Please check the examination details below before entering your candidate information

Candidate surname: StemUp Model Solution

Other names:

Centre Number

Candidate Number

Pearson Edexcel Level 3 GCE

Thursday 18 May 2023

Morning (Time: 2 hours)

Paper reference **9EC0/01**

Economics A

Advanced

PAPER 1: Markets and Business Behaviour

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 three sections in this question paper. Answer **all** questions from Section A and Section B. Answer **one** question from Section C.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*

Information

- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Calculators may be used.

Advice

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

Turn over ▶

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Pearson

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 30 minutes on this section.

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

1 In a major reform of its command economy, the Cuban government will allow small private businesses to operate in most fields. Free market economists have long called for the role of small business to be expanded to help jump-start the economy and to create jobs.

(Source adapted from: https://www.telegraph.co.uk/news/2021/02/07/cuba-allows-massive-expansion-private-businesses/)

(a) With reference to the information provided, explain **one** advantage of a free market economy.

(4)

One advantage of a free market economy is a more efficient allocation of resources. Private businesses are driven by the profit motive, so they have a greater incentive to cut costs and avoid X-inefficiency, and competition forces them to produce what consumers want at the lowest possible price (allocative and productive efficiency). In Cuba, allowing small private businesses to operate in most fields replaces state planning with price signals and consumer sovereignty, so resources move to where they are most valued. This could help to 'jump-start the economy' and create jobs, as new firms enter markets to earn profit.

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(b) Which **one** of the following economic thinkers supported the idea of a command economy?

(1)

- ☐ **A** Adam Smith
- ☐ **B** Friedrich Hayek
- ☐ **C** John Maynard Keynes
- ☒ **D** Karl Marx

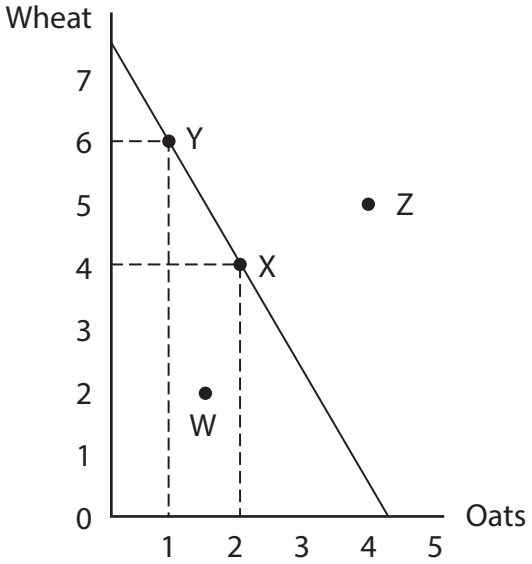
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2 The production possibility frontier shows last year's harvest for a UK farmer at point X.



(a) Calculate the opportunity cost of the decision by the farmer to harvest 6 units of wheat this year at point Y (movement from point X to point Y).

(2)

Moving from X (2 oats, 4 wheat) to Y (1 oat, 6 wheat): 2 more units of wheat are produced.

Opportunity cost = 1 unit of oats given up.

(b) Explain the impact on efficiency of producing at point W in the following year.

(2)

Producing at W, inside the PPF, means efficiency will decrease: the farm is not productively efficient as it is not producing at maximum potential output. There are unemployed resources and spare capacity, so the farmer could produce more of both wheat and oats.

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(c) Which **one** of the following would be most likely to help the farmer reach point Z?

An increase in

(1)

- ☒ **A** investment in milk production machinery
- ☒ **B** investment in modern farming technology
- ☒ **C** the demand for wheat
- ☒ **D** the price of oats

(Total for Question 2 = 5 marks)

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3 A luxury brownie baker is faced with falling demand as incomes fall.

(a) The likely income elasticity of demand for a luxury good is:

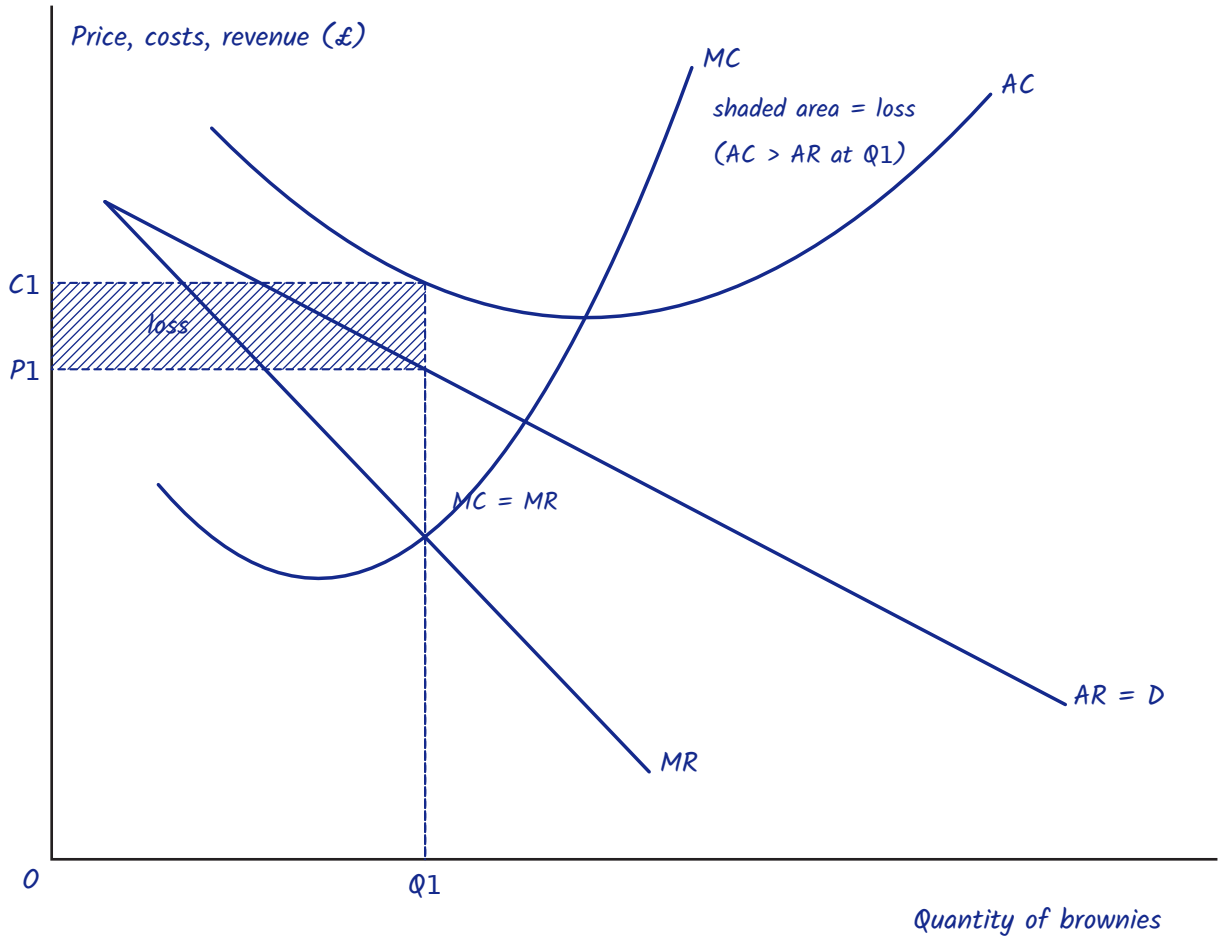
(1)

- ☒ **A** –3.40
- ☒ **B** –0.74
- ☒ **C** +0.74
- ☒ **D** +3.40

(b) Small local bakeries have many of the characteristics of monopolistic competition.

Draw the short run profit maximising equilibrium of a **loss-making** luxury brownie baker.

(4)



(Total for Question 3 = 5 marks)

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QUESTION 4 BEGINS ON THE NEXT PAGE.

4 An annual season ticket for a train journey between London and Reading is planned to increase from £5 044 to £5 664 in 2023.

(Source adapted from: https://commonslibrary.parliament.uk/how-much-could-rail-fares-increase-by-in-2023-and-why)

(a) With reference to the information provided, calculate the percentage change in the price of an annual season ticket.

(2)

% change = (5 664 − 5 044) ÷ 5 044 × 100 = 620 ÷ 5 044 × 100

= +12.3% (12.29%)

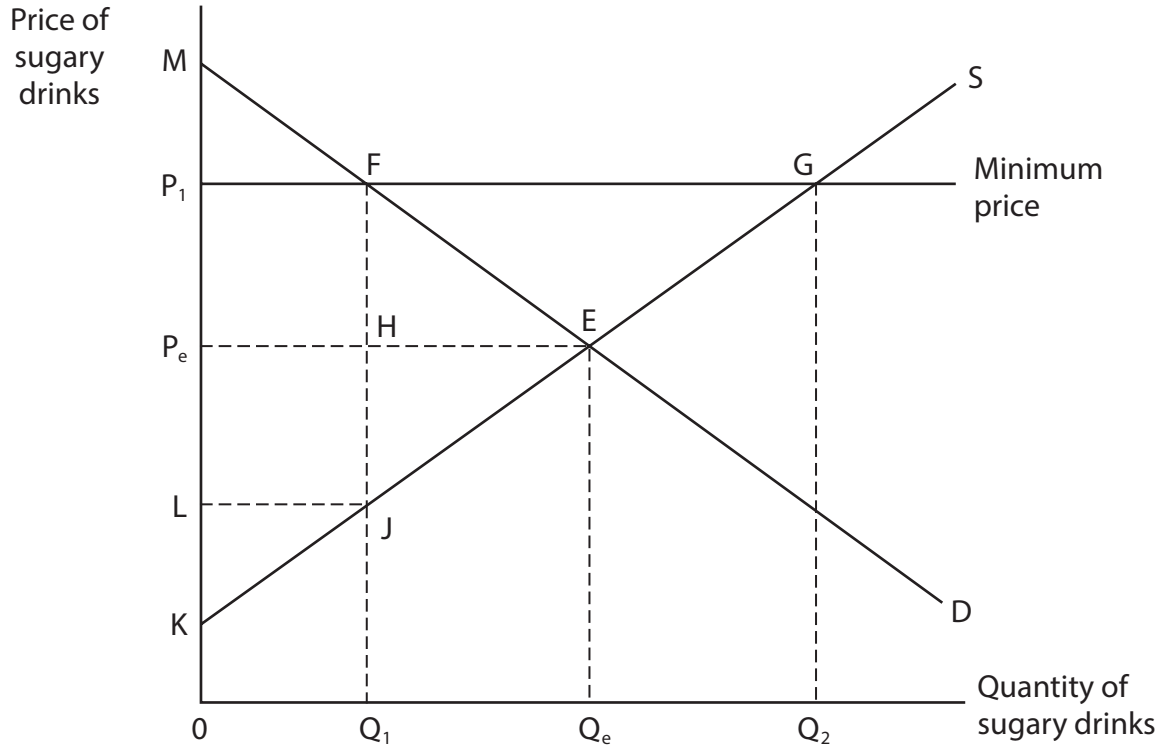
(b) Explain the likely impact of the increase in price of a season ticket on consumer surplus.

(2)

Consumer surplus is the difference between the price consumers are willing to pay and the price they actually pay. The price rise to £5 664 means consumer surplus will fall, as commuters now pay £620 more for each ticket, and some commuters who valued the ticket at less than £5 664 stop buying it, losing their surplus completely.

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The diagram below shows the demand and supply for sugary drinks.



(c) Which **one** of the following areas represents the *change* in producer surplus when a minimum price is imposed?

(1)

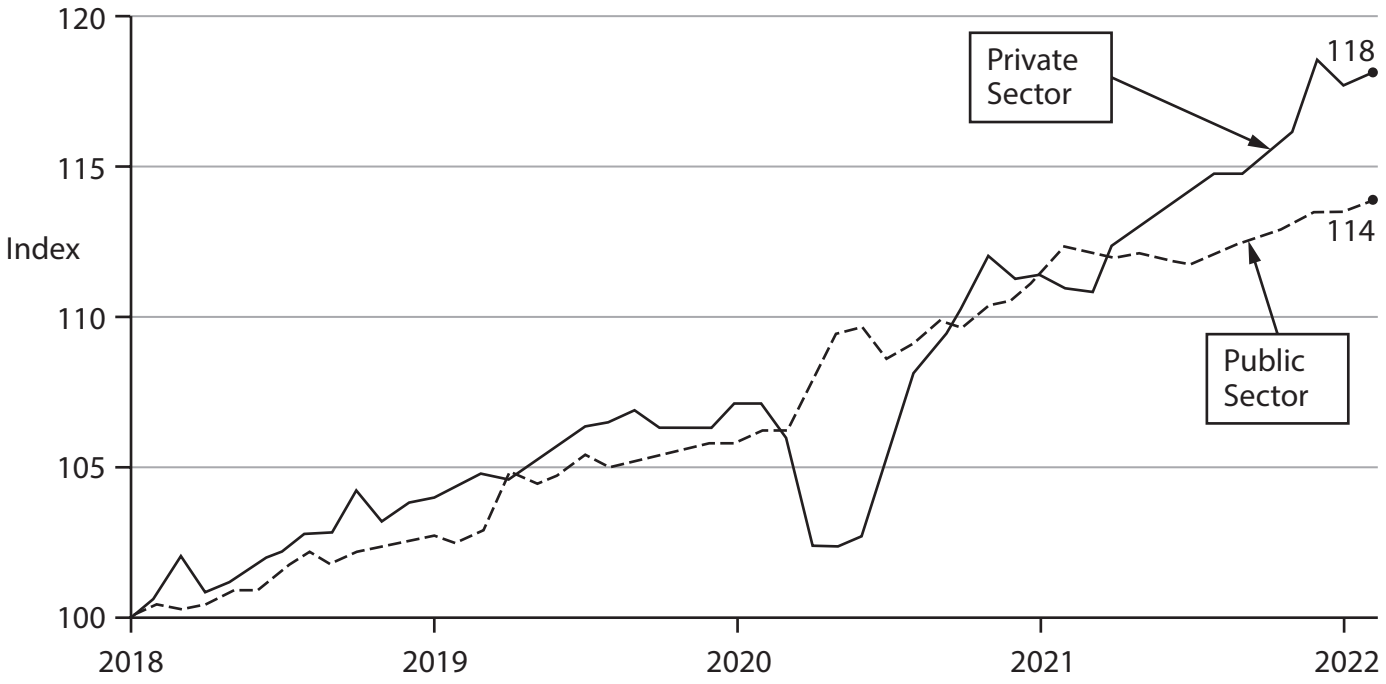
- ☒ **A** FEP_eP_1
- ☒ **B** FMP_1
- ☒ **C** GEP_eP_1
- ☒ **D** GKP_1

(Total for Question 4 = 5 marks)

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5 Index of pay in the public and private sector.

Nominal average weekly earnings (base year January 2018 = 100)



(Source adapted from: https://www.ft.com/content/48dafbb9-371d-4683-9afb-26652add888c)

(a) Which **one** of the following is the ratio of public sector pay relative to private sector pay in 2022?

(1)

- ☒ **A** 1 : 0.97
- ☒ **B** 1 : 1.04
- ☒ **C** 1 : 4.0
- ☒ **D** 1 : 14.0

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(b) Over 90% of nurses work in the public sector. Nurses in the public sector have experienced wage rises lower than those in the private sector over the past 10 years.

(Source adapted from: https://www.nuffieldtrust.org.uk/resource/chart-of-the-week-real-terms-nhs-staff-pay-from-2010-to-2020)

Using the information provided and the concept of monopsony, explain why nurses in the public sector have had lower wage rises than those in the private sector.

(4)

A monopsony is a market with a single dominant buyer, here a buyer of labour, which has the power to set wages below the competitive level. As over 90% of nurses work in the public sector, the NHS (government) is effectively a monopsony employer of nurses. Wages in the public sector are set nationally through a national pay scale, and there is a lack of alternative employers, with very few jobs available in private hospitals. Nurses therefore have little choice but to accept the wage offered, so the NHS can use its monopsony power to hold wages down, for example through pay freezes when the government aims to cut spending and balance the budget.

In the private sector, many firms compete for workers, so they must offer higher wages to attract labour. This is shown in the chart: by 2022 the private sector pay index had risen to 118, compared with only 114 in the public sector.

(Total for Question 5 = 5 marks)

TOTAL FOR SECTION A = 25 MARKS

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SECTION B

Read Figures 1 and 2 and the following extracts (A to C) before answering Question 6.

Write your answers in the spaces provided.

You are advised to spend 1 hour on this section.

Question 6

The UK online streaming services market

Figure 1: Market share of UK online streaming services

	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022
Amazon Prime Video	37.9%	41.1%	45.0%	27.1%	25.9%
Disney+	16.0%	17.7%	19.3%	14.1%	21.5%
Netflix	15.0%	10.5%	5.0%	9.4%	4.5%
NOW	11.3%	11.2%	5.6%	11.0%	11.1%
AppleTV+	4.0%	5.5%	7.3%	9.2%	9.9%
BritBox	4.0%	3.0%	5.7%	6.0%	5.9%
Others	11.8	11.0%	12.1%	23.2%	21.2%

(Source adapted from: Kantar, Worldpanel Division Geotech 2022)

Figure 2: UK online streaming services – monthly fees

Streaming service provider	**September 2022**
Netflix premium (4 users/ultra HD*)	£15.99
Netflix standard (2 users/HD)	£10.99
Netflix basic (single user/non HD**)	£6.99
Amazon Prime Video	£8.99
Amazon Prime Video – Student price	£4.49
Disney+	£7.99
AppleTV+	£4.99

*This is the highest quality picture currently available

** This is the basic quality picture

(Source adapted from: https://www.radiotimes.com/tv/what-to-watch-tv/best-streaming-service-uk/)

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Extract A

How Netflix makes use of behavioural science

In the last few years, companies have been trying to find ways to attract the attention of customers. Various streaming platforms such as Netflix, Amazon, and YouTube use 'nudges' to influence consumer behaviour. The 'next-up' feature on Netflix or 'auto-play' on YouTube has been subject to research that relates it to binge-watching. Binge-watching is the practice of viewing for a prolonged period, multiple episodes of a TV show or several films in rapid succession.

Similarly, the policy of offering a one-month free subscription under the label of 'free trial' requires credit card information to turn the forgetful subscriber into a potential paying one. Following this strategy, Netflix has expanded to 190 countries in just seven years and according to the Wall Street Journal, the company generated total revenue of over $5.2 billion in 2019, which was an increase from 2018 of around $4 billion.

However, 2022 data shows that consumers, increasingly worried about the rising cost of living, are turning their back on Netflix. With a reported cancellation of over 200 000 subscriptions in the first quarter and another two million forecast to leave by the end of the year. Subscribers are rethinking their commitment to the streaming services that grew their numbers sharply during the home-based months of the global health crisis. Netflix subscribers have also quoted a decline in value for money and satisfaction with the quality of the shows as key motives for cancellation.

Disney now see higher satisfaction rankings than Netflix across the quality of shows, amount of original content, number of new-release films, variety of classic films and amount of kids' content. Forecast cancellation rates for Disney+ fell to an all-time low of 3.2%.

(Source adapted from: https://www.novanudge.com/post/sludge-on-demand-how-netflix-makes-use-of-behavioural-science
https://www.theguardian.com/media/2022/apr/20/netflix-shares-fall-losing-subscribers)

Extract B

The economics of price discrimination

Throughout 2022, Netflix, a 100-billion-dollar company, increased prices in the US, Canada, the UK and Ireland (most of which saw similar price increases in 2021, too). In sharp contrast, Netflix recently announced it was reducing its prices in India (standard/2-user 499 rupees a month, equivalent to £5.42) in a bid to compete with Disney+ and Prime.

UK students currently enrolled in a college or university who have a valid student email address can join Prime Student through the Amazon website. This gives them nearly 50% off a standard Prime membership and many other exclusive benefits.

(Source adapted from: https://help.netflix.com/en/node/24926/in)

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Extract C

Educational Website and TV Programmes

BBC Bitesize is a learning platform created by the BBC in 1998. The online study resource allows parents to teach their children from home, using ready-made lesson plans and study guides with questions for all ages. The revision sessions are free to watch and they are available for children aged five up to their late teens. The guides are written by teachers and subject experts, so they are reliable and follow the National Curriculum. Last year Bitesize attracted around two million weekly unique browsers with a peak week of 3.3 million in the GCSE exam period.

Oak National Academy is a freely available learning resource website created for pupils aged four to sixteen. Launched in 2020, as a response to the global health crisis, the website includes lesson slides, video lessons, worksheets, and quizzes conforming to the national curriculum in England. Ministers have set aside £43 million to fund the Oak National Academy over the next three years.

(Source adapted from: https://www.bbc.co.uk/bitesize/articles/zmjdhbk https://www.structural-learning.com/post/oak-academy-a-teachers-guide#:~:text=Oak%20National%20Academy%20is%20a,the%20national%20curriculum%20of%20England)

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6 (a) With reference to Figure 1, explain the market structure that best describes the market for UK online streaming services.

(5)

(b) With reference to the information provided, assess whether Netflix subscribers behave rationally.

(10)

(c) With reference to the information provided, examine the likely numerical value of the cross elasticity of demand between UK online streaming services.

(8)

(d) With reference to Extract C, discuss the likely private and external benefits of viewing educational websites and TV programmes.

(12)

(e) Using examples from Figure 2 or Extract B, discuss the likely impact of price discrimination on a firm's profits. Use a relevant diagram to support your answer.

(15)

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6 (a) With reference to Figure 1, explain the market structure that best describes the market for UK online streaming services.

(5)

The UK online streaming services market is best described as an oligopoly, a market dominated by a few large firms.

Using Figure 1, the five-firm concentration ratio in Q2 2022 = 25.9 + 21.5 + 11.1 + 9.9 + 5.9 = 74.3%, and the three-firm ratio is 58.5% (Amazon Prime Video, Disney+ and NOW). Amazon Prime Video alone has 25.9%, which is above the 25% threshold for monopoly power.

Because there are only a few dominant firms, they are interdependent: each firm must consider the reaction of its rivals when setting prices, which is why prices are similar (£4.99 to £10.99) and Netflix cut its price in India to compete with Disney+ and Prime.

Firms rely on non-price competition, such as original content and free trials, and there are high barriers to entry, such as the huge sunk cost of producing or buying content and brand loyalty. Market shares change rapidly, for example Netflix fell from 15.0% to 4.5%, which suggests strong competition between the large firms.

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(b) With reference to the information provided, assess whether Netflix subscribers behave rationally.

(10)

Rational behaviour in economics means consumers aim to maximise their utility, weighing up costs and benefits with full information and making consistent choices.

There is evidence that many Netflix subscribers behave rationally. Consumers, increasingly worried about the rising cost of living, are cancelling subscriptions: over 200 000 cancelled in the first quarter of 2022 and another two million were forecast to leave by the end of the year. With falling real incomes, subscribers are reducing spending on non-essential services to maximise utility from a smaller budget.

Subscribers have also quoted a decline in value for money and satisfaction with the quality of the shows as key motives for cancelling. If the marginal utility from Netflix is now less than its price of up to £15.99 a month, it is rational to cancel, especially when Disney now has higher satisfaction rankings for the quality of shows, original content and new-release films, at a lower price of £7.99. Switching to Disney+ is a rational response, shown by Netflix's market share falling from 15.0% to 4.5% while Disney+ rose to 21.5%.

In addition, many subscribers joined during the home-based months of the global health crisis, when cinemas and restaurants were closed and there were fewer alternative forms of entertainment. Now these alternatives are available again, the marginal utility of streaming has fallen, so cancelling is rational. Taking a one-month 'free trial' is also rational, as consumers prioritise low prices.

However, there is also strong evidence of irrational behaviour. Netflix uses nudges such as the 'next-up' feature, which encourages binge-watching for prolonged periods, so consumers may watch more than they would choose with full self-control. The free trial requires credit card details to turn the 'forgetful subscriber' into a paying one: this is habitual behaviour and inertia, as people keep paying a regular direct debit regardless of usage, or

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are unaware that they need to cancel after the trial.

Consumers may also suffer from computational weakness and a lack of information, failing to understand the different price plans and so staying on the wrong plan, such as premium at £15.99 when basic at £6.99 would meet their needs. Some buy several subscriptions with similar services and little differentiation, which they do not use.

On balance, the recent mass cancellations suggest that many subscribers are now behaving more rationally, as the cost of living crisis has forced them to compare value for money.

However, this depends on the subscriber: for those still influenced by nudges, habit and free trials, behaviour is bounded rather than fully rational, so Netflix subscribers are only partly rational.

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(c) With reference to the information provided, examine the likely numerical value of the cross elasticity of demand between UK online streaming services.

(8)

Cross elasticity of demand (XED) measures the responsiveness of the quantity demanded of one good to a change in the price of another good: XED = % change in quantity demanded of good A ÷ % change in price of good B. For UK streaming services the XED is likely to be positive (greater than 0), as they are substitutes.

An increase in the price of one streaming service will lead to an increase in the demand for other streaming services, as consumers switch. Figure 1 shows a range of online streaming services providing a similar service, and the growth of competition, with 'Others' rising from 11.8% to 21.2%. The declining market share of Netflix (15.0% to 4.5%) after its price rises in 2021 and 2022 coincided with a rising market share for Disney+ (16.0% to 21.5%). For example, if Netflix standard rose by £1 from £10.99 (a 9.1% rise) and demand for Disney+ rose by 15%, XED = +15 ÷ 9.1 = +1.65, showing close substitutes. Netflix also cut its prices in India to compete with Disney+ and Prime, which suggests it recognises a high positive XED. Similarly, declining satisfaction and cancellations at Netflix lead to an increase in demand at alternatives, where forecast cancellation rates for Disney+ fell to an all-time low of 3.2%.

However, the strength of substitutes may be weak. Each provider offers different shows that are original and unique to them, such as Stranger Things on Netflix, so the XED may be low, positive but less than 1, and fans may not switch.

XED can also vary over time. During lockdown, services were not viewed as substitutes but more as complements, so many consumers had multiple subscriptions. Now, with the cost of living rising and real incomes falling, consumers are forced to choose one service, so they are viewed as stronger substitutes and the XED is likely to be higher and positive.

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(d) With reference to Extract C, discuss the likely private and external benefits of viewing educational websites and TV programmes.

(12)

Private benefits are the benefits received by the consumer of a good. External benefits are the benefits to third parties not involved in the consumption. Marginal social benefit = marginal private benefit + marginal external benefit (MSB = MPB + MEB).

Viewing educational websites such as BBC Bitesize and Oak National Academy gives students private benefits: satisfaction from watching, improved progress at school, GCSE and SATs success, and so career development and higher earnings potential. As the resources are free and written by teachers and subject experts, they are reliable and follow the National Curriculum, so families have less need to buy expensive revision guides or pay private tutors, increasing consumer surplus. Their popularity is shown by Bitesize attracting around two million weekly unique browsers and a peak week of 3.3 million in the GCSE exam period.

There are also external benefits. A better educated population creates a more skilled workforce with higher productivity, which increases the potential output of the economy and leads to greater innovation, higher tax revenue and wider third party effects such as lower crime. Parents also benefit as they are able to teach their children from home.

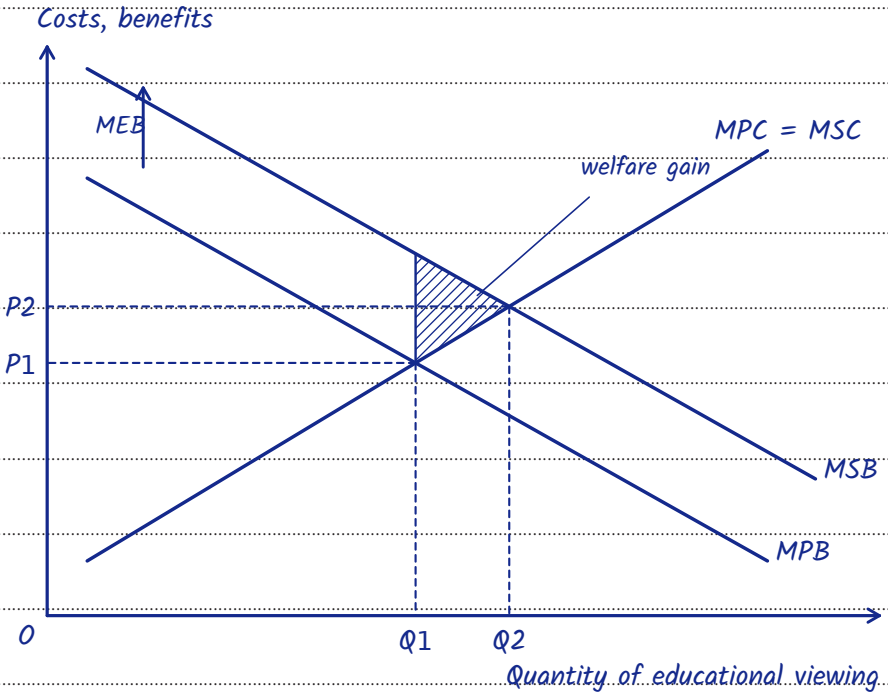
My diagram shows that if consumers only consider private benefits, the market equilibrium is at Q1, where MPB = MPC. The social optimum is at Q2, where MSB = MSC, so educational viewing is under-consumed. Increasing viewing from Q1 to Q2 creates the shaded triangle of welfare gain, which is why ministers have set aside £43 million to fund the Oak National Academy over three years.

However, it is difficult to put a monetary value on the private and external benefits, and there is a time lag of many years before they are seen. Cause and effect is unclear: many other factors influence the skills of the UK workforce and its competitiveness. Oak National Academy was created as an alternative to face to face education during the

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health crisis, so no additional education was necessarily consumed, and its benefits were most significant during home schooling. Some question the effectiveness of online learning without a teacher.

Encouraging children to spend more time on electronic devices may also cause wider social problems such as obesity and addiction to online activity, while producing programmes and devices creates negative externalities such as power consumption. The £43 million has an opportunity cost, and a change in government funding could offset the benefits. Overall,



the benefits are likely to be significant, especially for exam students, but their size is uncertain and depends on how the resources are used.

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(e) Using examples from Figure 2 or Extract B, discuss the likely impact of price discrimination on a firm's profits. Use a relevant diagram to support your answer.

(15)

Price discrimination is when a firm charges different prices to different groups of consumers for the same good or service, where the price differences are not based on differences in cost. Amazon charges students £4.49 for Prime Video compared with £8.99 for adults, nearly 50% off, and Netflix charges 499 rupees (£5.42) for its standard plan in India, compared with £10.99 in the UK.

The conditions necessary are: the firm must have price-setting power; it must be able to separate the markets, for example with a valid student email address or by country; there must be different price elasticities of demand in each sub-market; and it must be able to prevent resale (arbitrage) between them.

My diagram shows the impact on profits. With the same cost structure (MC = AC) in both markets, the firm profit maximises where MC = MR in each sub-market. UK adults have relatively price inelastic demand, as they have higher incomes, so they are willing to pay more and respond less to price rises: price is set high at Pa. Students and consumers in India have price elastic demand, as they have lower incomes and many alternatives, so they are more responsive to price changes and are charged the lower price Pb.

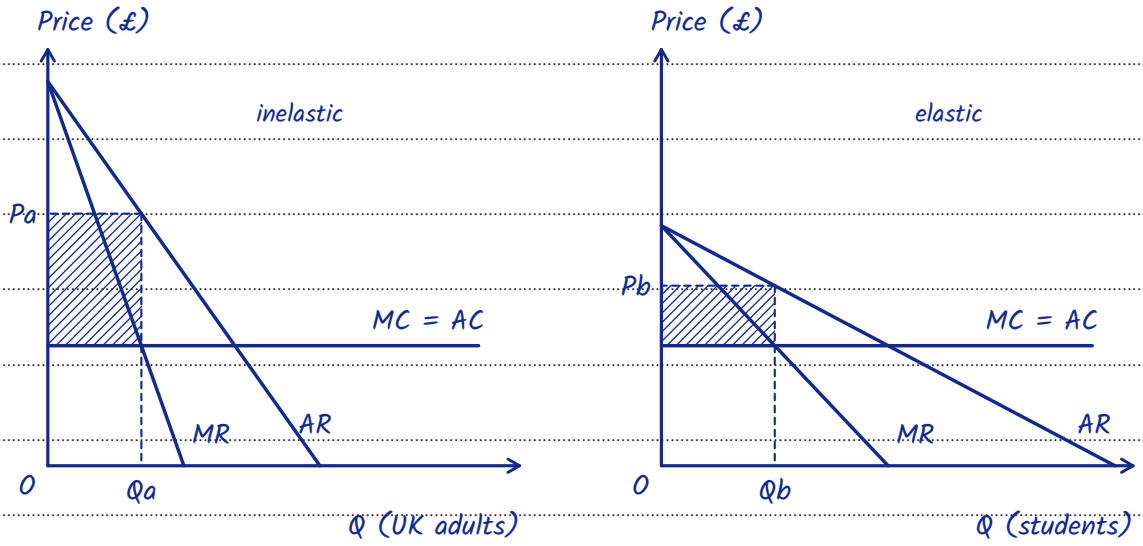
This increases revenue: the firm extracts consumer surplus from inelastic consumers, turning it into producer surplus, while also attracting extra consumers in the elastic market who would not have paid the single price. The shaded areas show supernormal profit in each sub-market, and the firm's total supernormal profit is greater than with a single price.

Higher profits can then be reinvested in new content, which helps explain how Netflix has become a 100-billion-dollar company.

However, the impact on profit may be smaller than expected. The cost to administer the scheme, such as checking student status, could remove the benefits from additional revenue, and it could be hard to ensure that those watching are on the correct price plan.

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Arbitrage is a problem: Netflix passwords are shared between potential users, so consumers in the high-price market avoid paying.



Much of the price variation in Figure 2 is not price discrimination at all, as the product offered is different: Netflix premium at £15.99 gives ultra HD for 4 users, compared with basic at £6.99. Product differentiation may therefore be more effective than price discrimination in raising profit. Also, the magnitude of the price difference, £4.49 v £8.99, may only attract a limited number of extra students.

The loss of market share by Netflix from 15.0% to 4.5% gives consumers more choice, so UK demand is now less inelastic and consumers are less willing to pay higher prices: raising UK prices may reduce revenue rather than increase profit. Investing in new content may be a better way to win back market share and therefore profits. There are also ethical concerns about fairness, which could damage brand image in the long term.

Finally, many other factors are more significant in determining profits, such as the economic slowdown and cost of living crisis, rising levels of competition from Disney+ and AppleTV+, and the market power of movie studios that raise content costs. In conclusion, price discrimination is likely to increase a firm's profits as long as markets can be separated and PEDs differ, but the size of the gain depends on administration costs,

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arbitrage and the strength of competition.

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(Total for Question 6 = 50 marks)

TOTAL FOR SECTION B = 50 MARKS

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SECTION C

Answer ONE question from this section.

Write your answer in the space provided.

You are advised to spend 30 minutes on this section.

EITHER

7 The average UK household energy bill (gas and electric combined) rose 80% from £1 971 in 2021 to £3 549 in 2022.

(Source adapted from: https://www.telegraph.co.uk/money/consumer-affairs/energy-price-cap-rise-october-2022-what-happen-household-bills/)

Evaluate possible methods of government intervention to control household energy bills in the UK.

(Total for Question 7 = 25 marks)

OR

8 Using 2021 estimates of carbon emissions, it is estimated that a petrol car journey from London to Glasgow emits approximately 3.3 times more carbon dioxide per passenger than the equivalent journey by train.

(Source adapted from: https://www.gov.uk/government/statistics/transport-and-environment-statistics-autumn-2021/transport-and-environment-statistics-autumn-2021)

Evaluate possible methods of government intervention to reduce carbon emissions caused by road transport in the UK.

(Total for Question 8 = 25 marks)

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 7** ☒ **Question 8** ☒

Write your answer here:

Question 7

Household energy bills have risen 80%, from £1 971 in 2021 to £3 549 in 2022, mainly because of a rise in wholesale gas prices. The government can intervene in several ways to correct this market failure and protect households, especially those on low incomes for whom energy, a necessity with price inelastic demand, takes up a large share of spending.

The first method is price regulation, such as the Ofgem energy price cap: a maximum price set below the market equilibrium. My diagram shows that a cap at Pmax lowers the price

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paid by households from Pe, directly controlling bills. However, because the cap is below equilibrium, supply contracts to Qs while demand extends to Qd, so there is a risk of shortage. To avoid this, the government can pay suppliers the difference between the cap and the wholesale cost, as with the Energy Price Guarantee. A second method is direct support from the government to households, such as grants, subsidies and payments to help with energy bills, targeted at low income households or those on pre-payment meters. A third method is enhancing competition in the energy market, by promoting small energy businesses, breaking up large suppliers or separating their retail and wholesale divisions, while the CMA investigates any price fixing or collusive behaviour. More competition puts downward pressure on prices and removes supernormal profit. The government could also threaten a windfall tax, which forces companies to pass on falls in wholesale costs to households, or decouple gas and electricity prices through legislation so that cheaper renewable electricity is not priced by gas. Finally, education and information campaigns, and encouraging smart meters to reduce the information gap, help households reduce energy usage and so bills.

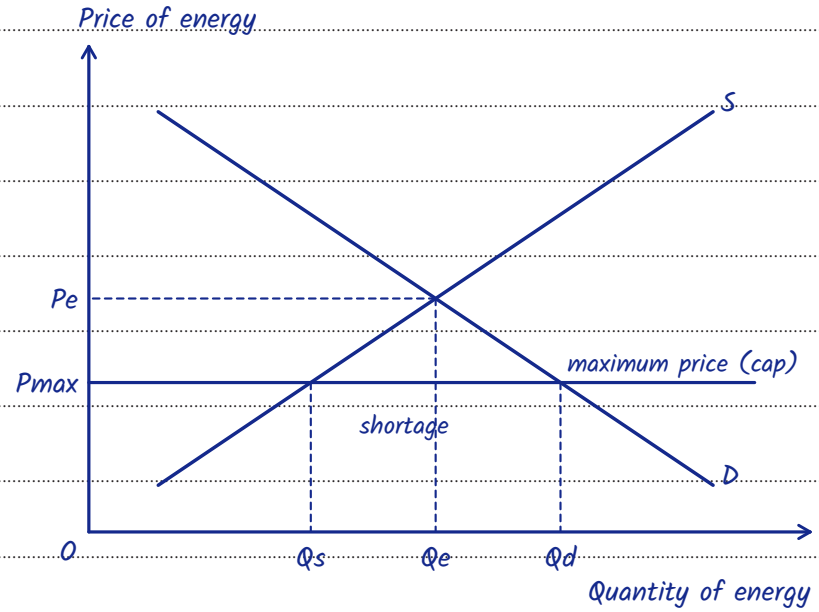
However, each method has weaknesses. A price cap may cause unintended consequences: many energy retailers left the market when the cap was below wholesale costs, reducing competition, and the government may suffer from asymmetric information about firms' true costs, setting the cap at the wrong level. Regulatory capture by the large energy firms is also possible. Paying suppliers the difference has a huge cost and opportunity cost for the government, which could have been spent on health or education, and it increases government borrowing. A universal cap also benefits wealthy households who do not need help.

Direct support can be targeted, but the scale of support needed could change as wholesale prices move, and there are time lags before payments reach households. Subsidies reduce the incentive to cut energy usage, keeping demand high. Promoting competition takes time

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and has little effect when the cause of higher bills is the global price of gas, which suppliers cannot control. A windfall tax may discourage investment in new energy supply. The government could also consider state ownership of energy suppliers, so that prices are set in the public interest rather than to maximise profit for shareholders. Supporters argue this would remove supernormal profits and allow the long-term planning of supply. However, state-owned firms may become x-inefficient without the profit motive and competitive pressure, costs may rise and the purchase of the firms would require huge government spending, so bills might not actually fall.

When weighing up the methods, the cause of the problem matters. The 80% rise was driven mainly by global wholesale gas prices, a supply-side shock that the UK government cannot control. Methods that only redistribute the cost, such as the price cap paid for by the taxpayer, protect households in the short run but do not reduce the underlying cost of energy, so they are only a temporary solution. The magnitude of support also matters: with average bills of £3 549, small grants would cover only a fraction of the increase. The effectiveness also depends on the type of tariff and household: pre-payment meters are more expensive, so vulnerable households may need extra protection. In the long run, the best solution is to increase supply by developing other sources of gas supply and renewable energy, and to improve home insulation, which permanently reduces demand.



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In conclusion, in the short run a price cap combined with targeted direct support is the most effective way to control household energy bills quickly, while competition policy and information help at the margin. However, there is a risk of government failure and the cost is very high, so a combination of policies is required, with long-run investment in energy supply and efficiency as the priority.

Question 8

Road transport creates a negative externality: carbon emissions are an external cost on third parties, contributing to climate change. A petrol car journey from London to Glasgow emits about 3.3 times more carbon dioxide per passenger than the same trip by train. Because drivers only consider their marginal private costs, car journeys are over-consumed. The first method is indirect taxation, such as fuel duty on petrol and diesel or taxes on new car sales. My diagram shows that without intervention the market is at Qm, where MPC = MPB, above the socially optimal Qs, creating a welfare loss. A tax equal to the external cost raises the private cost of driving, shifting MPC up to MSC, so the price rises from Pm to Ps and the number of journeys falls to Qs, removing the welfare loss. This internalises the externality and raises revenue that can be spent on public transport. A second method is subsidies, both on public transport, which lowers train and bus fares and encourages switching from cars, and on electric vehicles and charging points, which lowers their price. A third method is regulation, such as the ban on the sale of new petrol and diesel cars, vehicle emissions checks, road pricing schemes such as congestion charges and low emission zones, and road tax incentives for low carbon vehicles. The government can also improve public transport infrastructure, promote cycle lanes, car sharing and bus only lanes, use incentives for working from home, extend an emissions trading scheme to

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road transport, and use education and information schemes to nudge behaviour.

However, the effectiveness of a tax depends on the price elasticity of demand. Demand for petrol is price inelastic, as many people, especially in rural areas, have no close substitute, so a tax leads to only a small fall in car use while it is regressive, hitting low income households hardest. It is also difficult to measure the external cost precisely, so the tax may be set at the wrong level, causing government failure.

Subsidies have a large opportunity cost and may not work if public transport is a weak substitute (low XED), for example if trains are unreliable or expensive. Electric vehicle subsidies have problems too: the manufacturing of batteries creates emissions, charging infrastructure is poor and electricity may still come from fossil fuels. Regulation faces administration and enforcement costs, and a ban has long time lags, as existing petrol cars stay on the road for many years. Congestion charges only cover small areas, and drivers may simply take other routes.

Road pricing and low emission zones can be well targeted, as charges apply at the times and places where emissions and congestion are highest, but they require expensive cameras and administration, and may simply push traffic onto other roads. Emissions trading for road transport would set a cap on total carbon emissions, giving certainty about the outcome, but the price of permits could be very volatile and hard to monitor for millions of individual drivers.

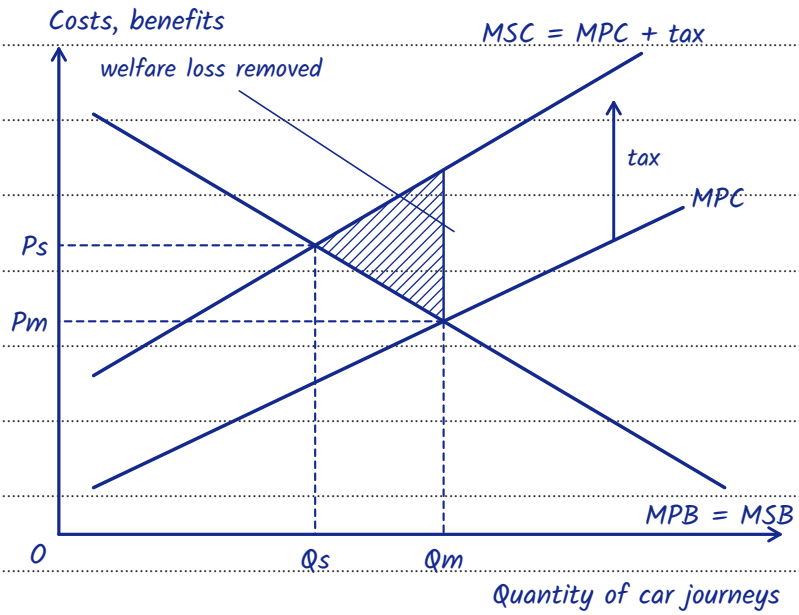
The effectiveness of methods also depends on the stakeholder. Commuters in cities such as London have good public transport, so subsidies and congestion charges can lead to large switching from car to train, given that a train journey emits about 3.3 times less carbon per passenger. However, households in rural areas have few alternatives, so the same policies mainly raise their costs without reducing emissions much, which may cause political resistance and pressure on the government to reverse the policy.

There are also behavioural issues: habits are strong, so drivers may ignore information

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campaigns. In the short run, policies such as fuel duty and congestion charges reduce emissions only slightly, while in the long run, investment in public transport and the switch to electric vehicles can cause large reductions. Policies also need to be prioritised against other aims, such as keeping living costs down.

In conclusion, no single method is enough. Because demand for car travel is price inelastic, taxation alone is unlikely to reduce emissions significantly. A combination of policies is required: taxes and road pricing to correct the price signal, subsidies and investment to make public transport and electric vehicles strong substitutes, and regulation such as the petrol car ban to guarantee the long-run outcome.



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