

Cambridge IGCSE — Economics (0455)

Paper 2 Structured Questions — Answers and Marking Notes

Time allowed: 2 hours 15 minutes	Total: 100 marks	6 questions
Answer all questions.	TutorZone extended practice paper	Not a Cambridge paper

Show all working and give units with numerical answers; answers without working may not receive full marks. Calculators may be used.

1. A country uses all its resources to produce rice and cloth. Four combinations on its production possibility curve are: **[24]**

Combination A: 0 m of cloth, 800 kg of rice

Combination B: 200 m of cloth, 700 kg of rice

Combination C: 350 m of cloth, 500 kg of rice

Combination D: 450 m of cloth, 250 kg of rice

(a) Calculate the opportunity cost, in kg of rice, of each extra metre of cloth when moving from A to B, from B to C and from C to D. (6 marks)

(b) Explain why this opportunity cost rises as cloth output increases, and state the shape of the production possibility curve. (4 marks)

(c) The price of rice rises from \$2.50 to \$2.75 per kg and quantity demanded falls from 1,000 tonnes to 960 tonnes. Calculate the price elasticity of demand (PED) and state whether demand is elastic or inelastic. (5 marks)

(d) Calculate total revenue before and after the price rise and use your PED to explain the change. (4 marks)

(e) The government has a budget of \$40 million and can build either a hospital or a section of motorway. Using the concept of opportunity cost, discuss whether the hospital should be built. (5 marks)

Answer 1 (24 marks)

(a) A to B: rice falls from 800 kg to 700 kg (a loss of 100 kg) while cloth rises from 0 m to 200 m, so the opportunity cost is $100 / 200 = 0.50$ kg of rice per metre.

B to C: a loss of 200 kg of rice for 150 m of cloth, i.e. $200 / 150 = 1.33$ kg per metre.

C to D: a loss of 250 kg of rice for 100 m of cloth, i.e. $250 / 100 = 2.50$ kg per metre.

(b) Factors of production are not perfectly substitutable. The resources moved into cloth first are best suited to weaving, but the more cloth is produced the more the country must use land and labour that are best suited to rice, so more rice is given up: 0.50 then 1.33 then 2.50 kg. The curve is therefore bowed outwards (concave to the origin).

(c) Percentage change in price = $(2.75 - 2.50) / 2.50 = +10.00\%$; percentage change in quantity = $(960 - 1,000) / 1,000 = -4.00\%$. PED = $-4.00 / 10.00 = -0.40$. As the value ignoring the sign (0.40) is less than 1, demand is inelastic.

(d) Before: $2.50 \times 1,000 = 2500.00$. After: $2.75 \times 960 = 2640.00$, a rise of 140.00 (+5.60%).

Because demand is inelastic the fall in quantity (4.00%) is smaller than the rise in price (10.00%), so total revenue rises.

(e) The opportunity cost of the hospital is the motorway section that is given up, including the journey time it would have saved. For the hospital: the social benefit of health care (lives saved, control of infectious disease) is hard to value in a market and may exceed that of the road. Against: if the road cuts commuting and freight costs for many firms, its marginal contribution to productivity may be larger. The decision should compare marginal social benefits: with a fixed \$40 million budget the money should go where the marginal benefit is higher, and the cost of the alternative forgone must be stated.

Marking notes: (a) 2 marks per combination (1 for the working, 1 for the answer with units); (b) 2 marks for non-substitutable resources, 2 for increasing opportunity cost and the shape; (c) 1.5 marks per percentage change, 2 marks for the PED value and the judgement; (d) 1 mark per total revenue and 2 for the explanation; (e) 2 marks for defining opportunity cost, 1 per side and 1 for the conclusion.

2. In a market $Q_d = 1,500 - 50P$ and $Q_s = 300 + 25P$, where Q is in thousands of units and P is in dollars. **[20]**

(a) Calculate the equilibrium price and quantity. (5 marks)

(b) Calculate the price elasticity of demand and the price elasticity of supply at equilibrium and state the type of elasticity in each case. (5 marks)

(c) The government imposes a specific tax of \$6 per unit on producers. Calculate the new equilibrium price and quantity, the total tax revenue, and the amount of tax borne by consumers and by producers. (6 marks)

(d) Calculate the deadweight loss caused by the tax. (4 marks)

Answer 2 (20 marks)

(a) Setting $Q_d = Q_s$: $1,500 - 50P = 300 + 25P$, so $1,200 = 75P$ and $P = 16.00$. $Q = 1,500 - 50 \times 16.00 = 700.0$ thousand units (700,000 units).

(b) $PED = (dQ/dP) \times (P/Q) = -50 \times 16.00 / 700.0 = -1.14$. Ignoring the sign the value exceeds 1, so demand is elastic.

$PES = 25 \times 16.00 / 700.0 = 0.57$, which is below 1, so supply is inelastic.

(c) With the tax the supply curve becomes $Q_s = 300 + 25(P - 6) = 150 + 25P$.

$1,500 - 50P = 150 + 25P$ gives $1,350 = 75P$, so $P = 18.00$ and $Q = 600.0$ thousand units.

Tax revenue = $\$6 \times 600,000$ units = $\$3,600,000$.

Consumers bear $(\$18 - \$16) \times 600,000 = \$1,200,000$; producers bear $(\$16 - \$12) \times 600,000 = \$2,400,000$.

(d) Deadweight loss = $0.5 \times \$6 \times (700 - 600)$ thousand units = $0.5 \times 6 \times 100,000 = \$300,000$.

Marking notes: (a) 2 marks for equating, 2 for P and 1 for Q; (b) 2 marks for PED, 2 for PES and 1 for the judgements; (c) 2 marks for the new supply function, 2 for the new price and quantity, 1 for the revenue and 1 for the incidence; (d) 2 marks for the triangle and 2 for the value.

3. A firm has total fixed cost of \$800. When it produces 100 units its total variable cost is \$1,200; **[16]** when output rises to 200 units its total variable cost is \$2,000.

(a) Calculate average fixed cost, average variable cost and average total cost at 100 units and at 200 units. (6 marks)

(b) At a market price of \$24 the firm produces 100 units; when the price falls to \$22 it produces 200 units. Calculate total revenue and profit in each case. (5 marks)

(c) Calculate the marginal cost of raising output from 100 to 200 units and explain why average total cost falls. (5 marks)

Answer 3 (16 marks)

(a) At 100 units: $TC = 800 + 1,200 = 2000$, so $AFC = 800 / 100 = 8.00$, $AVC = 1,200 / 100 = 12.00$ and $ATC = 2000 / 100 = 20.00$.

At 200 units: $TC = 800 + 2,000 = 2800$, so $AFC = 800 / 200 = 4.00$, $AVC = 2,000 / 200 = 10.00$ and $ATC = 2800 / 200 = 14.00$.

(b) At 100 units: $TR = 24 \times 100 = 2400$ and profit = $2400 - 2000 = 400$.

At 200 units: $TR = 22 \times 200 = 4400$ and profit = $4400 - 2800 = 1600$.

(c) $MC = \text{change in } TC / \text{change in } Q = (2800 - 2000) / (200 - 100) = 800 / 100 = 8.0$.

Average total cost falls from 20.00 to 14.00 because the fixed cost of \$800 is spread over more units (AFC falls from 8.00 to 4.00) and average variable cost also falls from 12.00 to 10.00: these are economies of scale.

Whenever MC (8.0) is below ATC, ATC must be falling.

Marking notes: (a) 1 mark per AFC/AVC/ATC set; (b) 1 mark per total revenue and 1.5 per profit; (c) 3 marks for the MC working and value, 2 for spreading fixed cost and economies of scale.

4. A country's nominal GDP was \$520 billion in 2024 and \$572 billion in 2025. Its GDP deflator rose **[16]** from 100 to 104, its population rose from 20.0 million to 20.5 million, its labour force is 25.0 million with 23.5 million employed, and its marginal propensity to consume is 0.8.

(a) Calculate real GDP in 2024 and 2025 and the rate of real economic growth. (6 marks)

(b) Calculate the rate of inflation and real GDP per head in both years. (5 marks)

(c) Calculate the unemployment rate. If government spending rises by \$1.2 billion, calculate the multiplier and the change in aggregate demand (real GDP). (5 marks)

Answer 4 (16 marks)

(a) Real GDP = nominal GDP / (deflator / 100).

2024: $520 / 1.00 = \$5,200.00$ billion; 2025: $572 / 1.04 = \$5,500.00$ billion.

Real growth = $(5,500 - 5,200) / 5,200 \times 100 = 5.77\%$.

(b) Inflation = $(104 - 100) / 100 \times 100 = 4.00\%$.

Real GDP per head: 2024 = $\$520 \text{ billion} / 20.0 \text{ million} = \$26,000$; 2025 = $\$550 \text{ billion} / 20.5 \text{ million} = \$26,829.27$.

(c) Unemployment rate = $(25.0 - 23.5) / 25.0 \times 100 = 6.00\%$.

Multiplier = $1 / (1 - 0.8) = 5.00$, so the change in aggregate demand = $5.00 \times 1.2 = \$60.00$ billion.

Marking notes: (a) 2 marks per real GDP and 2 for the growth rate; (b) 2 marks for inflation and 1.5 per real

GDP per head; (c) 2 marks for unemployment, 1.5 for the multiplier and 1.5 for the change in aggregate demand.

5. A developing country has a population of 50.0 million, a birth rate of 22 per thousand, a death rate [14] of 7 per thousand and net migration of -1 per thousand. The international poverty line is US\$2.15 per person per day. The poorest 20% of the population receive 6% of total income and the richest 20% receive 45%.

(a) Calculate the rate of population growth and the population one year later. (5 marks)

(b) Calculate the annual income per person at the poverty line and explain the difference between absolute and relative poverty. (5 marks)

(c) Use the data to describe the distribution of income and suggest two policies to reduce poverty. (4 marks)

Answer 5 (14 marks)

(a) Population growth = $(22 - 7 - 1) / 1,000 \times 100 = 1.40\%$.

Population after one year = $50.0 \text{ million} \times (1 + 1.40\%) = 5070.00$ million.

(b) Annual income = $2.15 \times 365 = \text{US\$}784.75$.

Absolute poverty means income below a fixed minimum needed for basic survival (food, clean water, shelter), such as the US\$2.15 a day line. Relative poverty means income that is low compared with the normal standard of living in that society (for example below half the median income), even if basic needs can be met.

(c) The richest fifth receive $45 / 6 = 7.5$ times the income of the poorest fifth, so income is very unevenly distributed and GDP per head overstates the living standard of most people.

Policy one: progressive income tax with the revenue used for transfers and a minimum income guarantee, which raises the incomes of the poor directly. Policy two: spending on education, vocational training and rural health care, which raises the skills, productivity and earning power of low-income groups; a minimum wage and rural infrastructure would also widen job opportunities.

Marking notes: (a) 2 marks for the growth rate and 3 for the population; (b) 2 marks for the annual income and 1.5 per definition; (c) 2 marks for the data description and 1 per policy.

6. A country has goods exports of \$48 billion and goods imports of \$62 billion, net services of +\$6 [10] billion, primary income of -\$2 billion and secondary income of +\$2.5 billion. It imposes a 25% tariff on an imported good priced at \$40, and imports fall from 9.0 million units to 7.5 million units. The exchange rate depreciates by 5% from HK\$7.80 per US dollar.

(a) Calculate the balance of trade in goods and the current account balance, and state whether the current account is in surplus or deficit. (4 marks)

(b) Calculate the import price after the tariff and the tariff revenue. (3 marks)

(c) Calculate the new exchange rate and the Hong Kong dollar receipts from an export priced at US\$50 before and after the depreciation. (3 marks)

Answer 6 (10 marks)

(a) Balance of trade in goods = $48 - 62 = -\$14$ billion (a goods deficit).

Current account = $-14 + 6 - 2 + 2.5 = -\$7.5$ billion, so the current account is in deficit.

(b) Import price = $40 \times 1.25 = \$50.00$; tariff revenue = $(50 - 40) \times 7.5$ million units = \$7,500 million.

(c) New exchange rate = $7.80 \times 1.05 = \text{HK\$}8.19$ per US dollar.

The export earns $50 \times 7.80 = \text{HK\$}390.00$ before the depreciation and $50 \times 8.19 = \text{HK\$}409.50$ after it, i.e. HK\$19.50 more per unit.

Marking notes: (a) 2 marks for the goods balance and 2 for the current account; (b) 1 mark for the import price and 2 for the tariff revenue; (c) 1 mark for the new rate and 1 per conversion.