Please check the examination details below before entering your candidate information

Candidate surname: StemUp Model Solution

Other names:

Centre Number | Candidate Number

Pearson Edexcel International Advanced Level

Thursday 24 October 2024

Afternoon (Time: 2 hours)

Paper reference **WEC13/01**

Economics

International Advanced Level
UNIT 3: Business behaviour

You must have:
Source Booklet (enclosed)

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **ALL** questions in Section A and Section B.
- Answer **TWO** questions in 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 80.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Calculators may be used.

Advice

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

Turn over ▶

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SECTION A

Answer ALL questions in this section.

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

1 A pineapple producer in Costa Rica, operating in a perfectly competitive market, is currently making supernormal profits.

Which **one** of the following is the most likely outcome in the long-run?

- ☒ **A** The producer will make more supernormal profit
- ☒ **B** The producer's output will decrease but industry output will increase
- ☒ **C** The producer will leave the market
- ☒ **D** The market concentration will increase

(Total for Question 1 = 1 mark)

2 In 2023 Cineworld sold tickets for standard seats to watch movies at £9.99 in the UK. Students only paid £7.99 for the same seats.

Which **one** of the following best describes this pricing strategy?

- ☒ **A** Marginal cost pricing
- ☒ **B** Limit pricing
- ☒ **C** Price discrimination
- ☒ **D** Predatory pricing

(Total for Question 2 = 1 mark)

3 In 2023 the Government of the Philippines introduced a maximum price for rice of 41 pesos ($0.72) per kilogram.

Ceteris paribus, which **one** of the following is the most likely impact of the introduction of this maximum price for rice on producers?

- ☒ **A** Producer surplus will increase
- ☒ **B** Fixed costs will decrease
- ☒ **C** Dynamic efficiency will increase
- ☒ **D** Average revenue will decrease

(Total for Question 3 = 1 mark)

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4 The table shows the total costs of a clothing manufacturer producing jeans at different levels of output.

Output	Total costs $
0	40 000
10 000	60 000
20 000	100 000
30 000	160 000
40 000	240 000

What is the average fixed cost per unit if the firm produces 20 000 pairs of jeans?

- [x] **A** $2 *AFC = 40 000 ÷ 20 000 = $2*
- [ ] **B** $3
- [ ] **C** $4
- [ ] **D** $5

(Total for Question 4 = 1 mark)

5 In 2002 the elasticity of demand for agricultural labour in South Africa was estimated to be –1.32.

Which **one** of the following is most likely to influence the elasticity of demand for agricultural labour?

- [x] **A** The cost of capital required for farming relative to the cost of agricultural labour
- [ ] **B** The level of educational qualifications required to be an agricultural worker
- [ ] **C** The location of agricultural jobs in South Africa
- [ ] **D** The occupational and the geographical mobility of labour

(Total for Question 5 = 1 mark)

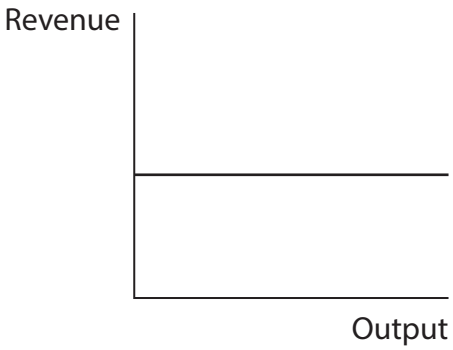
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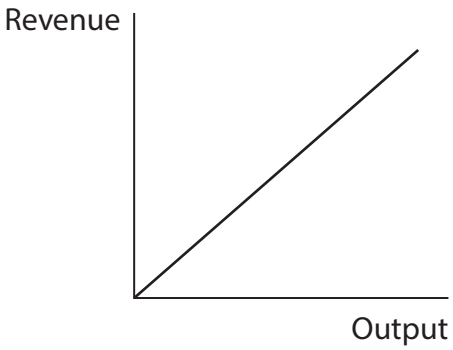
6 In October 2023 Apple's market share of the smartphone market in the USA was 56.41%. It faces a downward sloping demand curve.

Which **one** of the following diagrams would illustrate Apple's total revenue curve?

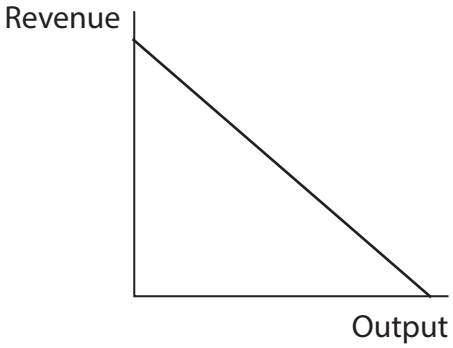
☒ **A**



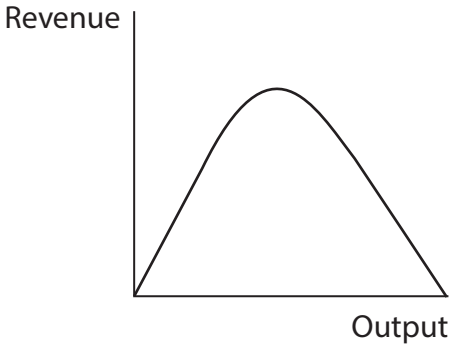
☒ **B**



☒ **C**



☒ **D**



(Total for Question 6 = 1 mark)

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SECTION B STARTS ON THE NEXT PAGE

SECTION B

Study Figures 1 and 2 and Extracts A, B and C in the Source Booklet before answering Question 7. Write your answers in the space provided on the following pages.

7 (a) With reference to Figure 2, calculate the change in AstraZeneca's total costs between 2021 and 2022.

You are advised to show your workings.

(2)

(b) With reference to Extract B line 14, explain the term 'dynamic efficiency'.

(4)

(c) With reference to Extract A, analyse **two** ways that pharmaceutical companies may benefit from external economies of scale.

(6)

(d) With reference to the last paragraph of Extract B, examine the impact of the increase in fixed costs on AstraZeneca's profit.

Illustrate your answer with an appropriate diagram(s).

(8)

(e) With reference to the information provided and your own knowledge, discuss the likely barriers that might prevent a new company from entering the pharmaceutical industry.

(14)

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7 (a) With reference to Figure 2, calculate the change in AstraZeneca's total costs between 2021 and 2022.

You are advised to show your workings.

(2)

Total costs = total revenue – profit

2021: $36 541m – $1 056m = $35 485m 2022: $42 998m – $3 757m = $39 241m

Change = $39 241m – $35 485m = an increase of $3 756m

(Percentage change = 3 756 ÷ 35 485 × 100 = 10.58% increase)

(b) With reference to Extract B line 14, explain the term 'dynamic efficiency'.

(4)

Dynamic efficiency is achieved over time, in the long run, when a firm invests in research and development and new technology to develop new or better products and cheaper methods of production. This improves productivity and causes long-run average costs to fall.

AstraZeneca has a good reputation for R&D: in 2022 it invested $9.8 billion in R&D, which allowed it to develop three new medicines, and it plans to invest $400 million in building a new factory in Dublin.

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(c) With reference to Extract A, analyse **two** ways that pharmaceutical companies may benefit from external economies of scale.

(6)

External economies of scale are falls in long-run average costs that a firm gains because the industry as a whole grows or is concentrated in one area, rather than because the firm itself grows.

1. A skilled workforce. Over 85 pharmaceutical companies operate in Ireland and they employ about 30 000 highly skilled workers. Universities make sure students leave with the skills needed to work in the pharmaceutical industry. Because there is a large local pool of workers with specialised knowledge, firms can recruit trained workers easily, so they spend less on recruitment and training. This lowers average costs and raises productivity, which increases profit.

2. Shared research and development and better infrastructure. There are many research partnerships between businesses and universities that share R&D costs. Locating close to other firms and universities makes it easier to share research facilities and knowledge, so each firm pays less for the very expensive process of developing new medicines and average costs fall. In addition, the Government of Ireland has invested heavily in roads and railways, with a further €35 billion planned for the transport system from 2021. This reduces transport times and costs for supplies and finished medicines and improves the mobility of labour, lowering costs for every firm in the industry.

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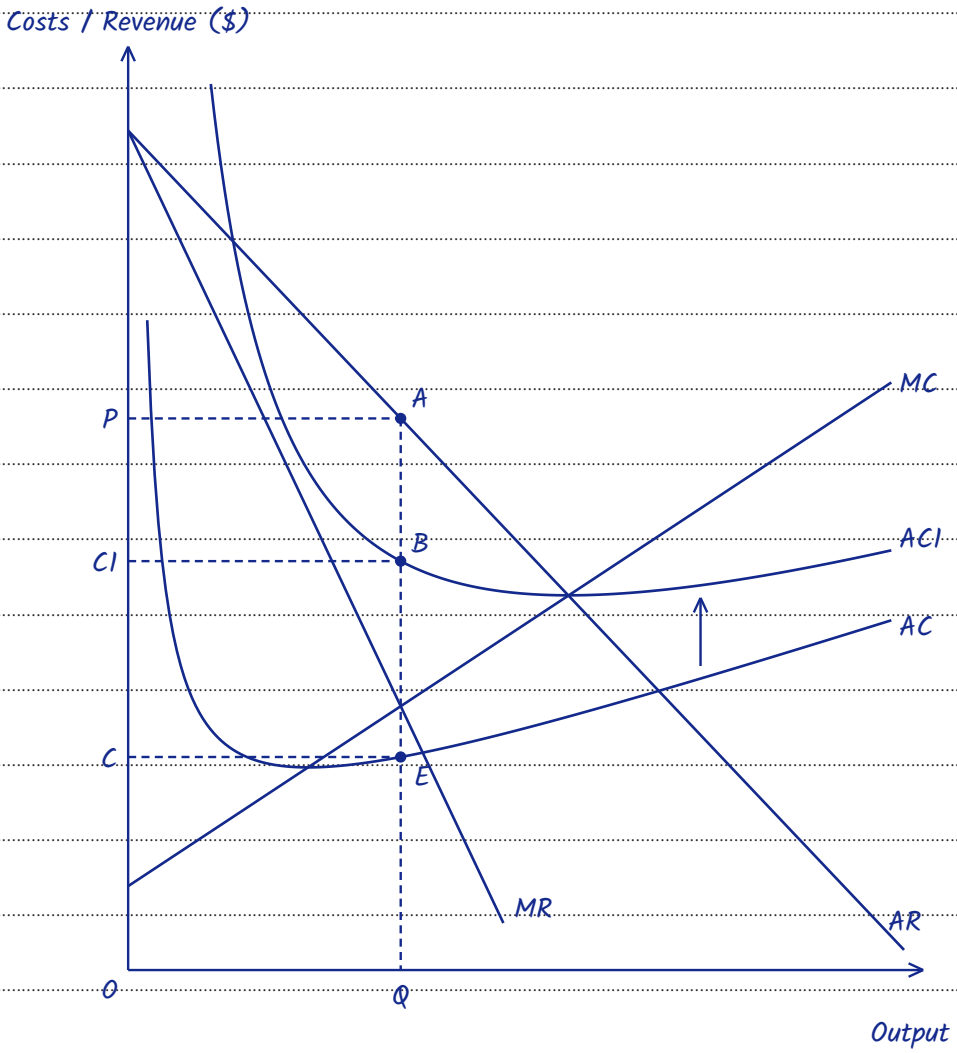
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(d) With reference to the last paragraph of Extract B, examine the impact of the increase in fixed costs on AstraZeneca's profit.

Illustrate your answer with an appropriate diagram(s).

(8)



Extract B states that all pharmaceuticals must undergo clinical trials before they can be approved, and that the fixed costs of complying with these complex regulations have increased significantly. Fixed costs do not vary with output, so only average cost rises, from AC to ACI, while MC does not change.

AstraZeneca maximises profit where MR = MC, at output Q and price P. Because MC and MR have not changed, the profit maximising price and output stay the same. Originally supernormal profit is the area PAEC. After the increase in fixed costs, average cost at Q rises from C to CI,

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so supernormal profit falls to the smaller area PAB CI. If AC rose above P, the firm would make a loss in the short run.

However, the fall in profit depends on how large the regulation costs are as a proportion of total costs; with total costs of about $39 billion in 2022, the effect may be small. The higher costs could also be offset by cost savings from external economies of scale and the lower costs of the new Dublin factory, and if revenue keeps rising through higher sales, as it did from $36 541m to $42 998m, profit may not fall. In the long run the company may also adapt and find ways to reduce these costs.

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(e) With reference to the information provided and your own knowledge, discuss the likely barriers that might prevent a new company from entering the pharmaceutical industry.

(14)

Barriers to entry are factors that make it difficult or expensive for a new company to enter an industry and compete profitably with the existing firms. High barriers protect the market power and supernormal profits of the incumbents in the long run.

First, research and development costs are extremely high. Extract C says a business might spend up to 25% of its revenue on R&D; in 2022 Johnson & Johnson spent $14.6 billion, Roche $14.8 billion and AstraZeneca $9.8 billion. A new company would need huge amounts of finance before it could sell a single medicine, and this spending is risky because there is no guarantee of a breakthrough. R&D is a sunk cost that cannot be recovered if the firm fails, so the risk of entry is very high and banks and investors may be unwilling to lend to new firms.

Second, patents give legal protection. In the European Union patents can last for up to 20 years, so the existing firms have a legal monopoly over their medicines. A new company cannot copy these products and must develop its own, which takes many years, so the incumbents can keep prices and profits high without facing competition.

Third, regulation. All pharmaceuticals must undergo clinical trials before they are approved and the regulatory environment is complex, with the fixed costs of complying increasing significantly. A large firm can spread these fixed costs over a high output, but a new entrant producing a small output faces much higher average costs.

Fourth, economies of scale and the size of incumbents. Figure 1 shows that the largest firms are huge, with Pfizer earning global revenue of $100.30 billion in 2022. These firms gain technical,

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purchasing and financial economies of scale and have well-developed distribution networks to hospitals, so they can produce at a lower average cost. They could use limit pricing, setting a price below a new entrant's average cost, to deter entry. The 1 733 mergers and acquisitions in 2022 also mean firms are getting larger and may simply buy any successful new competitor.

However, these barriers may not be as strong as they appear. Over 85 pharmaceutical companies operate in Ireland, which suggests that entry is possible and the industry is fairly contestable. Extract B says brand loyalty is low and a low pricing strategy is critical to attract consumers, so a new firm with a cheaper medicine, for example a generic version of a drug whose patent has expired, could win customers. Patents do not last forever, so barriers fall over time.

In addition, a new company does not have to do all its R&D alone. It could collaborate with existing pharmaceutical firms or join research partnerships with universities, as in Ireland, which share R&D costs. Ireland's low corporation tax of 12.5% and fast approval of new products by its regulatory authority also reduce the costs of entry. Finally, a large multinational from another industry, such as a technology firm, might diversify into pharmaceuticals because it already has the finance.

Overall, the barriers to entry are high for a small new company, mainly because of the high sunk costs of R&D, patents and the cost of regulation, which together create a long and risky route to market. The most significant barrier is likely to be R&D costs, because finance cannot be raised without a guaranteed product. However, the barriers depend on the type of entrant: a well-funded multinational, or a firm making generic medicines after patents expire, could enter successfully, so the barriers are strongest for new firms developing original medicines.

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(Total for Question 7 = 34 marks)

TOTAL FOR SECTION B = 34 MARKS

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SECTION C STARTS ON THE NEXT PAGE

SECTION C

Answer TWO questions from this section.

8 In October 2023, Lidl was the fastest-growing supermarket by revenue in the UK. The business opened 25 new stores in 2023 and plans to open a further 50 by 2025.

Evaluate the benefits of organic growth to a business such as Lidl.

Illustrate your answer with an appropriate diagram(s).

(Total for Question 8 = 20 marks)

9 In 2023 the Government of Mexico intervened in the country's labour market by:

- increasing the daily minimum wage by 20% to 207.44 pesos
- setting a maximum of 48 hours per week for a full-time employee.

Evaluate the economic benefits of government intervention in labour markets.

Illustrate your answer with an appropriate diagram(s).

(Total for Question 9 = 20 marks)

10 In 2022 the South Korean competition authority fined 15 shipping companies $63 million. These companies were found guilty of fixing prices by colluding.

Evaluate the benefits of collusion in a market of your choice.

Illustrate your answer with a simple game theory model.

(Total for Question 10 = 20 marks)

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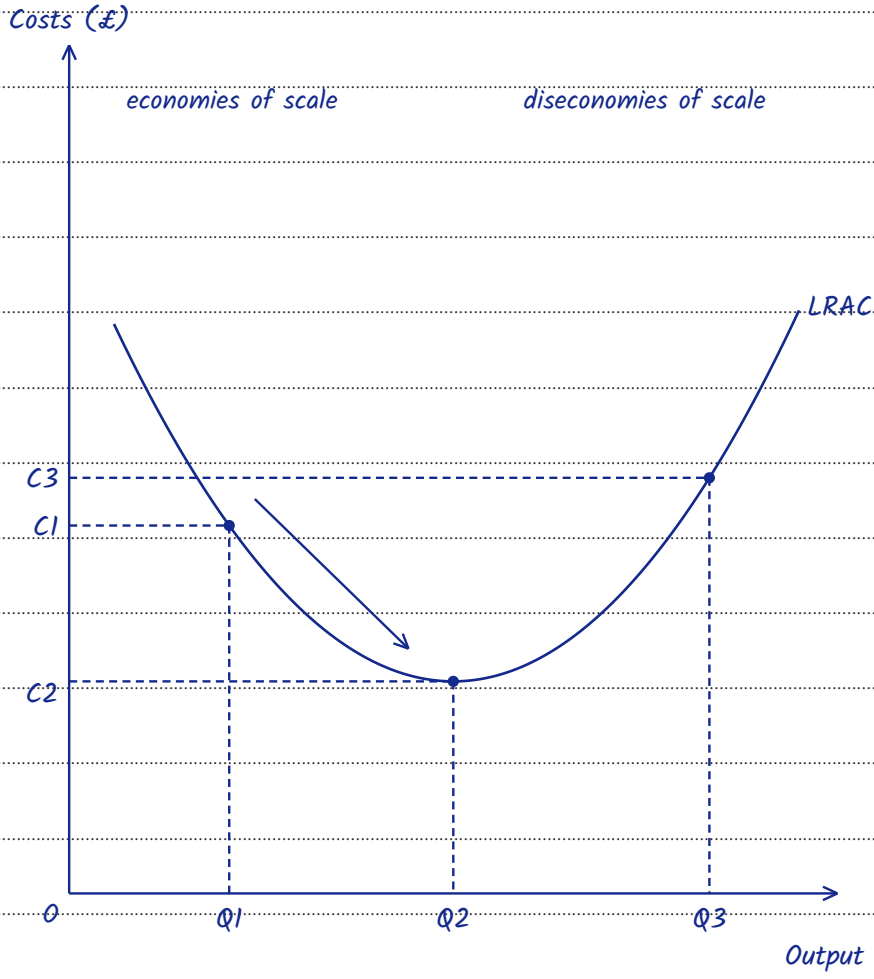
Indicate which question you are answering by marking a cross in the box ☒. If you change your mind, put a line through the box ☒ and then indicate your new question with a cross ☒.

Write the answer to your SECOND chosen question on page 22.

Chosen question number: **Question 8** ☒ **Question 9** ☐ **Question 10** ☐

Organic growth is when a business expands internally, using its own resources, for example by increasing sales, opening new stores or launching new products, rather than through a merger or takeover. Lidl is growing organically: in October 2023 it was the fastest-growing supermarket by revenue in the UK, it opened 25 new stores in 2023 and plans to open a further 50 by 2025.

1. Economies of scale. As Lidl opens more stores and sells a higher output, it can benefit from internal economies of scale, so long-run average costs fall. This is shown in the diagram.



When Lidl increases output from Q1 to Q2, long-run average cost falls from C1 to C2. Buying

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much larger quantities of stock for more stores gives Lidl purchasing economies, because it has greater bargaining power with suppliers and can negotiate lower prices per unit. It can also spread the cost of advertising, distribution centres and IT systems over more stores (marketing and technical economies). Lower average costs mean Lidl can keep its prices low, which is central to its discount strategy, and still increase its profit margin, so it becomes more productively efficient.

2. Higher revenue and profits that do not have to be shared. Opening new stores in new areas increases demand for Lidl's products, shifting its AR and MR curves to the right. At the profit maximising output, where MR = MC, Lidl sells more, so total revenue and supernormal profit increase. Because it has not merged with or taken over another business, Lidl keeps all of these extra profits for itself, and these can be reinvested to fund further store openings, so growth can become self-financing.

3. Retaining control, culture and lower risk. Organic growth lets Lidl keep complete control of its business model, such as a limited range of mainly own-brand products and simple store layouts. There is no need to combine two different management teams and cultures, as there would be in a merger, so there are fewer disagreements between managers and less risk of the clash of cultures that makes many takeovers fail. Growth also builds on Lidl's existing strengths and brand, so it is more stable, and it avoids the very large up-front cost of buying another supermarket chain.

4. Market share and competition authorities. As Lidl gains market share it gains market power, so it has more ability to set prices and to negotiate with suppliers, increasing profits that allow further investment. Organic growth is also less likely to attract the attention of the Competition and Markets Authority, which investigates mergers that would create a large market share; for

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example a merger between two large UK supermarkets could be blocked. Growth also creates new jobs and promotion opportunities for Lidl's existing staff, which can improve motivation.

However, organic growth also has drawbacks, so its benefits may be limited. First, it is slow. Lidl will take about two years to open another 50 stores, whereas buying an existing chain would give it hundreds of stores immediately. Competitors such as Aldi are also expanding, so Lidl may not be able to gain market share quickly enough, and in the meantime rivals may respond by cutting prices, which would reduce the gains in revenue.

Second, finance may be limited. If Lidl relies only on its retained profits, the speed and scale of expansion are constrained, and buying land and building new stores can be much more expensive than acquiring established stores through a takeover. If Lidl borrows to finance the stores, it faces interest costs, and if sales in the new stores are lower than expected, the investment may not be profitable. Each new location also requires market research, new supply routes and staff, and Lidl may lack local knowledge, which a takeover of an established firm would provide.

Third, if Lidl grows too large it may suffer diseconomies of scale. In the diagram, if output rises beyond Q2 to Q3, long-run average cost rises from C2 to C3. With many more stores, communication and coordination between head office and store managers becomes harder and staff may feel less motivated, so costs per unit rise and the benefit of growth is reduced. The size of the benefit therefore depends on whether Lidl is still below its minimum efficient scale. As a large multinational that operates in many countries, Lidl may already be gaining most of the available purchasing economies, so the cost savings from 75 extra UK stores may be relatively small.

In conclusion, organic growth brings significant benefits to Lidl: lower average costs that support

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its low-price strategy, extra profits it does not have to share, and full control with lower risk than a merger. These benefits are likely to be large for Lidl because it is a discount retailer whose success depends on cost advantages, and it can finance store openings from strong revenue growth. However, the benefits are gradual and depend on Lidl managing its growth carefully to avoid diseconomies of scale. On balance, for a firm with a successful and distinctive business model, the benefits of steady organic growth outweigh its slower pace.

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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 8** ☐ **Question 9** ☐ **Question 10** ☒

Collusion is when firms agree to cooperate, instead of competing, in order to restrict competition, for example by fixing prices, limiting output or sharing out the market. It is most likely in an oligopoly, where a few large interdependent firms dominate the market. A market of my choice is the international shipping market, where in 2022 the South Korean competition authority fined 15 shipping companies $63 million for fixing prices by colluding.

Game theory shows why firms benefit from colluding. Suppose two shipping companies, Firm A and Firm B, each choose to charge a high or a low freight price. The payoff matrix shows their profits ($m), with Firm A's profit first:

		Firm B	
		High price	Low price
Firm A:	High price	$50m, $50m	$20m, $70m
Firm A:	Low price	$70m, $20m	$30m, $30m

Without collusion, each firm has a dominant strategy to charge a low price. If B charges a high price, A earns $70m by going low rather than $50m; if B charges a low price, A earns $30m by going low rather than $20m. The same is true for B, so the Nash equilibrium is low price, low price, with $30m each. This is the prisoners' dilemma, because both would be better off

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charging a high price. By colluding and agreeing to fix a high price, they move to high price, high price, and each firm's profit rises from $30m to $50m, so joint profit rises from $60m to $100m.

1. Higher profits. Colluding firms act like a joint monopolist: they restrict capacity and set the price where joint MR = MC, so prices are well above the competitive level. Because demand for shipping is fairly price inelastic, as exporters have few alternatives for moving goods across the world, the shipping companies' revenue and supernormal profits increase.

2. Stability and predictability. By agreeing prices and capacity, the firms remove the risk of a price war, which is common in shipping when there is excess capacity. Stable prices make it easier for the firms to budget and plan investment in very expensive ships, and also help their customers to plan their transport costs.

3. Cost savings and innovation. Firms may cooperate by sharing vessels, ports and routes, which reduces costs, and these savings could be passed on to consumers. The higher profits also give the firms the funds to invest in research and development, such as cleaner, more fuel-efficient ships, increasing dynamic efficiency.

4. Barriers to entry. Acting together, the established firms can deter new entrants, for example by threatening to cut prices on any route a new firm enters. This protects their market share and allows them to keep earning supernormal profits in the long run.

However, collusion is illegal, so these benefits carry high risks. The 15 shipping companies were fined $63 million, which increases their costs and may wipe out some of the extra profit, and their reputation with customers is damaged. Leniency schemes, where the first firm to report

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the cartel avoids a fine, make discovery more likely.

Collusive agreements are also unstable. The payoff matrix shows that each firm can raise its profit from $50m to $70m by secretly cutting its price, so there is a strong incentive to cheat. With 15 companies involved, it is hard to monitor whether every firm keeps to the agreed price, so the agreement may break down into a price war and the benefits may only last in the short run.

The benefits go mainly to the producers, not to consumers or the economy. Higher freight prices reduce consumer surplus and transfer it to producers, and restricted output creates a deadweight loss, so the market is allocatively inefficient. Exporters and importers face higher costs, which may be passed on as higher prices for goods. Without competitive pressure, the firms have less incentive to cut costs, so X-inefficiency may rise, and there is no guarantee that the extra profits will be spent on innovation rather than paid to shareholders. Consumers also have less choice.

In conclusion, collusion clearly benefits the colluding firms through higher and more stable profits, as the move from $30m to $50m each in the game shows. However, these benefits are likely to be short-lived, because cartels are unstable when there are many firms and face large fines once discovered, as the $63 million fine shows. The benefits to the wider economy are small, as consumers pay higher prices and efficiency falls, so only limited cooperation, such as sharing ships or research, is likely to be beneficial overall.

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TOTAL FOR PAPER = 80 MARKS

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Thursday 24 October 2024

Afternoon (Time: 2 hours)

Paper reference **WEC13/01**

Economics

International Advanced Level

UNIT 3: Business behaviour

Source Booklet

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Sources for use with Section B

The pharmaceutical industry

Figure 1 Largest pharmaceutical companies in Ireland, based on global revenue, $ billion, 2022

Rank	Company	Global revenue ($bn)
1	Pfizer	100.30
2	Roche	69.77
3	Merck & Co	59.28
4	AbbVie	58.05
5	Bayer	53.88
6	Johnson & Johnson	52.60

Figure 2 AstraZeneca's total global revenue and profit, $ million, 2021 and 2022

	2021 ($m)	2022 ($m)
Total revenue	36 541	42 998
Profit	1 056	3 757

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Extract A The pharmaceutical industry in Ireland

Many large pharmaceutical companies have chosen to establish themselves in Ireland. The most important reason is the country's low rate of corporation tax which is set at 12.5% compared to 21% in the USA and 25% in the UK. Another reason for locating in Ireland is the speed at which new products are approved by Ireland's pharmaceutical regulatory authority.

Over 85 pharmaceutical companies operate in Ireland, enabling businesses located there to benefit from external economies of scale. These companies employ approximately 30 000 highly skilled workers. The Government of Ireland has invested heavily in improving roads and railways. In 2021 it announced plans for a further €35 billion investment into the country's transport system. There are many research partnerships between businesses and universities that share research and development (R&D) costs. These universities also help to ensure that students leave with the skills required to work in the pharmaceutical industry.

Extract B AstraZeneca

AstraZeneca is a UK-Swedish owned multinational pharmaceutical company that operates in over 100 countries around the world. In 2022 it was the tenth largest global pharmaceutical company, producing high quality medical equipment and pharmaceuticals for hospitals.

AstraZeneca has a good reputation for R&D. In 2022 it invested $9.8 billion in R&D. This enabled it to:

- develop three new medicines
- continue research on medical advancements
- improve productive efficiency.

In 2023 AstraZeneca announced plans to invest $400 million in building a new factory in Dublin, Ireland. This was a change from its previous plan to open a new factory in the UK. The company stated that it needed to reduce costs to be price competitive. At the same time this investment was necessary for the company to achieve dynamic efficiency.

One of the biggest problems facing AstraZeneca is the cost and time involved in producing new medicines. Also, the regulatory environment is complex because all pharmaceuticals must undergo clinical trials before medicines can be approved. The fixed costs associated with complying with these regulations have increased significantly. A low pricing strategy is critical to attract consumers because brand loyalty is low.

Extract C The global pharmaceutical industry

Although there are many companies in the pharmaceutical industry, they all own patents for their products. In the European Union these can last for up to 20 years. A business in this industry might spend up to 25% of its revenue on R&D. In 2022 Johnson & Johnson spent $14.6 billion, Roche spent $14.8 billion and AstraZeneca spent $9.8 billion. This investment is risky because there is no guarantee of medical breakthroughs. Consequently, there are many mergers and frequent collaborations between pharmaceutical companies. For example, in 2022 there were 1 733 mergers and acquisitions in the industry.

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Acknowledgements

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