Please check the examination details below before entering your candidate information

Candidate surname	Other names
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Pearson Edexcel Level 3 GCE

Centre Number	Candidate Number

Time 1 hour 30 minutes

Paper reference **8EC0/01**

Economics A

Advanced Subsidiary

PAPER 1: Introduction to Markets and Market Failure

You do not need any other materials.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- There are two sections in this question paper.
- Answer **all** questions in Section A.
- In Section B, answer **all** of questions 6(a) to 6(e) and **one** question from 6(f) or 6(g).
- Answer the questions in the spaces provided
  – *there may be more space than you need.*

Information

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

Advice

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

Turn over ▶

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SECTION A

Answer ALL questions. Write your answers in the spaces provided.

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

You are advised to spend 25 minutes on this section.

Use the data to support your answers where relevant. You may annotate and include diagrams in your answers.

1 Since 2015, the government has invested £74 million on a flood defence scheme in the Calder Valley. The scheme will protect homes, businesses and jobs.

(Source: https://www.theguardian.com/uk-news/2020/feb/10/yorkshire-residents-criticise-delays-to-flood-defence-scheme)

(a) What are the characteristics of a private good?

(1)

- ☐ **A** Non-rivalrous and excludable
- ☐ **B** Non-rivalrous and non-excludable
- ☒ **C** Rivalrous and excludable
- ☐ **D** Rivalrous and non-excludable

(b) Explain why flood defences such as those in the Calder Valley are usually provided by the public sector.

(3)

Flood defences are a public good because they are non-excludable and non-rivalrous. Once the £74 million scheme in the Calder Valley is built, it is impossible to stop any home or business in the area from benefiting from the protection, even if they have not paid, and one household being protected does not reduce the protection available to others. This creates the free rider problem: individuals may refuse to pay but still benefit, so private firms could not raise enough revenue to build the flood defences and the free market would fail to provide them at all (a missing market). The public sector therefore provides them, funded by taxation, which is more effective, as the government has done by investing £74m in the Calder Valley.

(Total for Question 1 = 4 marks)

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2 The Common Agricultural Policy (CAP) is a system of minimum prices and other programmes covering farming, environmental measures and rural development. The CAP applied to British farmers before the UK left the EU in January 2020.

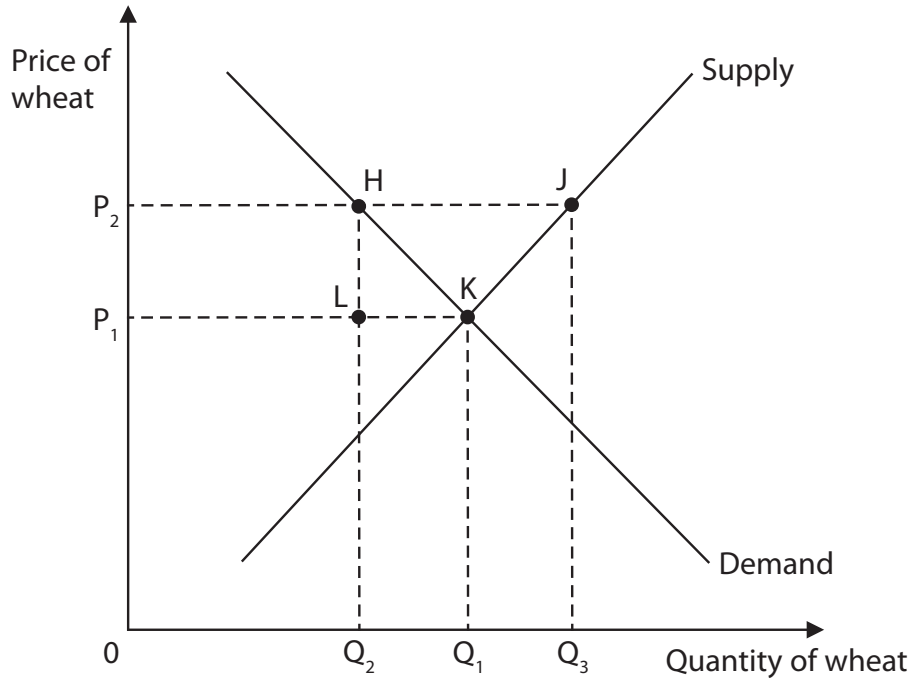
(Source adapted from: https://www.gov.uk/government/collections/common-agricultural-policy-reform)

(a) Define the term 'minimum price'.

(1)

A minimum price is a price floor set by the government (usually above the free market equilibrium price), below which the good cannot legally be sold.

The diagram below shows the demand and supply curves for wheat in the European Union (EU).



The free market price of wheat is P_1. It had been agreed as part of the CAP to maintain a price of P_2 within the EU and to do so through intervention buying.

(b) In achieving a price of P_2, the amount spent on intervention buying by the EU would be

(1)

- ☐ **A** HKL
- ☒ **B** JHQ_2Q_3
- ☐ **C** LKJH
- ☐ **D** Q_1Q_2LK

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(c) Explain **one** likely problem for the EU of maintaining prices at P_2.

(2)

At P2 there is a surplus (excess supply) of wheat equal to Q3 – Q2, because farmers are encouraged to supply Q3 but consumers only demand Q2.

The EU must buy up this surplus through intervention buying (area JHQ2Q3) and then store it. This is expensive: storage facilities cost money to maintain and the wheat may deteriorate or be wasted, and the cost has to be paid for through higher taxes. There is also an opportunity cost, as this money could have been spent on other services such as education or healthcare.

(Total for Question 2 = 4 marks)

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3 The world's first cryptocurrency, Bitcoin is stored and exchanged securely on the internet through a digital ledger known as a blockchain. Bitcoins are divisible into smaller units known as satoshis.

(Source: https://www.coinbase.com/price/bitcoin)

(a) Which **one** of the following would be most likely to cause a country's currency to no longer be acceptable as a medium of exchange?

(1)

- ☐ **A** It becomes harder to counterfeit
- ☒ **B** It becomes unlimited in supply
- ☐ **C** It is issued in smaller denominations
- ☐ **D** It is more long lasting

(b) Explain how Bitcoin fulfils **one** function of money, apart from as a medium of exchange.

(3)

Bitcoin fulfils the function of a store of value. This means that money can be saved and used to buy goods and services in the future, keeping its value over time.

When an individual saves bitcoin, it is held securely on the internet in the digital ledger (the blockchain), so it cannot easily be counterfeited, lost or stolen. The individual can be confident that they will receive the equivalent value back when they come to spend it.

Bitcoin also has a limited supply, so its value is not reduced by the issue of extra units, and because it is divisible into satoshis even small amounts of savings can be stored.

(However, its usefulness as a store of value is limited if its price is very volatile.)

(Total for Question 3 = 4 marks)

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4 A large number of people should be vaccinated against a new virus, so that even those who are not vaccinated will benefit.

(a) With reference to the statement above, explain the difference between positive and normative statements.

(3)

A positive statement is objective and value free: it is based on facts and can be tested and verified with evidence. A normative statement is subjective and contains a value judgement about what ought to happen, so it cannot be proven right or wrong with evidence.

The first part of the statement, 'a large number of people should be vaccinated', is normative, because the word 'should' shows that it is a person's value judgement that vaccination is good for the whole population.

The second part, 'even those who are not vaccinated will benefit', is a positive statement, because evidence can be collected to test it: data shows that if enough members of a population are vaccinated, even those who are not vaccinated receive a measure of protection (herd immunity).

(b) Which **one** of the following explains how market failure might occur in a free market economy?

(1)

- ☐ **A** A net welfare loss results from intervention by the government
- ☐ **B** Firms enter the market in response to higher prices
- ☒ **C** Goods with positive externalities are underprovided
- ☐ **D** Prices rise when there is excess demand

(Total for Question 4 = 4 marks)

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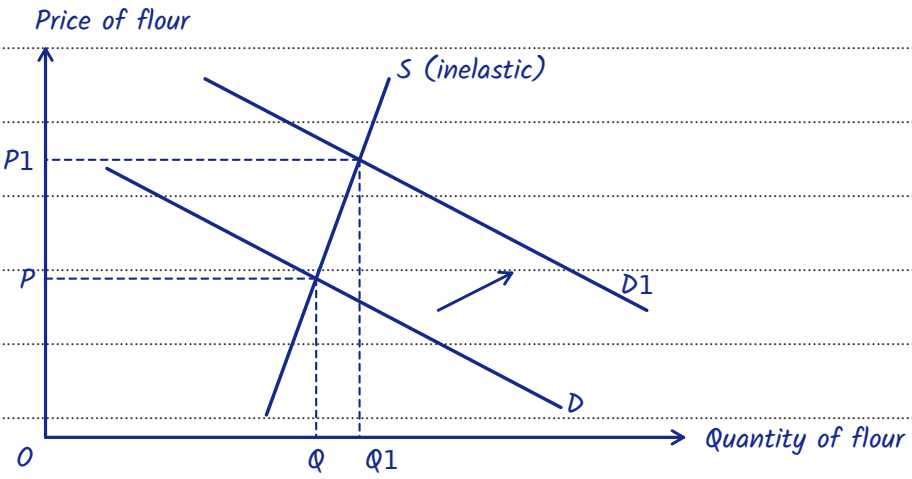
5 In March 2020, a substantial increase in the demand for flour resulted in the retail price of flour increasing. Despite the price rises, the supply of flour failed to keep up with the increased demand.

(a) Explain **one** reason why flour producers might find it difficult to increase quantity supplied in the short run.

(3)

Supply of flour is likely to be price inelastic in the short run (PES less than 1) because it takes time for firms to respond to a price rise. Flour is made from wheat, which takes months to grow and is harvested only once a year, and it is difficult to store large stocks of wheat because it is bulky and perishable. Mills may also be at full capacity, so producers cannot process the wheat into flour quickly enough.

So the large rise in demand in March 2020 caused a large rise in price (P to P1) but only a small rise in quantity supplied (Q to Q1): a 20% price rise might raise supply by only 5% (PES = 0.25).



(b) A manufacturer has estimated that the price elasticity of supply of ice cream is +1.5. If the demand for ice cream rises and the price increases by 10%, which **one** of the following is the resulting percentage change in supply?

(1)

- ☐ **A** 0.15%
- ☐ **B** 1.5%
- ☐ **C** 6.67%
- ☒ **D** 15%

(Total for Question 5 = 4 marks)

TOTAL FOR SECTION A = 20 MARKS

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SECTION B

Read Extracts A and B and Figure 1 before answering Question 6.

Answer ALL Questions 6(a) to 6(e) and EITHER Question 6(f) OR Question 6(g).

You are advised to spend 1 hour and 5 minutes on this section.

Question 6

The market for fish

Extract A

Total allowable catches of North Sea cod halved in response to falling stocks

In 2020, new lower limits on the quantity of cod that can be caught by the UK fishing fleet came into force. These limits on the fish catch, called total allowable catches (TACs), were agreed at the annual EU fisheries negotiations.

It was the last December EU meeting attended by the UK before it left the EU. It was agreed that cod catch limits will be cut by 50% in the North Sea, while reduced limits were agreed for cod in the Celtic Sea, Irish Sea and west of Scotland.

However, there were increases for other types of fish, with TACs for haddock in the North Sea rising by 23% and for sole rising by 19%.

UK Fisheries Minister George Eustice said: "This year there has been mounting scientific evidence suggesting that cod is being overfished in many parts of the northeast Atlantic and we have responded to conserve stocks".

These new regulations applied to the UK while it remained part of the Common Fisheries Policy. In the future it will become an independent coastal state and negotiate on fisheries with the EU and other coastal states such as Norway.

(Source adapted from: https://www.independent.co.uk/news/business/news/north-sea-cod-stocks-quota-climate-change-brexit-a9252196.html)

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Figure 1

Atlantic over-fishing: share of total allowable catch (TAC) in excess of scientific advice (2019)

Country	**Excess TAC** (%)	**Excess TAC** (tonnes)
Sweden	52.4	17 369
United Kingdom	24.3	106 925
Ireland	21.7	34 052
Denmark	19.7	49 914
Germany	18.0	20 620
The Netherlands	13.5	31 910
Belgium	10.4	3 009
France	9.4	27 230
Spain	6.6	16 689
Portugal	3.8	3 662

(Source adapted from: Statista 2018)

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Extract B

The tragedy of the commons

The 'tragedy of the commons' may occur when there are common access resources (CARs). These are natural resources over which no private ownership has been established. Therefore, there are difficulties in excluding people from using or exploiting them. CARs include fisheries and common grazing lands. Oceans are so vast that it is impractical for one fishing company to establish ownership and control. This means that others cannot be prevented from exploiting the ocean. Economists have suggested that with the lack of ownership of these resources, private producers will act in their own self-interest and exploit CARs to maximise profit. This exploitation is unsustainable. In other words, CARs provide an opportunity for individuals to create profit, while creating negative externalities which impact on everybody else. This process is referred to as the 'tragedy of the commons'.

The 'tragedy of the commons' is at the core of a range of problems that are relevant and threatening to natural resources, environments and human health. In the case of overfishing, fishing companies are not made accountable for the state of the ocean. They continue to fish as much as possible to maximise profit. Today, 90% of fish stocks are depleted.

The reason for such a wide range of problems is because there is an environmental cost for everything. The 'tragedy of the commons' is the outcome of the fact that every resource is limited on this planet, coupled with the rising level of demand for these resources. These issues are large-scale and require laws, regulation and international cooperation.

(Source adapted from: http://felixonline.co.uk/articles/2019-12-09-tragedy-commons-drama-planet-not-enjoying/)

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6 (a) Explain the likely impact of the new 2020 TACs on the price of cod. Include a supply and demand diagram in your answer.

(5)

According to Extract B, lines 15–16, 'fishing companies are not made accountable for the state of the ocean. They continue to fish as much as possible to maximise profit'.

(b) Assess whether it is rational for fishing companies to behave in this way.

(10)

(c) With reference to the information provided and your own knowledge, explain **two** characteristics of private ownership in a free market economy.

(6)

Fish and chips are complementary goods with an estimated cross elasticity of demand of –8. Currently 950 000 bags of chips are sold in UK fish and chip shops each day.

(d) With reference to the information provided, calculate the new quantity demanded of bags of chips from fish and chip shops, following a 2% increase in the price of fish. You are advised to show your working.

(4)

The UK fishing industry employs about 24 000 people, more than half of them working in Scotland.

(e) Discuss the likely impacts on an economy of specialising in the fishing industry. Use a production possibility frontier diagram in your answer.

(15)

EITHER

(f) Some economists suggest that the market price of cod does not result in the socially optimum level of output. Evaluate the likely external costs from the over-fishing of cod. Use an appropriate diagram in your answer.

(20)

OR

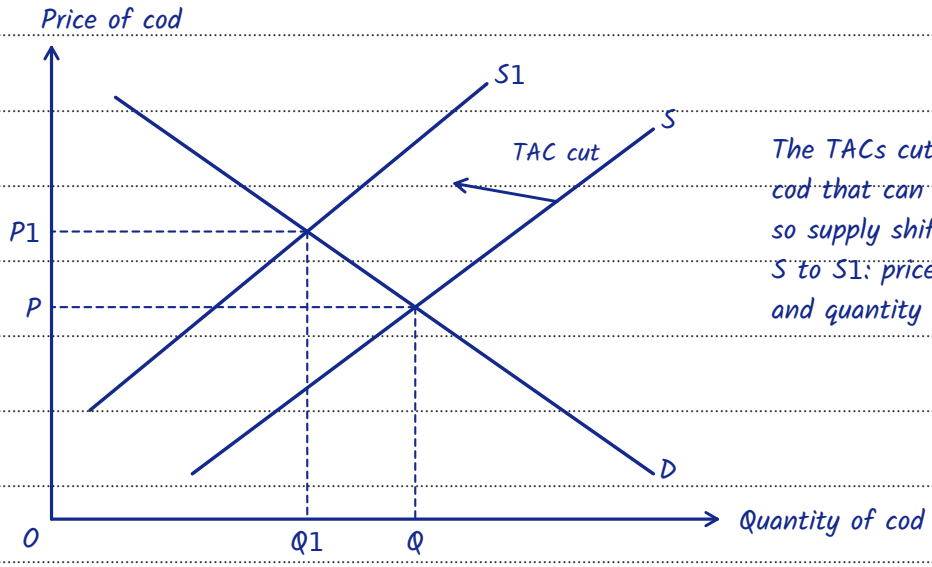
(g) Other than using a TAC, evaluate the policy options which could be used to reduce market failure resulting from over-fishing. Use at least one appropriate diagram in your answer.

(20)

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6 (a) Explain the likely impact of the new 2020 TACs on the price of cod. Include a supply and demand diagram in your answer.

(5)



The TACs cut the quantity of cod that can legally be caught, so supply shifts left from S to S1: price rises P to P1 and quantity falls Q to Q1.

Total allowable catches (TACs) limit the quantity of cod that the UK fishing fleet can legally catch. In 2020 cod catch limits were cut by 50% in the North Sea, and reduced limits were also agreed for cod in the Celtic Sea, Irish Sea and west of Scotland. This reduces the supply of cod, so in my diagram the supply curve shifts to the left from S to S1.

At the original price P there is now excess demand for cod, so the price is bid up from P to P1 and the quantity traded falls from Q to Q1, until a new equilibrium is reached.

The price rise is likely to be large. Figure 1 shows that the UK's TAC in 2019 was 24.3% (106 925 tonnes) above scientific advice, the largest excess in tonnes of any country, so bringing catches into line needs a big cut in supply. Demand for cod is also likely to be price inelastic as it is a traditional choice in fish and chips, although the 23% rise in the TAC for haddock, a substitute, may limit the rise in the price of cod.

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According to Extract B, lines 15–16, 'fishing companies are not made accountable for the state of the ocean. They continue to fish as much as possible to maximise profit'.

(b) Assess whether it is rational for fishing companies to behave in this way.

(10)

Rational behaviour in economics assumes that economic agents act in their own self-interest to maximise their utility; for firms this means profit maximisation. From the perspective of an individual fishing company it is completely rational to fish as much as possible. A firm's revenues are clearly linked to the size of its catch, so every extra tonne of fish caught adds to total revenue. Because the ocean is a common access resource, no one owns the fish stock and the firm cannot be excluded from using it, so it does not pay for the fish it takes. As Extract B says, 'private producers will act in their own self-interest and exploit common access resources to maximise profit'.

In addition, if one firm limits its catch to conserve stocks, other firms will simply catch those fish instead, so restraint brings it no benefit. Figure 1 shows that even the agreed catches exceed scientific advice, with Sweden fishing 52.4% in excess of the advised level, suggesting every nation and firm is trying to secure as large a share as possible. Using techniques to increase the size of the catch also helps to minimise costs, because fixed costs such as boats and crews are spread over more output, lowering average costs and raising profit. Meanwhile the negative externalities created are spread across everyone else and do not appear in the firm's private costs: common access resources 'provide an opportunity for individuals to create profit, while creating negative externalities which impact on everybody else'.

However, this behaviour may be irrational in the long run. The exploitation is unsustainable and leads to the depletion of the resource, which is known as the tragedy of the commons. Extract B states that '90% of fish stocks are depleted'. Short run profits mean that stocks are rapidly depleted, so in the long run individual firms find that dwindling fish stocks mean their own revenue base is contracting; each trip catches fewer fish, the

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cost per tonne rises and eventually there may be no resources left for them to fish, forcing firms out of business. The 50% cut in the North Sea cod TAC shows the consequence: firms now face much tighter legal limits that reduce their revenue far more than if they had fished sustainably.

Furthermore, while it may be rational for firms to behave this way, it is harmful to society, of which those firms and their workers are a part, as the negative externalities, such as damage to marine ecosystems, impact society as a whole. Firms may also lack full information about the state of the stock, so their decisions may reflect bounded rationality and short-termism rather than a careful long-term calculation.

Overall, fishing as much as possible is rational in the short run for a single profit-maximising firm, since the ocean is a common access resource and others cannot be excluded. However, it is irrational in the long run and for the industry as a whole because it destroys the stocks on which future profits depend. Whether it is rational therefore depends on the time horizon firms use and on whether regulations such as TACs are enforced.

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(c) With reference to the information provided and your own knowledge, explain **two** characteristics of private ownership in a free market economy.

(6)

One characteristic of private ownership is excludability, based on clearly defined property rights. If an individual or firm privately owns a resource, they can legally stop other people from using it, and so they can charge for the use of the asset. Private ownership of a resource also means someone is accountable for it. Extract B explains that oceans are so vast that it is impractical for one fishing company to establish ownership and control, so others cannot be prevented from exploiting them. If a fish stock were privately owned, the owner would have an incentive to protect it in order to maintain its future value.

A second characteristic is that resources are used in the self-interest of their owners to generate profit. In a free market economy the factors of production, land, labour, capital and enterprise, are privately owned and may be exploited by private individuals or firms, who choose to buy and sell resources through the price mechanism in order to make a profit. As Extract B says, 'private producers will act in their own self-interest' and aim to 'maximise profit'. This gives an incentive to be efficient and to innovate, but private ownership may also lead to wage disparities and other inequalities of income and wealth, as those who own more resources earn higher incomes.

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Fish and chips are complementary goods with an estimated cross elasticity of demand of –8. Currently 950 000 bags of chips are sold in UK fish and chip shops each day.

(d) With reference to the information provided, calculate the new quantity demanded of bags of chips from fish and chip shops, following a 2% increase in the price of fish. You are advised to show your working.

(4)

XED = %ΔQD of chips ÷ %ΔP of fish

−8 = %ΔQD of chips ÷ 2%

%ΔQD of chips = −8 × 2% = −16% (a decrease in the quantity demanded of bags of chips, as they are complements)

Fall in quantity demanded = 950 000 × 16% = 152 000 bags

New quantity demanded = 950 000 − 152 000

= 798 000 bags of chips per day

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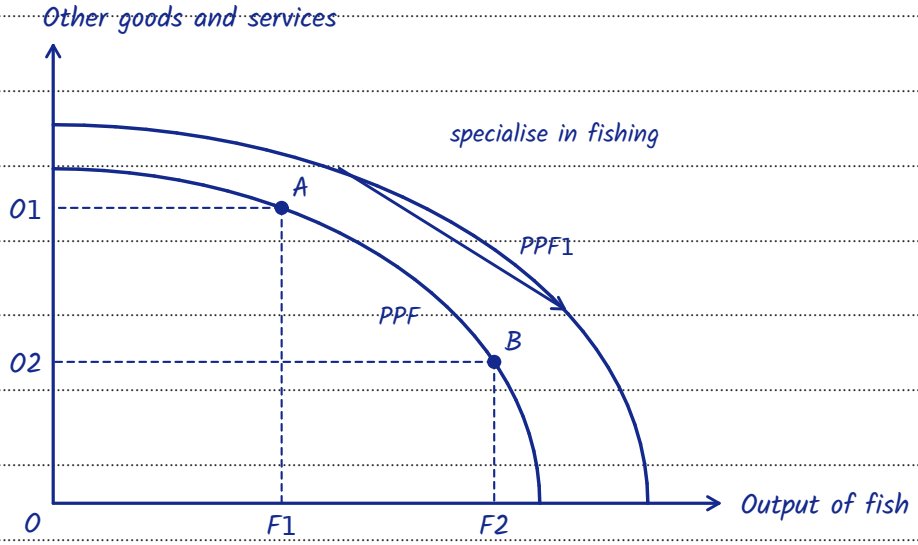
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The UK fishing industry employs about 24 000 people, more than half of them working in Scotland.

(e) Discuss the likely impacts on an economy of specialising in the fishing industry. Use a production possibility frontier diagram in your answer.

(15)

Specialisation is when an individual, firm, region or country concentrates on producing a limited range of goods or services, such as Scotland concentrating on fishing, where more than half of the UK's 24 000 fishing workers are employed.



In my PPF diagram, specialising in fishing moves the economy along its PPF from A to B; more resources, such as workers, boats and port facilities, are allocated to fishing, so the output of fish rises from F1 to F2. The opportunity cost is the fall in the output of other goods and services from O1 to O2, as the number of people working in fishing related industries rises relative to those working in non-fishing industries. Over time, the efficiency gains from specialisation can shift the PPF outwards to PPF1.

There are several advantages. Fishing fleets develop expertise based on years of experience, and this is the case for both labour and capital, as boats and equipment are designed specifically for the local fishing grounds. Division of labour increases productivity and reduces the costs of production. Fishing ports already have the infrastructure to process the catch and distribute it to markets in the UK and overseas, and there are spillover

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effects: skilled labour is more freely available, so if a firm needs a new worker it can hire someone already trained by a different company. Training providers can also specialise in developing skills for the fishing industry without having to invest in training in other areas. Specialisation is also an efficient use of resources, since a region such as Scotland that specialises in fishing does so because it has good fishing grounds. It creates jobs, as the people of Scotland can find employment in the industry, and these opportunities will grow as the industry develops. By catching more fish than it needs, the economy can sell and export the surplus and trade with other countries that specialise in producing other goods. This increases income in the Scottish economy and, through lower costs and higher output, can improve living standards.

However, there are significant disadvantages. An economy that specialises in fishing becomes over-exposed to one industry. If the resource is over-exploited, firms may fail, leading to job losses. The 50% reduction in the North Sea cod TAC could lead to major issues for Scottish fishing, cutting the incomes of fishing communities and of the ports and processing firms that depend on them. With 90% of fish stocks depleted (Extract B), current levels of consumption may be unsustainable, reducing incomes for future generations.

Demand could also fall, for example with the increasing trend towards vegetarianism and veganism, leaving the economy at risk. Workers could find it difficult to transfer to other industries if they are over-specialised, because their skills are not easily transferable (occupational immobility), causing structural unemployment in coastal towns where there are few alternative jobs. There may also be external costs related to congestion and pollution around busy fishing ports.

The size of the impact depends on the scale of specialisation. The 24 000 people employed in fishing are a very small share of the UK workforce of over 30 million, so the impact on the UK economy as a whole is small, but the impact on particular coastal communities in

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Scotland is much larger as they are heavily dependent on fishing. It also depends on future access to fish: as an independent coastal state outside the EU, the UK may be able to negotiate a larger share of catches, which would increase the benefits of specialisation. Overall, specialising in fishing brings benefits of expertise, lower costs, jobs and trade, but the risks are high because the industry depends on a limited natural resource and changing regulation. The economy benefits most if fishing is sustainable and the region also develops other industries, so it is not over-dependent on one sector.

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(f) Some economists suggest that the market price of cod does not result in the socially optimum level of output. Evaluate the likely external costs from the over-fishing of cod. Use an appropriate diagram in your answer.

(20)

OR

(g) Other than using a TAC, evaluate the policy options which could be used to reduce market failure resulting from over-fishing. Use at least one appropriate diagram in your answer.

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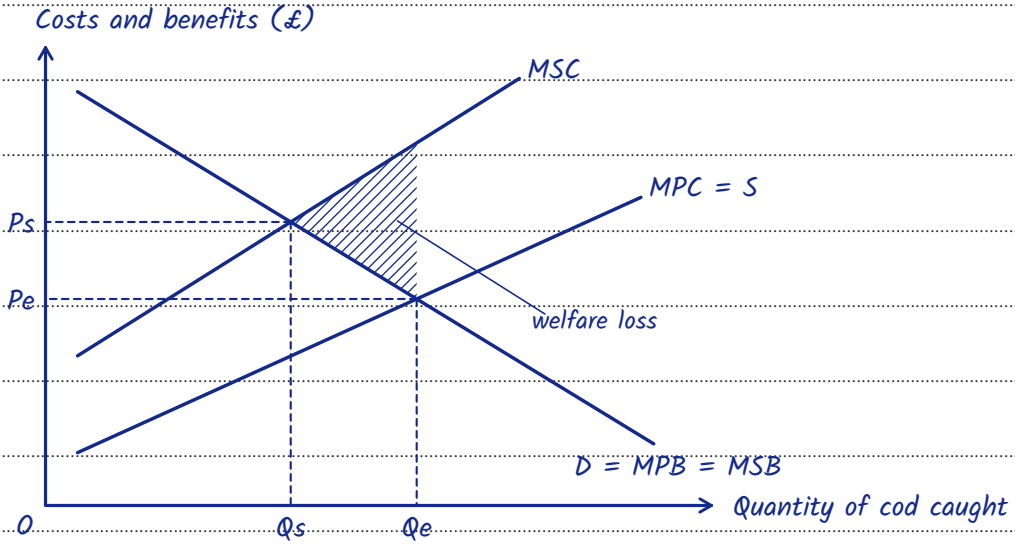
Indicate which question you are answering by marking a cross in the box ☒. If you change your mind, put a line through the box ☒ and then indicate your new question with a cross ☒.

Chosen question number: **Question 6(f)** ☒ **Question 6(g)** ☒

Write your answer here:

Answer to 6(f):

An external cost is a cost borne by third parties who are not involved in a transaction, which is not reflected in the market price. Over-fishing of cod is a negative externality in production: marginal social cost (MSC) = marginal private cost (MPC) + external cost.



In my diagram, fishing firms only take into account their private costs (MPC), such as fuel, wages and boats, so the market equilibrium is where MPC = MPB, at quantity Qe and price Pe. However, the marginal social cost is higher at MSC because of the external costs. The socially optimum level of output is where MSC = MSB, at Qs and a higher

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price Ps. The market therefore over-produces: cod is over-fished by Qe – Qs and the market price is too low as it does not include the external costs. The shaded triangle shows the welfare loss to society, so there is market failure and a misallocation of resources.

The most important external cost is the depletion of fish stocks for future generations. Extract B states that '90% of fish stocks are depleted', the tragedy of the commons. Figure 1 shows the scale of the over-fishing: Sweden's TAC is 52.4% above what scientists advise and the UK's is 24.3% (106 925 tonnes) above advice. As stocks fall, future fishermen, processors and consumers lose out through lost jobs, lower incomes and higher prices, which is why the North Sea cod TAC had to be cut by 50%.

Second, over-fishing damages the marine environment. Fishing nets catch and kill dolphins, seals and seabirds, costing wildlife charities money to rescue and rehabilitate animals, and lost nets keep trapping wildlife for years. The fishing industry throws any over-catch back into the sea, which can pollute the water and disrupt the food chain.

Third, fishing boats can spill oil and fuel, which has a negative impact on those swimming in the sea, on tourism and on wildlife, and creates clean-up costs for the Environment Agency, paid for by taxpayers. The smell, noise and congestion from the fishing industry also have a negative impact on people who live near the ports. In addition, over-fishing increases supply and lowers the price of fish, which harms producers of other food items.

However, it is hard to put a value on external costs: how do you value harm to wildlife or to future generations? This means the size of the gap between MSC and MPC is uncertain, and some impacts, such as the collapse of a stock, are slow to emerge, so they may be under- or over-estimated.

There may also be external benefits that offset some of the costs, such as jobs created in fish processing plants and in the boat building and net making industries, which support coastal communities.

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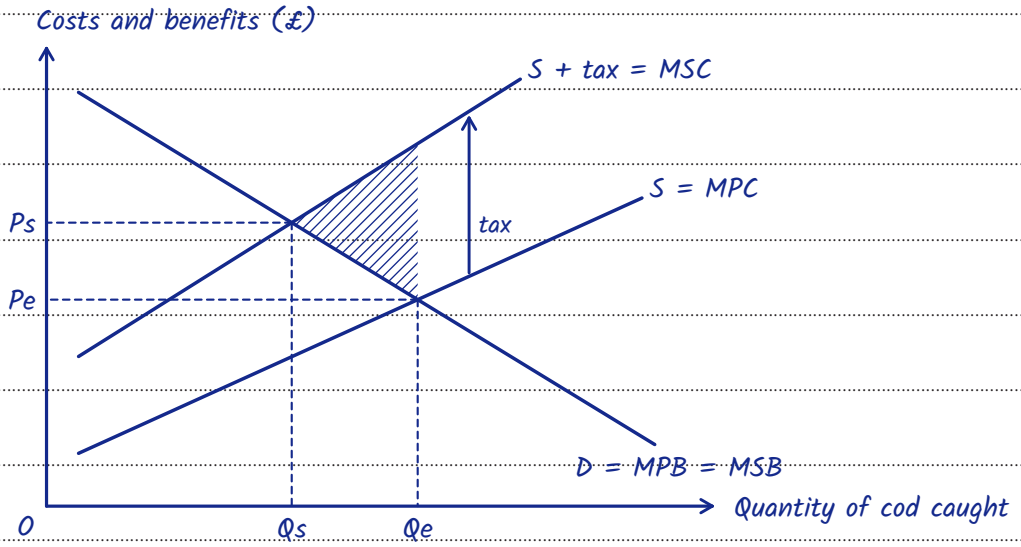
Moreover, the external costs may be falling. Technology improves, so the risk of oil spills is reducing, net manufacturers are developing safer nets, and the fishing industry is more aware of the need to dispose of nets appropriately. New methods of fishing are reducing bycatch. TACs have also helped to reduce the external costs: the 2020 cuts to cod catches should allow stocks to recover, and the 23% rise in the haddock TAC suggests some stocks are already recovering. The scale also differs by country, as Portugal's TAC is only 3.8% above advice.

Overall, the external costs of over-fishing cod are likely to be significant, and the largest is the long-term depletion of stocks, since this threatens the whole industry and the marine ecosystem, whereas costs such as pollution are smaller and are being reduced by technology. The final size of the external costs depends on how well TACs are enforced and on international cooperation, which the UK must now negotiate as an independent coastal state.

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Answer to 6(g):

Over-fishing is market failure because fishing firms ignore the external costs of depleting a common access resource, so too much fish is caught (Qe rather than the social optimum Qs). Several policies other than TACs could reduce this.



First, the government could impose an indirect tax on fish, equal to the external cost. In my diagram the tax shifts supply from S = MPC to S + tax = MSC, so the external cost is internalised: price rises from Pe to Ps and quantity falls from Qe to the socially optimum level Qs, removing the welfare loss. It also raises tax revenue that could fund marine conservation. However, the government faces an information gap: it is difficult to value the external cost, so it may not know the right level of tax. If demand for fish is price inelastic, quantity falls only slightly, and the tax is regressive, hitting low income households hardest.

Second, the government could use regulation, such as designated areas where fishing is banned (marine protected areas) allowing stocks to recover, closed seasons during spawning, and rules on minimum net mesh sizes so young fish escape. These directly reduce over-fishing and are easy to understand. However, regulation needs monitoring and enforcement, causing excessive administrative costs, and the oceans are vast, so there may be unintended consequences such as illegal fishing.

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Third, the government could award fishing permits to companies that are tradable. A firm that catches less than its permit allows can sell the spare permits to other firms, so the total catch is capped while fish are caught by the most efficient firms, and firms have an incentive to adopt sustainable methods. This is a market-based solution. However, it is hard to set the right number of permits, and large firms may buy up permits, reducing competition and harming small fishing communities.

Fourth, property rights could be extended, for example to international waters or to specific fishing grounds, so that someone owns the stock and has an incentive to conserve it, as Extract B suggests the lack of ownership causes the tragedy of the commons. In practice it is very difficult to establish ownership of moving fish across vast oceans.

Fifth, the government could provide information, such as campaigns and sustainable seafood labels, so that consumers can be encouraged to consume sustainably and switch from over-fished cod to species such as haddock. This is relatively cheap, but consumers may ignore it or be unaware of the extent of the damage, so the effect may be small. A subsidy could also be paid to firms to use safer technology, such as nets that reduce bycatch, but this has an opportunity cost for the government, and a minimum price for fish could reduce quantity demanded, but it may create a surplus that is wasted.

When evaluating these options, there is a risk of government failure, as governments may be unaware of the right level of intervention, and the relative costs and benefits of government intervention must be compared with market-based solutions. International cooperation is also essential, since fish stocks cross borders, and the UK may increasingly over-fish since leaving the EU unless agreements are reached with the EU and coastal states such as Norway.

Overall, no single policy is perfect. Regulation such as protected areas is likely to be the most effective in the short run because it directly allows stocks to recover, while tradable permits and taxes give firms a long-run incentive to fish sustainably. The best approach is

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a combination of policies, backed by strong enforcement and international agreement.

(Total for Question 6 = 60 marks)

TOTAL FOR SECTION B = 60 MARKS
TOTAL FOR PAPER = 80 MARKS

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