firms may experience reduced profits (1K) as a result of higher costs if they use copper piping (1An) • Plumbers may have to increase their prices (1K) resulting in a decrease in demand (1An) Application Up to 2 marks for reference to Extract A/data • 44% increase in price of copper/price increase from below \$5 100 to \$7 100 (1) • Most plumbers prefer to use copper pipes/costs of copper pipes will rise/price of copper pipes increase significantly in the future (1) • Reward up to two marks for relevant diagram Evaluation Up to 2 marks for evaluative comments, e.g.: • Magnitude of costs- a 44% copper price increase is substantial and could increase costs considerably (1+1) • Depends on how important copper pipes are as a proportion of total costs (1+1) • Depends on how much the copper pipe manufacturer absorbs (price elastic demand)/passes on the increase in costs (price inelastic demand) (1+1)	(8)

- | | | |
|--|--|--|
| | <ul style="list-style-type: none">• Plumbing firms prefer copper pipes so it is very likely they will avoid substituting to alternatives (1+1)• Depends on the price elasticity of demand for plumbing services, if inelastic then revenue or profit may fall (1+1)• Plumbers may have stockpiled copper pipes so will not experience the rise in costs (1+1) | |
|--|--|--|

Question	Evaluate the impact of the 400% increase in the cost of fertiliser on farmers and households. Include one diagram to show the impact on farmers in your answer. Indicative content
14	QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Indicative content guidance Answers must be credited by using the level descriptors (below) in line with the general marking guidance. The indicative content below exemplifies some of the points that candidates may make but this does not imply that any of these must be included. Other relevant points must also be credited. Knowledge, application and analysis (12 marks) – indicative content 400% increase in costs Farmers • Increased costs of production • Supply shifts left, S to S_1 • Demand contracts • Price increases, P_e to P_1 • Quantity decreases, Q_e to Q_1 • Decreased consumer surplus, ACP_e to ABP_1 • Decreased producer surplus • Some may exit the market as profits fall • If less fertiliser is used, productivity may fall leading to a fall in income for farmers



Households

- 38% increase in global food price index
- Pay more in farm shops/for food in supermarkets
- Consumer surplus falls
- Food less affordable
- Demand for food very price inelastic meaning that consumers spend a higher proportion of their income on food
- Less income left to spend on other (non-food) goods and services
- Decrease demand for other goods e.g. electronics and entertainment

NB Maximum Level 3 if farmers or households omitted

NB Maximum Level 3 if no relevant diagram drawn

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	Displays isolated, superficial or imprecise knowledge and understanding of economic terms, principles, concepts, theories and models. Use of generic material or irrelevant information or inappropriate examples. Descriptive approach, which has no chains of reasoning.
Level 2	4–6	Displays elements of knowledge and understanding of economic terms, principles, concepts, theories and models. Limited application of knowledge and understanding to economic problems in context. A narrow response or superficial, only two-stage chains of reasoning in terms of cause and/or consequence.
Level 3	7–9	Demonstrates accurate knowledge and understanding of economic terms, principles, concepts, theories and models. Ability to apply knowledge and understanding to some elements of the question. Some evidence and contextual references are evident in the answer. Analysis is clear and coherent. Chains of reasoning in terms of cause and/or consequence are evident but they may not be developed fully or some stages are omitted.
Level 4	10–12	Demonstrates accurate and precise knowledge and understanding of economic terms, principles, concepts, theories and models. Ability to link knowledge and understanding in context using appropriate examples which are fully integrated to address the broad elements of the question. Analysis is clear, coherent, relevant and focused. The answer demonstrates logical and multi-stage chains of reasoning in terms of cause and/or consequence.



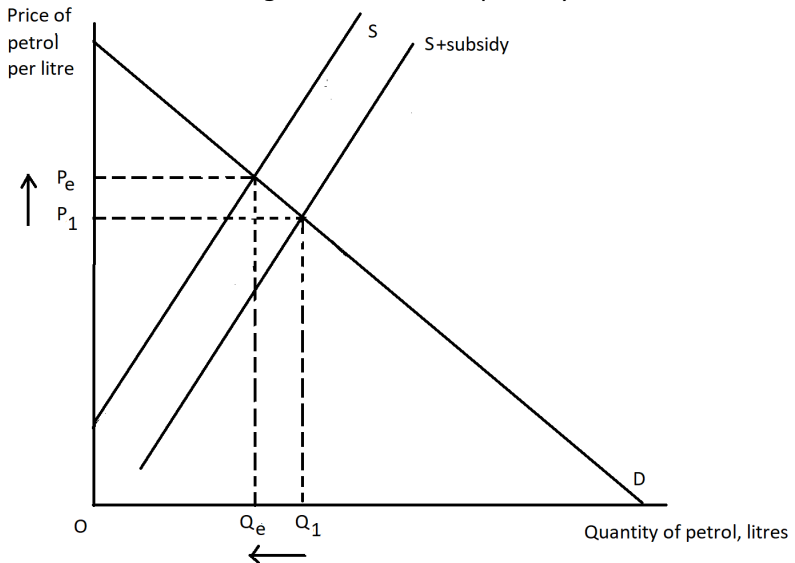
	Evaluation (8 marks) – indicative content • Magnitude of the increase in fertiliser costs is significant so the impact on costs is large • The magnitude of the increase in the global food price index is much smaller than the increase in the cost of fertiliser/represents significant costs to households • Depends on the proportion of total production costs that are accounted for by fertiliser • The impact will depend on how long the prices remain high • Organic farmers who do not use fertiliser will benefit as their competitors producing non-organic good will suffer • Depends on how other costs change • Use of fertiliser may fall- reducing external costs of production- impact on wildlife • Farmers may absorb some of the increases in costs and not pass on price increases • Price elasticity of demand- if inelastic there will be only small changes in quantity • Impact greatest on low-income households as food costs will make up greater proportion of income • Government policy can alleviate the issue- accept specific examples
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Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	Identification of generic evaluative comments. No supporting evidence/reference to context. No evidence of a logical chain of reasoning.
Level 2	4–6	Evidence of evaluation of alternative approaches. Some supporting evidence/reference to context. Evaluation is supported by a partially-developed chain of reasoning.
Level 3	7–8	Evaluation recognises different viewpoints and/or is critical of the evidence, leading to an informed judgement. Appropriate reference to evidence/context. Evaluation is supported by a logical chain of reasoning.

Section A

Question Number	Quantitative skills assessed	Answer	Mark
1	–	B	(1)
2	–	A	(1)
3	–	D	(1)
4	QS9: Interpret, apply and analyse information in written, graphical and tabular forms	B	(1)
5	QS9: Interpret, apply and analyse information in written, graphical and tabular forms	C	(1)
6	QS8: Make and interpret calculations of elasticity	D	(1)

Section B

Question Number	In 2016 the Nigerian Government removed the subsidy on petrol. Draw a diagram to illustrate the impact of the removal of the subsidy on the equilibrium price and quantity of petrol. Answer	Mark
7	Knowledge 1, Application 3 Quantitative skills assessed: QS4: Construct and interpret a range of standard graphical forms QS9: Interpret, apply and analyse information in written, graphical and tabular forms. Knowledge 1 mark for drawing original supply and demand (they do not have to include market equilibrium). Application Up to 3 marks for the following information included on diagram: 1 mark for drawing a supply curve to the left of original 1 mark for labelling the new higher price 1 mark for labelling the new lower quantity. 	(4)

Question	Quantitative skills assessed	Answer	Mark
1	–	B	(1)
2	–	A	(1)
3	–	D	(1)
4	QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms	C	(1)
5	QS8: Make calculations of elasticity and interpret the result	C	(1)
6	QS8: Make calculations of elasticity and interpret the result	B	(1)

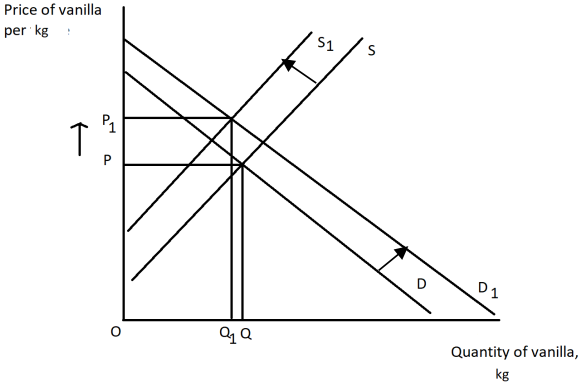
4	QS4: Construct and interpret a range of standard graphical forms QS8: Make calculations of elasticity and interpret the results QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms	The only correct answer is D A is not correct because the change in price and quantity are both positive so the PES will be positive B is not correct because the value of PES is positive as both price and quantity increase C is not correct because this has been calculated using the formula the wrong way round	(1)
5	QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms	The only correct answer is A B is not correct because the government intervention causes the net welfare loss not the market C is not correct because this is positions above the PPF D is not correct because this is when consumers do not have the energy to find better deals	(1)
6	QS4: Construct and interpret a range of standard graphical forms QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms	The only correct answer is D A is not correct because position Y is unobtainable B is not correct because the opportunity costs is in terms of consumer goods C is not correct because the movement shows a decrease in unemployed resources	(1)

5	QS2 Calculate, use and understand percentages, percentage changes and percentage point changes QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms	The only correct answer is B A is not correct because Denmark generated more non-renewable resources in 2010 and more renewable resources in 2021 C is not correct because a higher proportion of electricity was generated from non-renewable resources in 2010 D is not correct because a higher proportion of electricity was generated using renewable resources in 2021	(1)
6	QS2 Calculate, use and understand percentages, percentage changes and percentage point changes QS8: Make calculations of elasticity and interpret the result QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms	The only correct answer is A B is not correct because the supply of new houses would decrease C is not correct because the supply of new houses would decrease D is not correct because the PES has been divided by the price change	(1)

Question Number	With reference to Extract A, explain one factor that is likely to influence the price elasticity of supply for cocoa beans.	Mark
12 (b)	Knowledge 2 Application 2 Knowledge Up to 2 marks for relevant definitions - The responsiveness of quantity supplied to a change in the price (1). OR - Formula for PES: $\frac{\% \text{ change in quantity supplied}}{\% \text{ change in price}} \quad \textbf{(1)}$ - Elastic supply is where elasticity is greater than 1/ where a change in price will see a greater percentage change in quantity supplied (1). - Inelastic supply is where elasticity is between 0 and 1/ where a change in price will see a smaller percentage change in quantity supplied (1). Application Up to 2 marks for application to cocoa production, e.g.: - Stocks being 27.3% higher than in 2016 (1) so cocoa can be supplied from these stocks if the price rises so elastic (1). - It takes four to five years for cocoa trees to reach maturity (1) so it will take a long time to increase supply of cocoa so inelastic (1). - Cocoa can only be grown near the equator (1) so it is difficult to increase supply making it inelastic (1).	(4)

Question Number	With reference to Figure 1 and Extract A, analyse one reason why the price of cocoa beans 'fell below \$2 000 per tonne' (Extract A, line 8) in April 2017. Illustrate your answer with a supply and demand diagram.	Mark
12 (c)	Knowledge 2, Application 2, Analysis 2 Quantitative skills assessed: QS4: Construct and interpret a range of standard graphical forms QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge Up to 2 marks for the diagram showing: • Original supply, demand and equilibrium (1). • Correct shift in supply (1). Analysis 1 marks for development of how the reason leads to lower prices, e.g.: • Cote d'Ivoire production rising meaning that at any given price supply is higher (1). • The trees maturing means the growers are able to supply more cocoa at a lower cost (1). • Good harvests lead to excess supply at original price, so causing downward pressure on price (1). 1 mark for using diagram to show impact of the change in supply on equilibrium price: • New equilibrium showing lower price (1) Application Up to 2 marks: 1 mark for interpreting data from Figure 1: • showing the price above \$2 000 before April 2017 e.g. August 2016 \$3 000 (1) Or may be shown in diagram Up to 2 marks for using data from Extract A: • Cote d'Ivoire production rose from 1.45m tonnes to 1.93m tonnes /a good harvest/ stocks 27.3% higher/ new trees maturing (1+1).	(6)

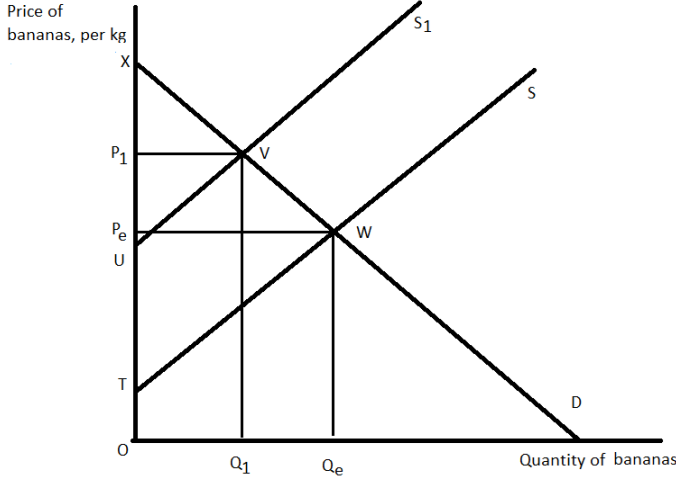
Question	Explain what is meant by the term 'inelastic supply'. Refer to Figure 1 and Extract A in your answer.	Mark
	Answer	
12 (b)	Knowledge 2 Application 2 Knowledge Up to 2 marks for definitions of inelastic supply: • Where the price elasticity of supply is between 0 and 1 (1) • Where an increase in price leads to a smaller proportionate increase in quantity supplied (1) • Diagram to show inelastic supply (1) (1) Application 1 mark for application to Figure 1: • In Madagascar the supply is price inelastic at +0.48 (1) • In Indonesia the price elasticity of supply is +0.52 (1) • Vanilla from Madagascar has more inelastic supply than Indonesia at +0.48 (1) • Vanilla from Indonesia also has inelastic supply although it is more elastic than Madagascar (1) • The elasticities of supply of vanilla from Madagascar and Indonesia are both between 0 and 1 making them inelastic (1) 1 mark for application to Extract A • 'it takes 3 years for the vanilla crop to mature' showing inelastic as takes time to supply (1) • 'Few other countries have the climate to be able to grow the crop' so it is not easy for other countries to supply the crop (1) • 'some farmers will not see their vanilla crops recover fully until 2020' showing it takes time for supply to adjust/respond (1)	(4)

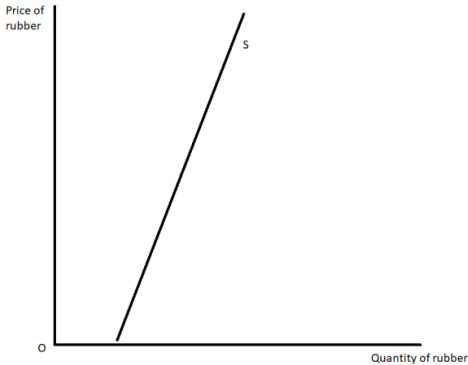
Question	Analyse why the price of vanilla increased significantly between 2014 and 2018. Refer to Figure 2 and Extract A in your answer. Illustrate your answer with a supply and demand diagram. Answer	Mark
12 (c)	Knowledge 2, Application 2, Analysis 2 Quantitative skills assessed: QS4: Construct and interpret a range of standard graphical forms QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge Up to 2 marks for the diagram showing: • Original supply, demand and equilibrium (1) • Final equilibrium showing higher price (1) Analysis Up to 2 marks for identification of one reason linked to demand and one linked to supply which leads to higher prices, e.g.: • 2017 cyclone destroyed crop and reduced supply (1) • In recent years consumers switched to natural vanilla/ Consumers switched away from vanilla substitutes, e.g. vanillan/ • Rapid growth in demand for ice cream, sweets, chocolate and in cosmetic products which use vanilla (1) Application 1 mark for reference to Figure 2 • Price rises from \$140 per kg to \$600 per kg/ by \$460/ by 328.6% (1) Up to 2 marks for diagram: • Leftwards shift in supply (1) • Rightwards shift in demand (1) 	(6)

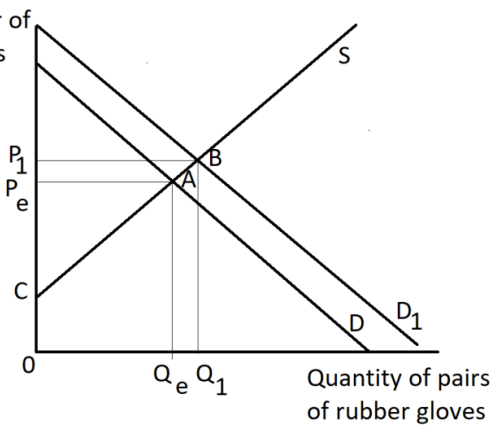
Question Number	With reference to Extract A, explain one factor that is likely to influence the price elasticity of supply for sugar.	Mark
	Answer	
12(b)	Knowledge 2 Application 2 Knowledge 1 mark for definition or formula of PES: <u>% change in quantity supplied</u> % change in price Or definition of price elastic or inelastic supply (1) 1 mark for identification of one factor: • Storage capacity • Time it takes sugar crops to reach maturity • Number of producing countries • Ease of switching production • Ability to store good (1) Application Up to 2 marks for application: • Excess supply is 17 million tonnes (1) so there will be stocks of sugar making supply more elastic (1) • Large quantities being held in storage (1) which can be released quickly making supply more elastic (1) • 119 countries grow sugar (1) suggesting supply can be increased in response to a change in price, so supply is relatively elastic (1) • It takes one year in warm countries to grow sugar (1) suggesting supply is relatively elastic (1) • It takes two years in cooler countries to grow sugar (1) suggesting supply is relatively inelastic (1)	(4)

Question Number	With reference to Figure 1 and Extract A, analyse two reasons why the world price of sugar fell between August 2017 and August 2018. Illustrate your answer with a supply and demand diagram. Answer	Mark
12(c)	Knowledge 2, Application 2, Analysis 2 Quantitative skills assessed: QS4: Construct and interpret a range of standard graphical forms QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge Up to 2 marks for the diagram showing: • Original supply, demand and equilibrium (1) • Final equilibrium showing lower price (1) Analysis Up to 2 marks for any two reasons below: Supply factors • Favourable weather (1) • Good harvests (1) • Indian Government subsidising sugar production (1) • India/Thailand had record levels of production/helping to increase global production to 11% higher than in 2017 (1) Demand factors • Consumption of sugar has fallen because of increasing health concerns (1) • Competition from substitutes such as artificial sweeteners (1) • In the USA/Europe/China/Australia sugar consumption has fallen (1) NB accept two demand or two supply factors or one of each Application 1 mark for reference to Figure 1 • Price decreased by \$0.08/25% (1) Up to 2 marks for diagram: • Rightwards shift in supply (1) • Leftwards shift in demand (1)	

Question	<i>Ceteris paribus</i> , calculate the price elasticity of supply for coffee beans. Show your workings.	Mark
	Answer	
10	Knowledge 1, Application 3 Quantitative skills assessed: QS8: Make calculations of elasticity and interpret the result. QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge 1 mark for definition/the formula for price elasticity of supply <u>% change in quantity supplied</u> % change in price Application Up to 3 marks for calculations: - Change in quantity supplied ÷ original quantity supplied x100 $-1.6 \div 169 \times 100 = -0.9467\%$ (1) - Change in price ÷ original price x100 $-0.34 \div 1.36 \times 100 = -25\%$ (1) <u>% change in quantity supplied</u> % change in price $-0.9467 \div -25 = 0.04$ (1) NB: if correct answer (e.g. 0.04/0.038/0.0379/0.037868/0.0378698225) is given, award full marks regardless of working. NB: other appropriate working is rewarded	(4)

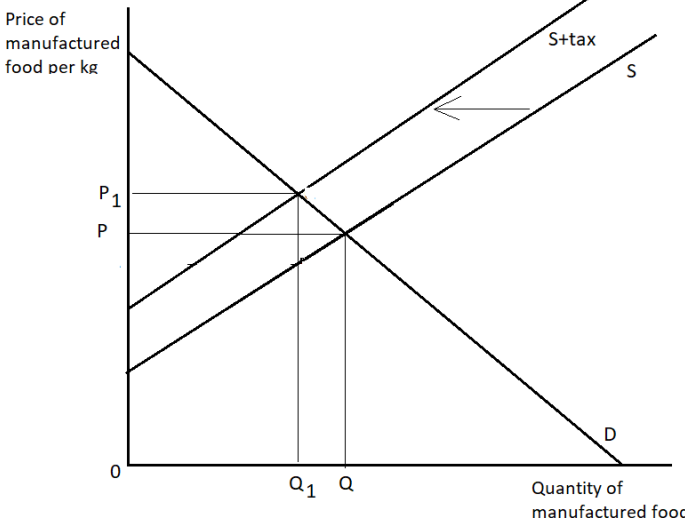
Question	Between January 2020 and May 2020 the price of bananas charged by retailers in the USA increased from \$1.17 to \$1.30 per kg. This was mainly caused by increased costs of transportation from banana growers to markets in North America. Explain the likely impact of this change in price on consumer surplus. Illustrate your answer with a diagram. Answer	Mark
11	Knowledge 1, Application 1, Analysis 2 Quantitative skills assessed: QS4: Construct and interpret a range of standard graphical forms Knowledge 1 mark for defining consumer surplus - Consumer surplus is the difference between the price which consumers are willing to pay and the market price/gap between the equilibrium price and the demand curve (1) Application 1 mark for the following diagram, showing the correct shift in supply  Analysis Up to 2 marks for likely impact on consumer surplus - Consumer surplus is originally P_eWX (1) - Consumer surplus decreases (1) to P_1VX (1) - Consumer surplus decreases (1) by P_eP_1VW (1)	(4)

Question	With reference to the first paragraph of Extract B, explain what is meant by 'the supply of rubber is price inelastic'	Mark
	Answer	
12 (c)	QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge 2 marks for understanding of price inelastic supply • Price inelastic supply is where a change in price results in a less than proportionate change in quantity supplied (1) • Where PES is between 0 and 1 (1) • Supply cannot respond quickly to a change in price (1) • Diagram to show (perfectly or relatively) price inelastic supply (1)  Application Up to 2 marks for application: • Trees only grow where there is heavy rainfall (1) • Trees only grow with temperatures between 20-35°C (1) • Thailand, Indonesia, China, West Africa supply 85% of the market (1) • 6 years before rubber trees produce a crop (1)	(4)

Question	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.	Mark
	Answer	
12(d)	QS4: Construct and interpret a range of standard graphical forms QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms Knowledge 2, Application 2, Analysis 2, Evaluation 2 Knowledge 1 mark for definition of producer surplus Producer surplus is the difference between the price firms are willing to sell at and the market price (1) 1 mark for original supply and demand and equilibrium (1) Application • Rapidly rising demand for rubber gloves/increased number of sales to healthcare sector/366% increase in profits in Q2 at Top Glove (1) • Diagram showing demand shifting right (1) Analysis • Original producer surplus ACP_e (1) and New producer surplus BCP_1 (1) OR • Producer surplus increases (1) by ABP_1P_e (1) Price per pair of rubber gloves  Quantity of pairs of rubber gloves Evaluation Up to 2 marks for evaluative comments (2+0 or 1+1), e.g.: • Magnitude of change in producer surplus significant (1) as indicated by 366% increase in profits for Top Glove (1)	

(8)

Question	Ceteris paribus, calculate the price elasticity of supply of wheat. Show your workings.	Mark
	Answer	
10	Knowledge 1, Application 3 Quantitative skills assessed: QS8: Make calculations of elasticity and interpret the result. QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge 1 mark for definition/the formula for price elasticity of supply $\frac{\% \text{ change in quantity supplied}}{\% \text{ change in price}}$ OR 1 mark for identifying that the good has relatively price inelastic supply/The PES is inelastic as a fall in price sees quantity supplied change by a smaller percentage (1) Application Up to 3 marks for calculations: - Change in quantity ÷ original quantity x 100 $45\text{m} \div 732\text{m} \times 100 = 6.15\% \text{ (1)}$ - Change in price ÷ original price x 100 $23.51 \div 152.97 \times 100 = 15.37\% \text{ (1)}$ $\frac{\% \text{ change in quantity supplied}}{\% \text{ change in price}}$ $6.15 \div 15.37 = 0.40 \text{ (1)}$ NB: if correct answer (e.g. 0.399995/0.40) is given, award full marks regardless of working. NB 0.40% is awarded 3 marks	(4)

Question	Explain the impact of the introduction of this indirect tax on the market for food products containing salt added by manufacturers. Illustrate your answer with an appropriate diagram. Answer	Mark
11	Knowledge 1, Application 1, Analysis 2 Quantitative skills assessed: QS4: Construct and interpret a range of standard graphical forms QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge 1 mark for definition of indirect tax e.g.: Indirect tax is an expenditure tax/consumption of goods and services (1) Application 1 mark for the following diagram, showing a specific tax where the supply curve shifts to the left rather than pivots  Analysis 1 mark for showing the change in price - Price increases from P to P_1 (1) 1 mark for showing change in quantity - Quantity decreases from Q to Q_1 (1)	(4)

Question	With reference to the second paragraph of Extract A, explain the phrase 'the supply of semiconductors is inelastic.'	Mark
12 (b)	Answer	
	QS8: Make calculations of elasticity and interpret the result. QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge 2 Application 2 Knowledge 2 marks for understanding of inelastic supply: • Inelastic supply is where a change in price results in a less than proportionate change in quantity supplied (1) • Where PES is between 0 and 1 (1) • Supply cannot respond quickly to a change in price (1) • Percentage change in price is greater than the percentage change in quantity supplied (1) • Diagram to show (perfectly or relatively) inelastic supply (1) The diagram illustrates a supply curve for semiconductors. The vertical axis represents the price per semiconductor, and the horizontal axis represents the quantity of semiconductors. A steep, upward-sloping line, labeled 'S', starts from the horizontal axis and rises sharply, indicating that the supply is inelastic. The origin is marked with 'O'. Application Up to 2 marks for application: • Operating at full capacity (1) • Struggled to respond to increased demand (1) • Semiconductor manufacturers will take time for additional capacity to become operational (1)	(4)

Question	With reference to Extract A, analyse two reasons why semiconductor prices 'increased on average by 20%'. Illustrate your answer with a supply and demand diagram. Answer	Mark
12 (c)	Knowledge 2, Application 2, Analysis 2 Quantitative skills assessed: QS4: Construct and interpret a range of standard graphical forms QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge Up to 2 marks for the diagram showing: • Original supply, demand, equilibrium price and quantity (1) • Final equilibrium with both curves shifted correctly showing higher price (1) Analysis 1 mark for analysis linked to supply e.g.: • Costs of steel and copper increased (1) 1 mark for analysis linked to demand e.g.: • Global health crisis led to increased demand for semiconductors used in production of laptops/tablets/smartphones (1) Application 2 marks for diagram: • Rightwards shift in demand (1) • Leftwards shift in supply (1)	

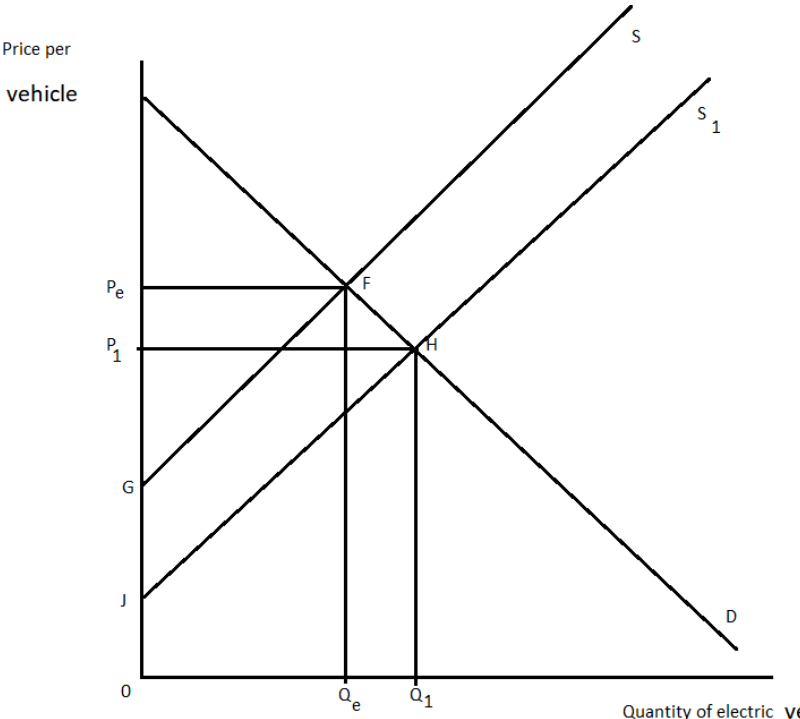
Question	With reference to Extract B, explain why the supply of new houses is likely to be price inelastic. Answer	Mark
12 (c)	QS8: Make calculations of elasticity and interpret the result. QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge 2 Application 2 Knowledge Up to 2 marks for understanding of inelastic supply: • Price inelastic supply is where a change in price results in a less than proportionate change in quantity supplied (1) • Supply is not price sensitive (1) • Where PES is between 0 and 1 (1) • Supply cannot respond quickly to a change in price (1) • Diagram to show inelastic supply (1) The diagram is a coordinate system with a vertical axis labeled 'Price per house' and a horizontal axis labeled 'Quantity of houses'. The origin is marked with 'O'. A straight line, labeled 'S' at its upper end, starts from a point on the horizontal axis and slopes steeply upwards to the right, representing an inelastic supply curve. Application Up to 2 marks for application: • June 2018 to July 2020 the Government built 6 000 homes (1) • There is much paperwork needed to obtain planning permission (1) • Local authorities limit the land on which houses can be built (1) • There is a shortage of over 55 000 construction workers (1)	(4)

Question	<i>Ceteris paribus</i> , calculate the price elasticity of supply for cocoa. Show your working. Answer	Mark
10	Knowledge 1, Application 3 Quantitative skills assessed: QS8: Make calculations of elasticity and interpret the result. QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms Knowledge 1 mark for definition/the formula for price elasticity of supply $\frac{\% \text{ change in quantity supplied}}{\% \text{ change in price}} \quad (1)$ Application Up to 3 marks for calculations: - Change in quantity $5\,242\,000 - 4\,741\,000 = 501\,000$ Change in quantity $\div$ original quantity $\times 100$ $501\,000 \div 4\,741\,000 \times 100 = 10.57\% (10.5673908)$ (1) - Change in price $2\,770 - 2\,131 = 639$ Change in price $\div$ original price $\times 100$ $639 \div 2\,131 \times 100 = 29.99\% (29.9859221)$ (1) $\frac{\% \text{ change in quantity supplied}}{\% \text{ change in price}}$ $10.57 \div 29.99 = 0.35 \quad (1)$ NB: if correct answer (e.g. 0.35) is given, award full marks regardless of working. Accept reasonable rounding from full calculation Award 3 marks if percentage sign is added to the correct PES value	(4)

Question	With reference to Extract B, explain whether the supply of phosphate rock is likely to be price elastic or price inelastic. Answer	Mark
12 (b)	QS8: Make calculations of elasticity and interpret the result. QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge 2 Application 2 Knowledge 1 mark for identifying the correct price elasticity: • Supply is price inelastic (1) 1 mark for understanding price inelastic supply • A change in price results in a less than proportionate change in quantity supplied/ • The PES is between 0 and 1/ • Diagram showing inelastic supply/ • Cannot respond quickly/in the short run/difficult to respond to changes in price (1) Application Up to 2 marks for application: • 85% of the world supply comes from just five countries (1) • Morocco produces 70% of total production (1) • It is a finite resource/limited in supply (1)	(4)

Question	With reference to Figure 1 and Extract A, analyse one demand factor <i>and</i> one supply factor that caused the price of fertiliser to increase between January 2021 and April 2022. Illustrate your answer with a supply and demand diagram. Answer	Mark
12 (c)	Knowledge 2, Application 2, Analysis 2 Quantitative skills assessed: QS4: Construct and interpret a range of standard graphical forms QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge Up to 2 marks for the diagram showing: • Original supply, demand and equilibrium price and quantity (1) • New equilibrium price and quantity having correctly shifted both supply and demand (1) Analysis 1 mark for demand factor e.g.: • Demand for fertiliser increased by 6.3%/ • Governments paying subsidies to farmers during the global health crisis/ • Higher crop prices in 2021 provided an incentive for farmers to increase the quantity of crops that they grew (1) 1 mark for supply factor e.g.: • Poor weather caused some factories that manufacture fertiliser to shut down/ • Winter storms and Hurricane Ida disrupted production in the USA/ • Costs of production also rose as a result of a significant increase in the world price of gas (1) Application Up to 2 marks for diagram or reference to Figure 2.: • Shift demand to the right (1) • Shift supply to the left (1) • January 2021 price per tonne was just above \$400 increasing to approximately \$950 in April 2022 (1)	

Question	<i>Ceteris paribus</i> , calculate the price elasticity of supply for olive oil. Show your workings.	Mark
	Answer	
10	Knowledge 1, Application 3 Quantitative skills assessed: QS8: Make calculations of elasticity and interpret the result. QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms Knowledge 1 mark for definition/the formula price elasticity of supply $\frac{\% \text{ change in quantity supplied}}{\% \text{ change in price}} \quad (1)$ Application Up to 3 marks for calculations: - Change in quantity supplied $3.27 - 2.93 = 0.34$ Change in quantity $\div$ original quantity $\times 100$ $0.34 \div 2.93 \times 100 = 11.60\% \quad (1)$ - Change in price $5\,145 - 4\,125 = 1\,020$ Change in price $\div$ original price $\times 100$ $1020 \div 4\,125 \times 100 = 24.73\% \quad (1)$ $\frac{\% \text{ change in quantity supplied}}{\% \text{ change in price}}$ $\frac{11.60}{24.73} = 0.47 \quad (1)$ NB: if correct answer (e.g. 0.47, 0.469, 0.4690659) is given, award full marks regardless of working. Accept reasonable rounding from full calculation If 0.47% or -0.47 is given award 3 marks Where the proportions are calculated for the change in quantity supplied or price award 1 mark for each (e.g. 0.116 and 0.2473)	(4)

Question	<i>Ceteris paribus</i>, explain the likely impact of this change in production costs on producer surplus in the electric vehicle market. Illustrate your answer with a supply and demand diagram Answer	Mark
11	Knowledge 1, Application 1, Analysis 2 Quantitative skills assessed: QS4: Construct and interpret a range of standard graphical forms QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge 1 mark for definition of producer surplus e.g.: The difference between the market price and the price at which the suppliers are willing to sell/the cost of supply (1) Application 1 mark for correct shift of supply to the right (1)  Analysis Up to 2 marks for showing the change in producer surplus Old producer surplus FGP_e (1) New producer surplus HJP_1 (1) Producer surplus increases (1)	(4)

Question	With reference to Extract B, explain whether the supply of nuclear reactors is price elastic or price inelastic. Answer	Mark
12 (c)	QS8: Make calculations of elasticity and interpret the result. QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge 2 Application 2 Knowledge Up to 2 marks for any two of the following: Formula or definition of price elasticity of supply e.g. - The responsiveness of quantity supplied to a change in price (1) Understanding of price elastic supply, e.g. - Elastic: A value above 1/ a larger than proportional change in quantity supplied to a change in price (1) Understanding of price inelastic supply, e.g. - Inelastic: A value between 0 and 1/ a smaller than proportional change in quantity supplied to a change in price (1) Application 1 mark for application explicitly to Extract B: - It took on average 7.5 years to construct each nuclear reactor / - One reactor in Argentina took 33 years to construct (1) 1 mark for identifying the price elasticity of supply for nuclear reactors - price inelastic supply (1)	(4)

Question	With reference to Extract C, examine two microeconomic effects of the introduction of an indirect tax on the production of coal. Answer	Mark
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Question	With reference to Figure 2, explain the term 'price inelastic supply'. Refer to the short-run and the long-run in your answer. Answer	Mark
12 (c)	QS8: Make calculations of elasticity and interpret the result. QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge 2 Application 2 Knowledge 1 mark for understanding of price inelastic supply: - where the PES is between 0 and 1/a change in price causes a less than proportionate change in quantity supplied (1) 1 mark for understanding PES in the short-run and the long-run: - More inelastic in the short-run/less inelastic in the long-run/ becomes more elastic over time/ inelastic in both the short-run and long-run (1) Application Up to 2 marks for application: - Short-run PES +0.07 (1) - Long-run PES +0.57 (1)	(4)

Question	<i>Ceteris paribus</i> , calculate the price elasticity of supply for green coffee beans. Show your workings.	Mark
	Answer	
10	Knowledge 1, Application 3 Quantitative skills assessed: QS8: Make calculations of elasticity and interpret the result. QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms Knowledge 1 mark for definition/the formula of price elasticity of supply $\frac{\% \text{ change in quantity supplied}}{\% \text{ change in price}} \quad (1)$ Application Up to 3 marks for calculations: • % change in green coffee bean output $11\,550\,000 - 8\,510\,000 / 8\,510\,000 \times 100 = 35.7226792\% \quad (1)$ • % change in price $1.82 - 1.61 / 1.61 \times 100 = 13.0434783\% \quad (1)$ $35.7226792\% \div 13.0434783\% = 2.73873873 \quad (1)$ NB: if correct answer (e.g. 2.7/ 2.74/2.739) is given, award full marks regardless of working. Accept reasonable rounding from full calculation (e.g. 36/13 = 2.8) Award 3 marks for 2.74%	(4)

Question	With reference to Extract B, explain the difference between price inelastic supply and price elastic supply. Answer	Mark
12 (c)	QS8: Make calculations of elasticity and interpret the result. QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge 2 Application 2 Knowledge 1 mark for understanding of price inelastic supply: - where the PES is between 0 and 1/a change in price causes a less than proportionate change in quantity supplied/diagram showing inelastic supply (1) 1 mark for understanding of price elastic supply: - where the PES is between 1 and infinity/a change in price causes a more than proportionate change in quantity supplied/diagram to show elastic supply (1) Application Up to 2 marks for application: - It will take 12-16 months to build one new container ship/ the shipping companies will have an even longer wait before the ships are received suggests inelastic (1) - Only 65% of capacity on container ships is typically used suggesting that supply is elastic (1)	(4)

Question Number	Answer	Mark
12 (d)	Knowledge 2, Application 2, Analysis 2, Evaluation 2 QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms Knowledge Up to 2 marks for knowledge of PES, e.g.: • Definition of price elasticity of supply: responsiveness of quantity supplied to a change in price (1) • Price elastic supply- value of PES greater than 1/ where there is a more than proportionate change in supply in response to a change in price/ Diagram illustrating elastic supply (1) • Price inelastic supply- value of PES between 0 and 1/ where there is a less than proportionate change in supply in response to a change in price/ Diagram illustrating inelastic supply (1) Application and analysis Up to 2 marks for each reference to the given sources and linked explanations with a maximum of 4 marks e.g.: • With the stockpile any increase in price can be responded to with the release from the stockpile suggesting elastic supply (1+1) • Harvesting only twice a year suggests that when price rises there could be a delay before harvesting takes place, suggesting supply is inelastic (1+1) • Harvesting more than once a year suggests that suppliers can respond quickly to changes in price, suggesting supply is more elastic (1+1) • It can take 30 months from planting a tree for it to produce fruits suggesting a long delay and inelastic supply (1+1) • Only limited number of countries produce palm oil so when price raises only limited number of countries can increase supply meaning inelastic (1+1) Candidates may present an argument for elastic or inelastic for KAA and be rewarded for the alternative as Evaluation. Evaluation Up to 2 marks for evaluative comments, e.g.: • The supply will be relatively inelastic in the short run and become more elastic in the long run as factors become variable (1+1)	(8)

	• The size of the price change will be important in determining how much supply will respond/ the larger change of price at -25.94% suggests a greater influence on supply (1+1) • Factors such as the weather can have a significant impact on the ability to respond with supply (1+1) • New technologies could help increase production enabling supply to respond better (1+1)	
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Question Number	Indicative content
14	Indicative content guidance Answers must be credited by using the level descriptors (below) in line with the general marking guidance. The indicative content below exemplifies some of the points that candidates may make but this does not imply that any of these must be included. Other relevant points must also be credited. Quantitative skills assessed QS2: Calculate, use and understand percentages, percentage changes and percentage points changes. QS8: Make calculations of elasticity and interpret the result. QS9: Interpret, apply and analyse information in written, graphical, tabular and numerical forms. Knowledge, application and analysis (12 marks) – indicative content • Define PES - responsiveness of quantity supplied to a change in price • $\\$1\,481 - \\$1\,275 = \\$206$ • $206 \div 1\,275 \times 100 = 16.2\%$ • $889.5 - 888.8 = 0.7$ tonnes • $0.7 \div 888.8 \times 100 = 0.079\%$ • $0.079 \div 16.2 = 0.0048$ • Price inelastic supply - a value between 0 and 1/where the quantity supplied is less responsive to a change in price • Price has risen by 16.2% but the quantity supplied increased by just 0.079% • The time period it takes to set up a mine is long so it will take time to increase the quantity mined • Mobility of factors of production - if output is to be increased more skilled labour is needed - it may take time to train new workers to work in the mines/Capital required to work on new mines will take time to acquire • Legal constraints - it will take time to get planning permission to set up a mine which will delay the time before output could be delayed • Capacity - if the mines are working at full capacity they would find it difficult to respond to higher prices by increasing the amount of gold mined • Ten countries supply 62% of output suggesting relatively few countries supplying gold • Limited number of countries where gold is mined limits the ability for supply to respond

		- There is a finite quantity of gold so there are limits to the how much can be found - There are high start-up costs associated with starting a mine that limit the ability for new firms to start mining for gold - The future global price of gold is uncertain, prices can be volatile meaning fewer firms will be willing to invest in mining gold
Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	Displays isolated, superficial or imprecise knowledge and understanding of economic terms, principles, concepts, theories and models. Use of generic material or irrelevant information or inappropriate examples. Descriptive approach, which has no chains of reasoning.
Level 2	4–6	Displays elements of knowledge and understanding of economic terms, principles, concepts, theories and models. Limited application of knowledge and understanding to economic problems in context. A narrow response or superficial, only two-stage chains of reasoning in terms of cause and/or consequence.
Level 3	7–9	Demonstrates accurate knowledge and understanding of economic terms, principles, concepts, theories and models. Ability to apply knowledge and understanding to some elements of the question. Some evidence and contextual references are evident in the answer. Analysis is clear and coherent. Chains of reasoning in terms of cause and/or consequence are evident but they may not be developed fully or some stages are omitted.
Level 4	10–12	Demonstrates accurate and precise knowledge and understanding of economic terms, principles, concepts, theories and models. Ability to link knowledge and understanding in context using appropriate examples which are fully integrated to address the broad elements of the question. Analysis is clear, coherent, relevant and focused. The answer demonstrates logical and multi-stage chains of reasoning in terms of cause and/or consequence.

	Evaluation (8 marks) – indicative content • Magnitude – this is a significant rise in the price of gold which may with a delay cause output to rise • Time frame – over time PES tends to become more elastic as number of mines and capacity of mines can be adjusted/in the short run only one factor of production adjusted making PES more inelastic • We do not know how much the output or price varies across other years • The weather could cause flooding impacting the ability to adjust output in a particular year • Availability of stocks - gold can be stored which would suggest that it might in fact be more elastic • Significance of determinants of PES • New technology may improve the ability for supply to respond	
Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	Identification of generic evaluative comments. No supporting evidence/reference to context. No evidence of a logical chain of reasoning.
Level 2	4–6	Evidence of evaluation of alternative approaches. Some supporting evidence/reference to context. Evaluation is supported by a partially-developed chain of reasoning.
Level 3	7–8	Evaluation recognises different viewpoints and/or is critical of the evidence, leading to an informed judgement. Appropriate reference to evidence/context. Evaluation is supported by a logical chain of reasoning.