



Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2025

Centre Number

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Candidate Number

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Economics

StemUp Model Solution

Assessment Unit AS 1

assessing

Markets and Market Failure



[SEC11]

SEC11

MONDAY 12 MAY, MORNING

TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page. Answer **all** questions in Sections **A** and **B**, and **one** question in Section **C**. You are permitted to use a calculator in this paper.

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page or on blank pages.

Complete in black ink only. **Do not write with a gel pen.**

INFORMATION FOR CANDIDATES

The total mark for this paper is 80.

- Section A: 25 Marks
- Section B: 35 Marks
- Section C: 20 Marks

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question. This paper is accompanied by a Case Study Booklet.

ADVICE TO CANDIDATES

You are advised to take account of the marks for each part question in allocating the available examination time. In questions involving calculations, you are advised to show your workings.

Quality of written communication will be assessed in Questions **4(c)**, **5(b)**, **(c)** and **(d)**, **6** and **7**. Quantitative skills will be assessed where appropriate.

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Section A (25 marks)

Answer all questions

- 1 Robotic lawnmowers with integrated satellite navigation systems and smart technology have revolutionised lawn care in the UK and can now be seen mowing grass on the nation's golf courses and gardens in residential areas.

With reference to robotic lawnmowers, explain the difference between capital goods and consumer goods. [4]

Capital goods are man-made goods used in the production of other goods and services, rather than being consumed for their own sake, e.g. machinery and tools. Consumer goods are goods and services bought by households for final consumption, which satisfy wants and needs directly.

A robotic lawnmower bought by a golf course is a capital good, because it is a fixed asset used in the productive process to provide a service (a well-kept course that golfers pay to play on). However, the same robotic lawnmower bought by a household to cut the grass in its own garden is a consumer good (a consumer durable), as it directly satisfies that household's wants. So whether it is a capital or a consumer good depends on who uses it and for what purpose.



- 2 The table below shows the marginal utility an individual derives from the consumption of successive slices of carrot cake.

Number of slices eaten	Marginal utility (utils)
1	50
2	30
3	10
4	-5
5	-25

With reference to the 4th slice of cake, explain the difference between marginal utility and total utility [4]

Marginal utility (MU) is the additional satisfaction gained from consuming one extra unit of a good, whereas total utility (TU) is the total satisfaction gained from consuming a given quantity of the good, i.e. the sum of the marginal utilities.

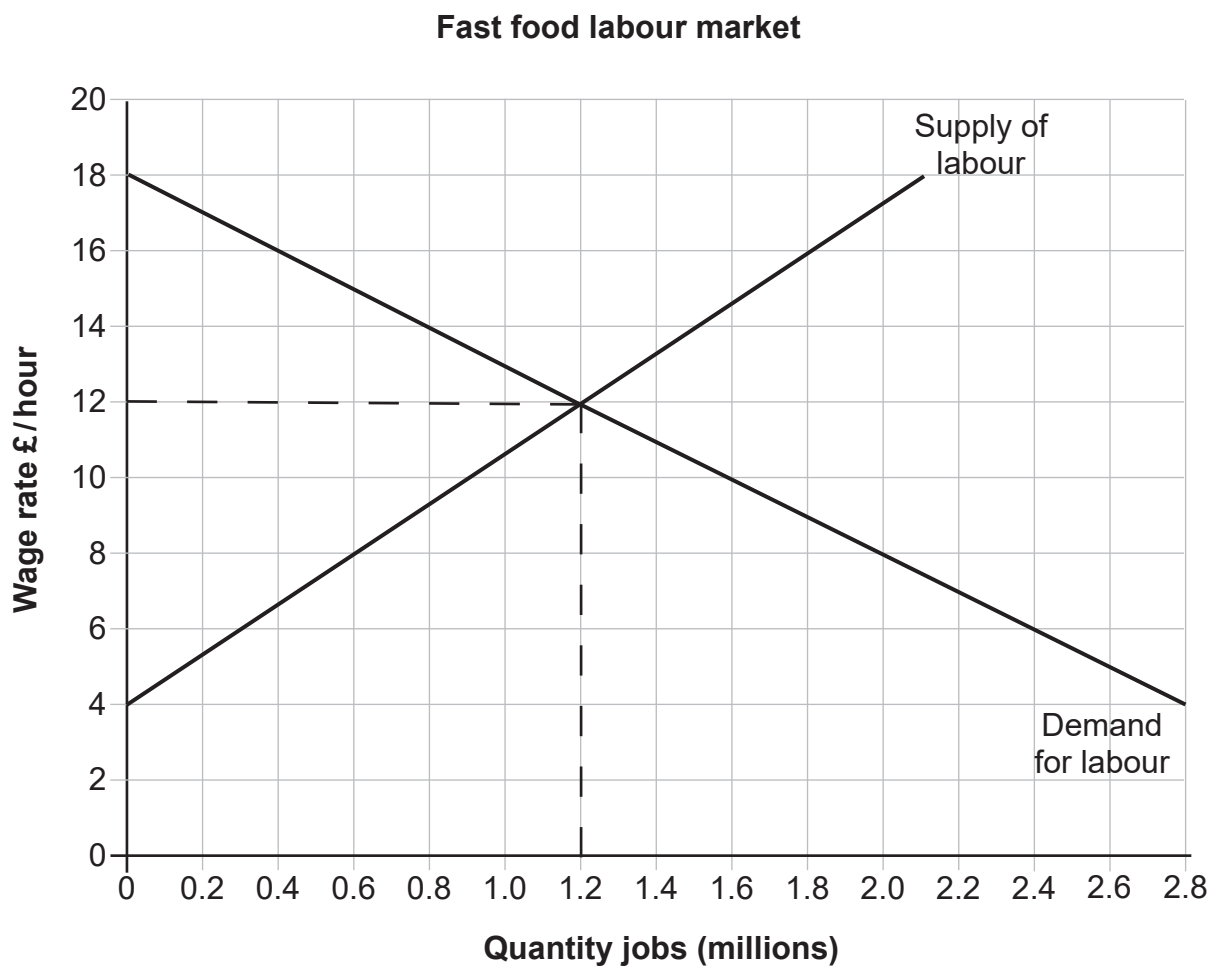
The MU of the 4th slice of cake is -5 utils: eating it actually reduces satisfaction, as diminishing marginal utility has made MU negative.

The TU of eating 4 slices is $50 + 30 + 10 + (-5) = 85$ utils. TU was maximised at 3 slices (90 utils) and falls to 85 utils when the 4th slice is eaten, because its MU is negative.

[Turn over]



- 3 The diagram below shows the demand for and the supply of workers in the UK fast food labour market.



Using the information in the diagram opposite, calculate the total level of economic rent earned per hour by workers in the UK fast food labour market. [3]

Economic rent is the payment to a factor of production above its transfer

earnings: the area below the equilibrium wage and above the supply of labour curve.

Equilibrium: wage = £12 per hour, quantity = 1.2 million jobs. Supply curve starts at £4.

Economic rent = $\frac{1}{2} \times (£12 - £4) \times 1.2 \text{ million}$

= $\frac{1}{2} \times £8 \times 1,200,000 = £4.8 \text{ million per hour}$

[Turn over]



- 4 The table below shows estimates of the price (PED) and income (YED) elasticities of demand for craft beer and wine. The table also shows the cross-price elasticity of demand (XED) for wine with respect to a change in the price of craft beer.

Product	PED	YED	XED
Craft beer	-0.76	1.15	
Wine	-1.36	0.86	1.25

- (a) Using the information above, explain the distinction between a normal good and a luxury good. [4]

A normal good is a good for which demand increases as income increases, i.e. its income elasticity of demand (YED) is positive. Both craft beer (YED +1.15) and wine (YED +0.86) are normal goods.

A luxury good is a normal good for which demand rises more than proportionately to a rise in income, i.e. YED is positive and greater than 1 (income elastic). Craft beer, with a YED of 1.15, is a luxury good: a 10% rise in income raises demand by 11.5%. Wine (YED 0.86) is a normal good but not a luxury, as a 10% rise in income raises demand by only 8.6%. So all luxury goods are normal goods, but not all normal goods are luxuries.



(b) There has been a 10% increase in the price of craft beer. Using the information opposite, calculate the likely percentage change in:

(i) sales of craft beer; [2]

$$\% \Delta Q_d = PED \times \% \Delta P$$

$$= -0.76 \times (+10\%) = -7.6\%$$

Sales of craft beer are likely to fall by 7.6%.

(ii) sales of wine. [2]

$$\% \Delta Q_d \text{ wine} = XED \times \% \Delta P \text{ of craft beer}$$

$$= +1.25 \times (+10\%) = +12.5\%$$

Sales of wine are likely to rise by 12.5%, as wine and craft beer are substitutes (positive XED).

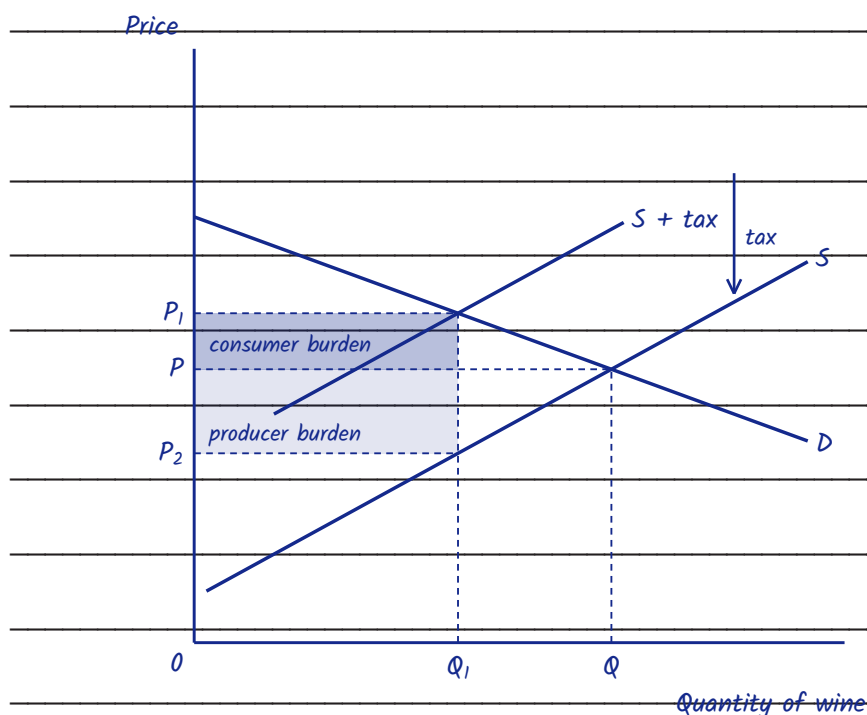


- (c) With the aid of an appropriate diagram, analyse how, all other things being equal, the burden of an indirect tax on wine is likely to be split between producers and consumers.

[6]

Quality of written communication will be assessed in this question.

The burden (incidence) of an indirect tax, a tax on spending such as excise duty or VAT, is how it is shared between consumers and producers, and it depends on price elasticity of demand (PED). A specific tax (a fixed amount per unit, like the UK excise duty on wine per litre) shifts the supply curve vertically upwards, to the left, by the amount of the tax, from S to $S + \text{tax}$, as it raises firms' costs per unit. An ad valorem tax (a percentage of price, like VAT) would pivot the supply curve instead.



The data shows the PED of wine is -1.36 , so demand is price elastic: a 1% rise in price causes a 1.36% fall in quantity demanded, because wine has substitutes such as craft beer (XED $+1.25$). As demand is elastic,



producers cannot pass much of the tax on to consumers, since raising the price by the full amount of the tax would cause sales to fall sharply.

As the diagram shows, the price consumers pay rises only from P to P_1 , while the price producers receive after paying the tax falls from P to P_2 .

The consumer burden is $(P_1 - P) \times Q_1$ and the producer burden is $(P - P_2) \times Q_1$. Since $P - P_2$ is larger than $P_1 - P$, most of the tax burden falls on producers. Total tax revenue is $(P_1 - P_2) \times Q_1$.

Quantity falls by a relatively large amount, from Q to Q_1 , so wine producers suffer a fall in sales revenue and profit as well as paying most of the tax, which could lead to job losses in the industry. Consumers pay only a slightly higher price but buy less wine and some switch to substitutes such as craft beer.

However, incidence also depends on price elasticity of supply: the more price elastic supply is, the more of the burden is passed on to consumers. Also, -1.36 is only an estimate and PED may differ between cheap and premium wines. Nevertheless, all other things being equal, because demand for wine is price elastic the larger share of the burden is likely to fall on producers.

[Turn over



Section B (Case Study) (35 marks)

Answer all questions

Read the information in the Case Study Booklet and answer the questions below.

- 5 (a) Using the information in **Fig. 1**, compare health spending per capita in the UK with that of other high-income countries. [5]

UK health spending per capita in 2022 was \$5,387, which is below the average of the countries in Fig. 1 (\$6,778). The UK spends only about 79% of the average ($5,387 \div 6,778 \times 100 = 79.5\%$), i.e. \$1,391 less per person.

The UK spends less per capita than every other country in Fig. 1 except Belgium (\$5,274), and only about 2% more than Belgium ($5,387 \div 5,274 = 1.02$), so it is the second lowest spender of the ten countries.

The UK spends less than half of the highest spender, the USA (\$12,318): about 44% ($5,387 \div 12,318 \times 100 = 43.7\%$), a gap of \$6,931 per person.

It spends about 73% of the second highest spender, Germany (\$7,383), and less than similar European economies such as France (\$5,468) and Sweden (\$6,262).

This supports paragraph 2's claim that the UK spends less than many other high-income countries per capita. However, the figures are in US\$ and do not account for differences in price levels or efficiency, so lower spending does not necessarily mean worse care.



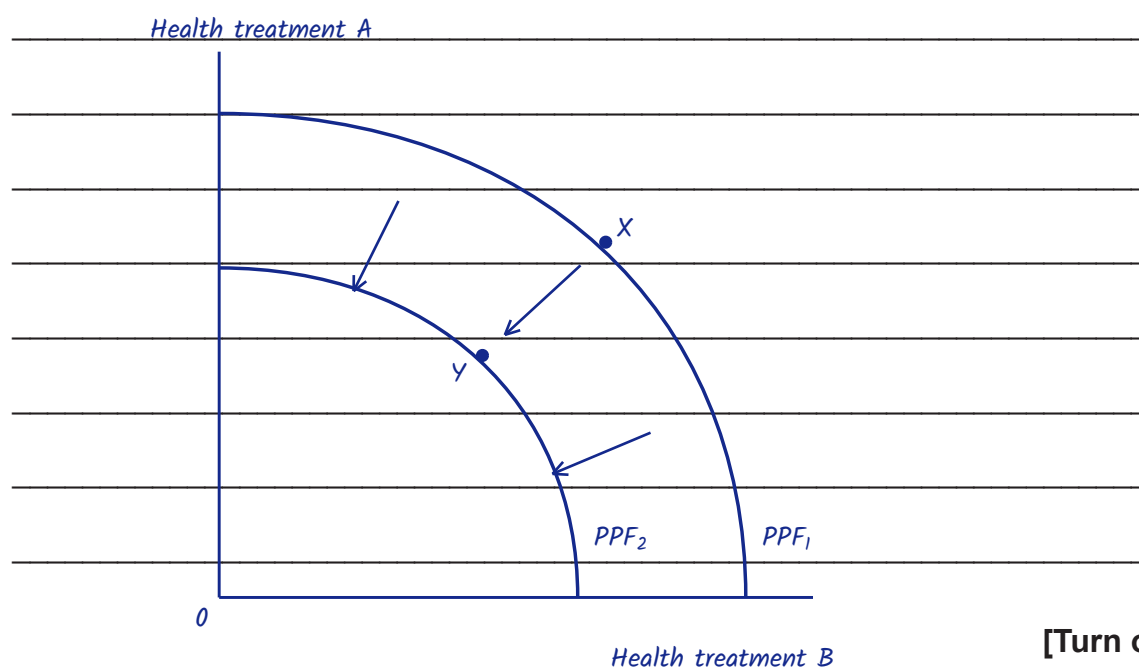
- (b) With the aid of a PPF diagram, explain the likely impact of a reduction in staff and capital resources on the productive potential of the NHS.

[6]

Quality of written communication will be assessed in this question.

A production possibility frontier (PPF) shows the maximum combinations of two goods or services that can be produced when all resources are fully and efficiently employed, given the state of technology. For the NHS, it shows the maximum combinations of two types of health treatment (A and B) it can provide with its labour and capital resources.

The case study shows that underfunding since 2011 has reduced both the quantity and quality of NHS resources. Capital: hospital beds have been cut so that the UK has fewer beds per capita than almost any developed nation, and it has fewer CT and MRI scanners (paragraph 3). Labour: real terms pay cuts have caused a recruitment crisis, with 15 000 nurses resigning in 2022, leaving 133 000 vacant posts as highly qualified staff leave for the private sector or abroad.



[Turn over]

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Losing experienced staff also reduces the quality of human capital (skills and experience), so the productivity of the remaining staff falls, for example as overstretched nurses cover more patients. Ageing, broken equipment that is not replaced reduces the quality of physical capital too. With fewer and lower quality factors of production, the maximum amount of health care the NHS can provide falls, i.e. its productive potential is reduced. As the diagram opposite shows, this is an inward (leftward) shift of the PPF from PPF_1 to PPF_2 . Combinations such as X, which were attainable on PPF_1 , become unattainable; the NHS can now only reach a point such as Y on PPF_2 , providing fewer of both treatments. This helps explain why hospital waiting lists exceeded seven million in 2023 (paragraph 1).

If the cuts mainly affect resources specialised in one type of treatment (e.g. scanners used for diagnosis), the PPF would pivot inwards on that axis rather than shift in parallel. The size of the shift depends on how large and how long-lasting the cuts are: capital depreciates without investment and new doctors and nurses take years to train, so the fall in capacity may persist even if funding later rises.



- (c) With the aid of an appropriate diagram, explain why health care may be underconsumed in a free market economy (paragraph 4).

[9]

Quality of written communication will be assessed in this question.

Market failure occurs when the free market price mechanism fails to allocate resources efficiently, so the socially optimal output is not produced.

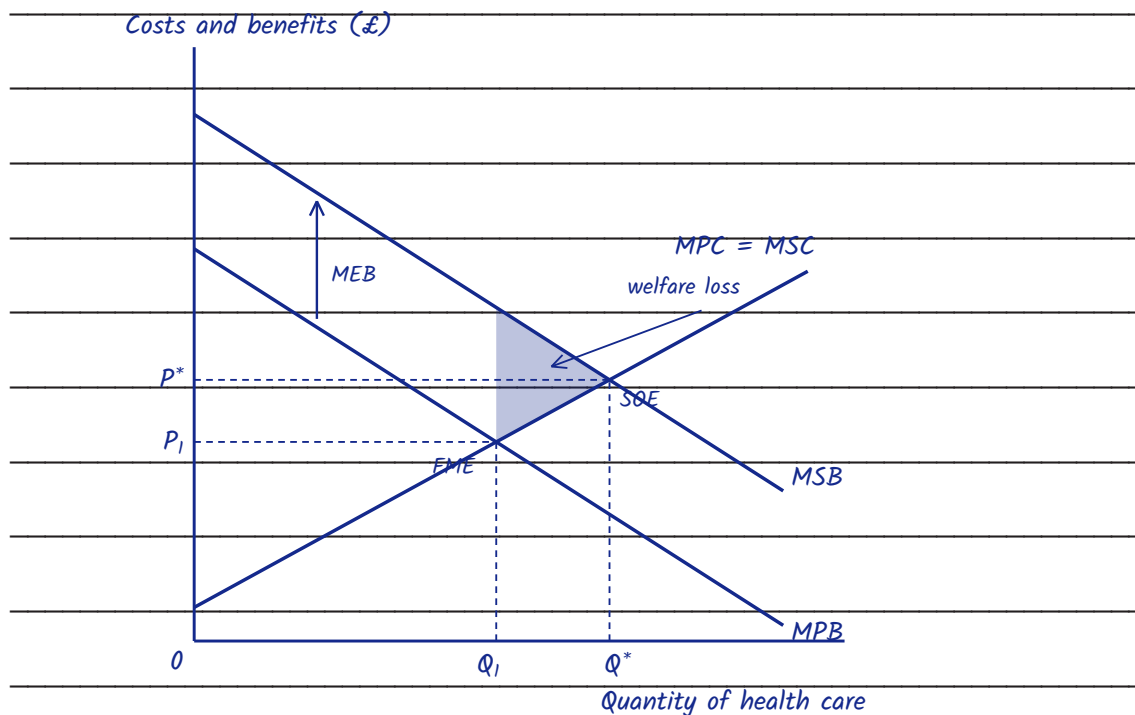
Health care is a merit good: a good which is beneficial to individuals and society but which would be underconsumed, and so underprovided, if left to the free market, because of positive externalities and information failure.

Positive consumption externalities: when one person consumes health care, e.g. a vaccination or treatment for an infectious illness, third parties also benefit. Others are less likely to catch the disease, and a healthier workforce is more productive, with less absence from work, raising output and tax revenue. These external benefits mean that the marginal social benefit ($MSB = MPB + \text{marginal external benefit}$) is greater than the marginal private benefit (MPB) to the individual.

In a free market, consumers only take their private benefit into account, so they consume where $MPB = MPC$, at the free market equilibrium (FME), Q_1 at price P_1 . The socially optimal equilibrium (SOE) is where $MSB = MSC$, at Q^* . As the diagram shows, Q_1 is less than Q^* , so health care is underconsumed by $Q^* - Q_1$.

[Turn over]





The shaded triangle is the welfare loss to society: each unit between Q_1 and Q^* has a social benefit greater than its social cost, yet it is not consumed, so resources are misallocated.

Information failure: consumers often lack full information about the benefits of health care. There is asymmetric information between doctors and patients, and people may underestimate the long-term benefits of check-ups, screening or vaccinations, especially if they are short-sighted. Their perceived MPB is below the true MPB, so demand is even further below the social optimum.

Ability to pay: in a free market, health care is rationed by price. As

Professor Gribben argues in paragraph 4, 'free markets will always fail to provide adequate levels of health care, particularly for lower income groups'.



Low-income households may be unable to afford treatment or insurance even when they need it, so their effective demand is low, as shown in the US, where many people are uninsured. Health care costs are also unpredictable and can be very large, and private insurance markets suffer from adverse selection and moral hazard, so higher-risk people, e.g. those with pre-existing conditions, may be priced out.

Therefore, without government intervention such as provision free at the point of use through the NHS, or subsidies, health care is likely to be underconsumed relative to the socially optimal level Q^* .

[Turn over



- (d) Critically examine some of the policies the UK government could use to improve the quality of health care in the UK. [15]

Quality of written communication will be assessed in this question.

The quality of health care in the UK is under pressure: waiting lists exceeded seven million in 2023 and the UK spends only \$5,387 per capita, below the \$6,778 average in Fig. 1. The government could use several policies, each with costs and benefits.

Increase funding through higher taxes: Peter Carlin argues the government should 'significantly increase the amount of money it provides to the NHS', even if this requires higher taxes. A rise in income tax or National Insurance could be ringfenced for the NHS, or sin taxes on cigarettes, alcohol and sugary foods could be raised. Extra funding could raise pay to tackle the 133 000 vacancies and fund more beds and scanners, shifting the NHS PPF outwards and cutting waiting lists. Sin taxes also reduce consumption of demerit goods, reducing future demand for health care.

However, there is an opportunity cost, as money could be spent on education or housing, and higher income tax may reduce incentives to work.

Sin taxes on goods with price inelastic demand raise revenue but are regressive. More money may also be wasted if, as David Strathearn claims, the NHS is 'bureaucratic and wasteful', and there are long time lags in training staff and building capacity.

User charges for GP and routine hospital visits: because NHS care is free at the point of use, demand is very high and some visits are unnecessary



(moral hazard). A flat fee would ration demand, cut waiting times and raise revenue for more pressing needs. However, demand for essential care is price inelastic, so charges may mainly deter low-income patients who need care, worsening health inequality and creating higher costs later if illnesses go untreated, which conflicts with the merit good principle. Exemptions for children, pensioners and low-income groups would be needed but add administration costs.

Tax breaks for private health insurance: this would encourage people who can afford it to use private care, reducing demand on the NHS and freeing resources. However, much of the subsidy would go to higher-income households who would buy insurance anyway (deadweight), it reduces tax revenue available for the NHS, and growth of the private sector may attract more staff away from the NHS, worsening shortages.

Denying treatment to those with unhealthy lifestyles: this could free resources for those who are ill through no fault of their own and act as a nudge to change behaviour. However, it is ethically controversial, it is hard to prove that a lifestyle caused an illness, and smokers or the obese may be addicted or poorly informed, so the incentive may not work. It also undermines the NHS's core principle of universal care.

Privatisation: Strathearn argues opening the NHS to market forces would restore the profit motive and the price mechanism, increasing productive efficiency through competition and consumer choice. However, health care is

[Turn over



a merit good with positive externalities and information failure, so a free market would underprovide it (market failure), and those on low incomes may be excluded. The USA, which relies most on the market, spends \$12,318 per capita, more than double the UK, yet has worse outcomes on some measures such as life expectancy, so privatisation could replace market failure with high costs and inequality. A middle way would be social insurance systems such as those in France (\$5,468) and Germany (\$7,383), funded by compulsory contributions.

In conclusion, no single policy is sufficient. In the short run, the most effective policy is likely to be increased, ringfenced funding targeted at staff pay and capital, since the lack of resources is the main cause of falling quality. However, its success depends on how efficiently the money is spent, so it should be combined with reforms to reduce waste and possibly modest user charges with exemptions for the vulnerable. Full privatisation or denying treatment would risk government failure and greater inequality, so they are the least desirable options.





Section C (20 marks)

Answer **either** question 6 **or** question 7

Quality of written communication will be assessed in these questions.

- 6 One of the UK's leading doctors has raised the alarm about the exploding popularity of vaping (inhaling vapour created by electronic cigarettes) among teenagers, saying that, without urgent action, a generation could end up with long-term addictions and lung damage. Anti-vaping campaigners have called on the UK government to follow the lead of Australia and introduce a complete ban on all disposable vaping products in the UK.

Critically examine the case for a ban on all disposable vaping products in the UK.

[20]

or

- 7 A new report has claimed that income and wealth inequality in the UK is increasing rapidly as real wages fall and interest rates rise. The report also points out that it is younger households that are suffering the most. While many on the political left are concerned about the rising gap, those on the political right argue that inequality is an inevitable feature of a free-market economy and governments should not be worried about it.

Critically examine the view that governments should not be worried about rising levels of income and wealth inequality.

[20]



Write the number of the question you have chosen in the box below:

6

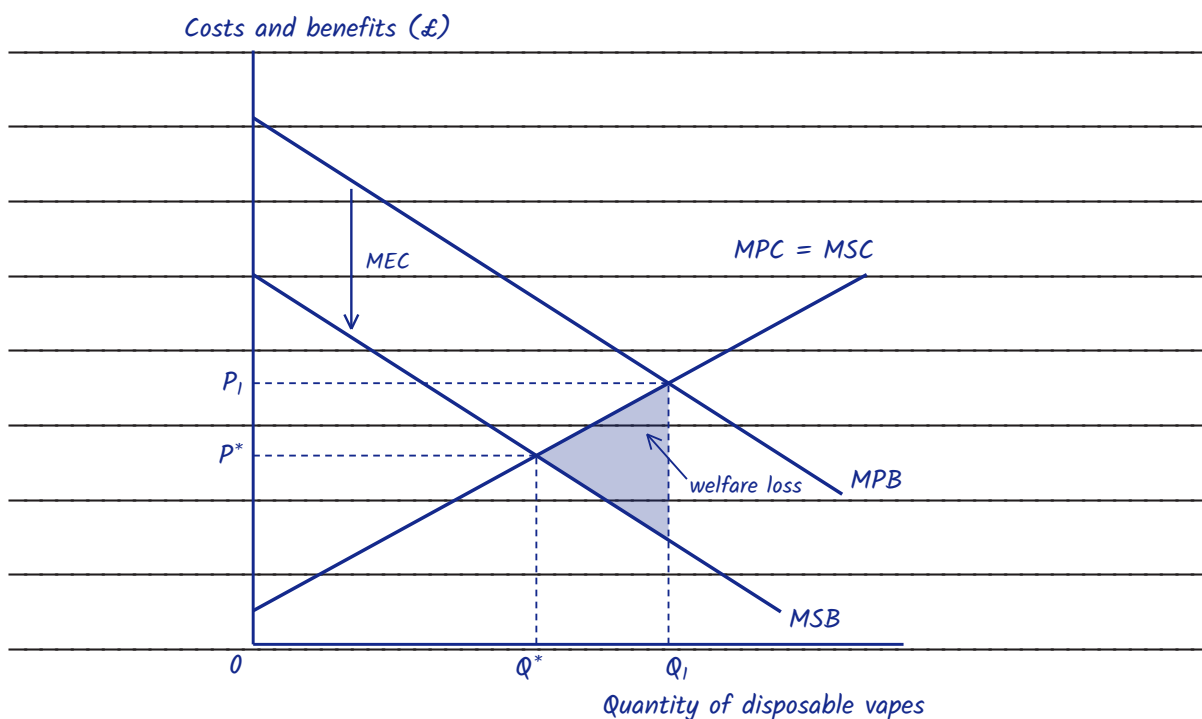
Disposable vapes are single-use electronic cigarettes that deliver nicotine through inhaled vapour. A ban (prohibition) would make their sale illegal. Vapes can be seen as a demerit good: a good that is more harmful to the consumer and society than consumers realise and which is overconsumed in a free market, due to negative externalities and information failure.

Case for a ban: first, information failure and addiction. Disposable vapes are cheap and marketed with bright colours and fruit flavours that appeal to teenagers. Young people underestimate the long-term risk of nicotine addiction and lung damage the doctor warns of, and once addicted their demand becomes price inelastic and their choices are no longer rational. As individuals, especially children, are not always the best judges of their own interests, there is a paternalistic case for government to protect them, even from themselves.

Second, negative consumption externalities. Vaping imposes external costs on third parties: NHS treatment costs for lung damage and addiction funded by taxpayers, lost productivity, and disruption to schools and educational outcomes. The marginal social benefit (MSB) of vapes is therefore below the marginal private benefit (MPB), as the diagram shows.

[Turn over





In a free market, consumers consume where $MPB = MPC$ at Q_1 , but the socially optimal output is Q^* , where $MSB = MSC$. Disposable vapes are overconsumed by $Q_1 - Q^*$, causing the shaded welfare loss. A ban would remove the overconsumption of disposables entirely.

Third, negative production and environmental externalities. Millions of disposable vapes are thrown away in the UK every week, and most end up in landfill or as litter, despite containing lithium batteries, plastics and chemical pollutants. The lithium is a scarce resource that is wasted, and the batteries cause fires in bin lorries and waste sites. Producers and consumers do not pay these costs, so the price is too low.

Fourth, current regulation is failing. It is already illegal to sell vapes to under 18s, yet teenage vaping is 'exploding', so weak enforcement means stronger



action is needed. A complete ban, as in Australia, is simple to understand and enforce at retail level, and sends a clear signal that vaping is harmful, which may reduce the number of young people starting.

Case against a ban: first, vapes are a useful smoking cessation device. Vaping is far less harmful than smoking cigarettes, and cheap, easy to use disposables help many adult smokers quit. If they are banned, some adults may return to smoking, a substitute, which could increase total harm and NHS costs. However, this argument is weaker for disposables specifically, as reusable vapes would still be available to smokers trying to quit.

Second, a ban may simply create a black market. As addicted users have price inelastic demand, they will seek illegal supplies, which are unregulated, may contain dangerous substances and are sold with no age checks at all, so children may find them easier to buy. The government would also lose VAT revenue and face high enforcement costs for Trading Standards and Border Force. Evidence from the prohibition of drugs, and of alcohol in the USA in the 1920s, suggests bans often fail to stop consumption. This money might be better spent educating young people about the dangers of vaping.

Third, substitution: teenagers may switch to cheap refillable vapes, so a ban on disposables could reduce litter but not nicotine addiction. Fourth, a ban limits freedom of choice for adults who vape responsibly, and the government may lack the information to set the right level of intervention, risking government failure.

[Turn over



Alternatives: an indirect tax on disposable vapes in line with cigarettes would raise the price, reduce consumption towards Q^* and internalise the externality, while raising revenue that could fund the NHS or education campaigns. Other policies include banning flavours and colourful packaging aimed at children, plain packaging, moving vapes out of view in shops, bigger fines for retailers selling to under 18s and a deposit-return scheme for batteries. However, taxes are less effective when demand is price inelastic and may still leave the environmental damage.

Conclusion: the case for a ban on disposable vapes is strong, because this particular product combines high environmental external costs with strong appeal to children, while reusable vapes remain available for smokers trying to quit, so the main cost of a ban is limited. However, the success of a ban depends on effective enforcement and the size of any black market, and on whether young users switch to other vapes. In the long run, a ban is therefore most likely to succeed if it is combined with taxes on all vaping products, flavour and packaging restrictions and education, rather than used on its own.





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THIS IS THE END OF THE QUESTION PAPER



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Question Number	Marks
Section A	
1	
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Total Marks	
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Examiner Number

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Rewarding Learning

**ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2025**

Economics

Assessment Unit AS 1
assessing
Markets and Market Failure

[SEC11]

MONDAY 12 MAY, MORNING

CASE STUDY BOOKLET

Read the following information and answer Question 5 in the question and answer booklet.

The following article was written in July 2023.

The NHS: a service in need of care

UK voters love the idea of the National Health Service. Its core principle of providing universal care, free at the point of use, is regarded with an almost religious reverence by most people. However, the NHS is in a critical condition! The UK has fewer hospital beds per capita than most other rich countries and some of the worst survival rates for cancer and other major illnesses such as heart attacks and strokes. In 2023, hospital waiting lists exceeded the seven million mark for the first time ever.

1

Health spending accounts for a vast chunk of UK government expenditure. However, expenditure on health in real terms has been on the decline since 2011 and the UK now spends less than many other high-income countries, both as a share of GDP and on a per capita basis, as shown on the chart below.

2

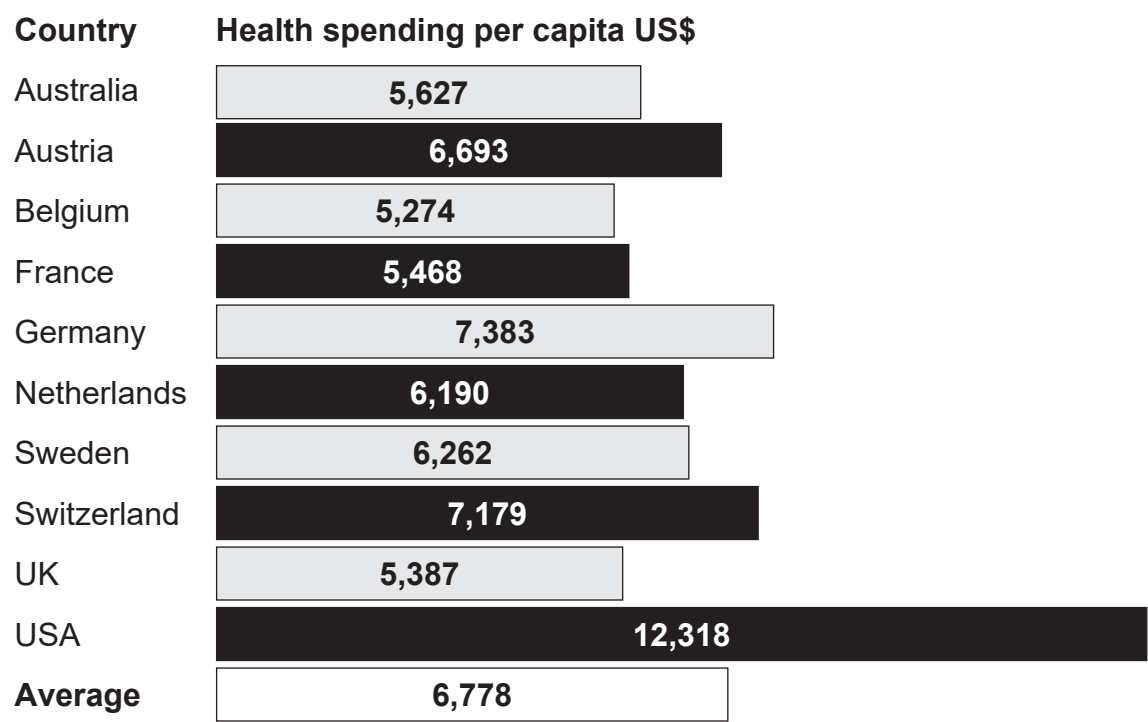


Fig. 1: Per capita health spending in UK and selected high-income countries, 2022

This lack of funding has led to limited investment in infrastructure, capacity and staff. Hospital beds have been cut to the extent that the UK has fewer beds per capita than almost any developed nation. It also has fewer CT and MRI scanners and has greater staff shortages. Real terms pay cuts over the last few years have led to a crisis of recruitment as highly qualified staff leave the NHS and seek better pay and conditions in the private sector or abroad. For example, 15 000 nurses resigned from the NHS in 2022. This left the service with a total of 133 000 vacant posts across a range of positions and very little hope of ever filling them.

3

Adrian Gribben, a professor in health economics, argues that “evidence from the US and elsewhere has shown that free markets will always fail to provide adequate levels of health care, particularly for lower income groups, therefore some form of government provision will always be required”. Peter Carlin, an NHS consultant, says that “the government needs to significantly increase the amount of money it provides to the NHS. If this requires higher taxes, then so be it. The whole of society benefits from the NHS and therefore society should pay a little more to ensure it is funded properly. This government provision could be supplemented with alternative policies such as the use of user charges for routine hospital and GP visits, tax breaks for those who purchase private health care, and denying treatments to those who lead unhealthy lifestyles”.

4

However, health economist David Strathearn argues that “the only way to improve health outcomes in the UK is to privatise the NHS and open it up to free market forces. Government provision of health care in the UK has removed the profit motive and the price mechanism and, as such, has led to a bureaucratic and wasteful service which fails to meet the needs of UK citizens”.

5

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