ECO.MIC6 Costs of Production and Economies and Diseconomies of Scale

Total Marks

AQA 7136 · Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer all questions. Use full sentences for all explain, assess and evaluate questions. Time guidance: 60 minutes total; allow about 25 minutes for the 25-mark evaluation question plus checking.

1 Multiple choice on short-run cost concepts: in the context of a manufacturing firm, which of the following is categorised as a fixed cost?

- ☐ A Rent on the factory building paid monthly
- ☐ B Wages of factory workers paid per hour
- ☐ C Cost of raw materials used per unit produced
- ☐ D Electricity bill that varies exactly with hourly output

(Total for Question 1 is 1 mark)

2 Define 'fixed cost' as used in short-run cost analysis for a firm producing goods.

(Total for Question 2 is 1 mark)

3 Define 'variable cost' in the context of a firm's short-run production.

(Total for Question 3 is 1 mark)

4 Explain why average fixed cost (AFC) falls as output rises, using the relationship between fixed cost and output for a typical firm.

(Total for Question 4 is 2 marks)

5 Cost table for a small producer. Fixed cost is GBP 40 at all output levels. Variable cost (VC) is given in the table for outputs 1 to 3 units. Calculate the missing columns: average fixed cost (AFC), average variable cost (AVC), average total cost (ATC) and marginal cost (MC). Show working. Table: Output (units): 1, 2, 3. Fixed cost GBP: 40, 40, 40. Variable cost GBP: 30, 50, 70.

(a) Complete the table and give AFC, AVC and ATC for output = 1 unit. **(3)**

(b) Give AFC, AVC and ATC for output = 2 units. **(3)**

(c) Give AFC, AVC and ATC for output = 3 units. **(3)**

(d) Calculate marginal cost (MC) for increasing output from 1 to 2 units, and from 2 to 3 units. **(2)**

(Total for Question 5 is 11 marks)

6 Explain, with reference to marginal cost (MC) and average variable cost (AVC), how the law of diminishing returns in the short run affects the shape of the MC and AVC curves for a firm using more of a variable input with a fixed input.

(Total for Question 6 is 2 marks)

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7 State two internal economies of scale a large manufacturing firm might enjoy as it expands production.

(Total for Question 7 is 2 marks)

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8 Explain how financial economies of scale reduce average costs for a growing firm when it seeks external finance for expansion.

(Total for Question 8 is 2 marks)

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9 Explain marketing economies of scale and give a brief example relevant to a national retailer.

(Total for Question 9 is 2 marks)

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10 Explain risk-bearing economies of scale and how diversification by a larger firm can lower its average costs or risks compared with a small specialised firm.

(Total for Question 10 is 2 marks)

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11 Explain two causes of internal diseconomies of scale that might lead average costs to rise when a firm becomes very large.

(Total for Question 11 is 2 marks)

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12 Long-run average cost (LRAC) diagram question for a firm expanding over time. Draw a LRAC curve showing the typical U-shape with a minimum efficient scale (MES) and label the MES. Also sketch three short-run average cost (SRAC) curves tangent to the LRAC at different output levels, and label the point where the smallest SRAC is tangent to LRAC. In the context of the diagram, briefly explain what MES means for a firm deciding its plant size.

Figure (to be drawn): Student must draw LRAC U-shaped curve with a minimum point labelled MES, and three SRAC curves tangent to LRAC at different outputs with the lowest SRAC tangent at MES.

(Total for Question 12 is 4 marks)

13 Context: policymakers sometimes encourage business growth on the grounds that larger firms achieve lower average costs through internal economies of scale. Evaluate whether every firm should therefore aim to grow, considering short-run and long-run cost structures, potential diseconomies of scale, market structure and other objectives firms may have.

Evaluate the view that all firms should aim to grow to minimise average costs and exploit economies of scale.

(Total for Question 13 is 25 marks)

Mark scheme · ECO.MIC6 Costs of Production and Economies and Diseconomies of Scale

Question 1

- **B1** selects A, rent is a fixed cost independent of short-run output
- **Answer: A**

Question 2

- **B1** a cost that does not vary with the level of output in the short run, for example rent or insurance
- **Answer: A cost that does not vary with output in the short run, for example rent or insurance.**

Question 3

- **B1** a cost that changes with the level of output, for example raw materials or piece-rate labour
- **Answer: A cost that changes with the level of output, for example raw materials or piece-rate labour.**

Question 4

- **M1** AFC = fixed cost divided by output, so as output rises the same fixed cost is spread over more units
- **A1** therefore AFC falls continuously as output increases (spreading effect)
- **Answer: AFC = fixed cost/output, so increasing output spreads the fixed cost over more units and AFC falls.**

Question 5

- (a) **M1** AFC = 40 / 1 = 40.0
- (a) **M1** AVC = 30 / 1 = 30.0
- (a) **M1** ATC = (40 + 30) / 1 = 70.0
- **(a) Answer: AFC = 40.0, AVC = 30.0, ATC = 70.0**
- (b) **M1** AFC = 40 / 2 = 20.0
- (b) **M1** AVC = 50 / 2 = 25.0
- (b) **M1** ATC = (40 + 50) / 2 = 45.0
- **(b) Answer: AFC = 20.0, AVC = 25.0, ATC = 45.0**
- (c) **M1** AFC = 40 / 3 = 13.33..., accept 13.3
- (c) **M1** AVC = 70 / 3 = 23.33..., accept 23.3
- (c) **M1** ATC = (40 + 70) / 3 = 36.666..., accept 36.7
- **(c) Answer: AFC = 13.3 (awrt), AVC = 23.3 (awrt), ATC = 36.7 (awrt)**
- (d) **M1** MC 1->2 = change in total cost = (40+50) - (40+30) = 90 - 70 = 20
- (d) **M1** MC 2->3 = (40+70) - (40+50) = 110 - 90 = 20
- **(d) Answer: MC (1->2) = GBP 20.0; MC (2->3) = GBP 20.0**

Question 6

- **M1** diminishing marginal returns cause marginal product to fall as variable input increases with fixed inputs, so MC eventually rises
- **A1** as MC rises it pulls AVC up after its minimum, giving the typical U-shape for MC and AVC (MC falls then rises; AVC falls then rises with MC intersecting AVC at AVC's minimum)
- **Answer: As more of a variable input is used with fixed inputs marginal product falls so MC rises; rising MC pulls up AVC after its minimum, producing the typical U-shaped MC and AVC curves.**

Question 7

- **B1** technical economies, for example more efficient specialist machinery or production techniques
- **B1** managerial economies, for example employing specialist managers which improves efficiency
- **Answer: Technical economies (specialist machinery) and managerial economies (specialist managers).**

Question 8

- **M1** larger firms usually obtain loans at lower interest rates and raise capital more cheaply because they are lower risk and have better access to capital markets
- **A1** this lowers interest and finance costs per unit, reducing average costs as the firm expands
- **Answer: Large firms can borrow more cheaply and access capital markets more easily, lowering per-unit finance costs and reducing average cost.**

Question 9

- **M1** marketing economies arise because advertising and brand-building costs can be spread over a larger output or more stores
- **A1** example: a national retailer runs one national TV campaign that reaches many stores, lowering advertising cost per unit sold
- **Answer: Advertising and brand costs are spread over larger sales; e.g. a national TV ad campaign lowers advertising cost per unit for a national retailer.**

Question 10

- **M1** larger firms can diversify products and markets, spreading the risk of a downturn in any one market across other products or regions
- **A1** this reduces the likelihood of large income swings and can lower the effective average cost of capital or insurance-like expenses
- **Answer: Large firms can diversify products and markets, spreading risk and reducing income volatility and effective per-unit costs associated with risk.**

Question 11

- **M1** coordination problems: management may struggle to coordinate many departments leading to inefficiency
- **A1** communication difficulties: longer chains of command increase delays and mistakes, raising average costs
- **Answer: Coordination problems and communication difficulties in very large firms increase inefficiency and raise average costs.**

Question 12

- **B1** correctly labelled LRAC curve, U-shaped with a clear minimum point labelled MES
- **B1** three SRAC curves drawn and positioned so that each is tangent to LRAC at different outputs
- **B1** lowest SRAC is drawn tangent at the MES point and this tangent point is labelled
- **B1** brief explanation: MES is the lowest output at which long-run average costs are minimised, so plant size chosen at MES yields minimum average cost
- **Answer: Diagram with U-shaped LRAC and three tangent SRACs; MES labelled at LRAC minimum. MES is the lowest output where LRAC is minimised, guiding the efficient plant size choice.**

Question 13

- **Level 1** (1-5): Basic assertions about growth and lower average cost with little or no development or supporting analysis. Limited reference to economies or diseconomies of scale. Judgement, if present, is unsupported or superficial.
- **Level 2** (6-10): Some relevant analysis, identifying economies of scale and that growth can reduce average cost. Some consideration of diseconomies or practical limits, but analysis is partial and lacks depth or clear evaluation. Limited use of examples or theory.
- **Level 3** (11-15): Clear analysis of how internal economies of scale lower average costs and how diseconomies of scale can raise costs, with discussion of MES and plant size. Considers short-run versus long-run and introduces market-structure implications. Argument demonstrates awareness of trade-offs but limited judgement or nuance.
- **Level 4** (16-20): Detailed analysis including diagrams as appropriate, evaluation of conditions under which growth reduces costs, and development of counterarguments such as diseconomies, management limits, and alternative firm objectives. Considers variation by industry, stage of industry life-cycle and external economies. A reasoned provisional judgement is presented.
- **Level 5** (21-25): Comprehensive and balanced evaluation. Strong analysis of economies and diseconomies of scale, clear use of LRAC/MES and short-run SRAC tangency, and consideration of distributional, market-structure and strategic factors. Weighs benefits of growth against costs, non-cost objectives (e.g. flexibility, niche strategy), and provides a well-supported concluding judgement that distinguishes between firm types and circumstances.
- **Indicative content:**
  - Explain how internal economies of scale (technical, managerial, financial, marketing, risk-bearing) reduce long-run average costs as firms grow
  - Use LRAC and SRAC reasoning: as firms move along LRAC they can choose larger plant sizes until MES is reached, lowering ATC
  - Consider that MES may occur at different output levels across industries, so not all firms need to become large to reach minimum cost
  - Discuss diseconomies of scale arising from coordination problems, communication costs and managerial inefficiencies that can increase average costs beyond a certain size
  - Evaluate short-run constraints: firms may be operating with excess capacity or face high adjustment costs to expand plant, so growth is not always immediately cost-minimising
  - Consider market-structure implications: in some markets, small firms may survive by specialising or differentiating, avoiding scale-based competition
  - Non-cost objectives: firms may prioritise flexibility, control, quality or niche service which favour remaining small
  - Consider external economies and public policy: in some clusters, external economies mean many firms benefit without growing large, altering incentives
  - Weigh up strategic reasons to grow even if short-term average cost improvements are small (market power, access to finance) against risks (diseconomies, regulatory scrutiny)
  - Conclude with a balanced judgement: growth can minimise costs for many firms, but it is not universally desirable; decision depends on industry MES, managerial capacity, strategic objectives and the potential for diseconomies