S4 Economics Practice Paper: Basic Economic Problems and Opportunity Cost, Demand, Supply and Elasticity, Price Controls, Production and Cost, Market Structure, National Income

Level: S4 | Subject: Economics | 75 minutes | 100 marks | 24 questions | answer key

Section A Basic Economic Problems and Opportunity Cost (18 marks)

Show all working. Give units and a brief explanation in every answer.

#	Question	Answer	Marks
1	Ming can work in a convenience store for $180 an hour or tutor for $250 an hour. He has 5 hours available each evening. (a) What is the opportunity cost of tutoring for the whole evening? (b) How much better off is he than if he worked in the store for the whole evening?	(a) Opportunity cost is the value of the next best alternative forgone: 5 x $180 = $900. (b) Tutoring income is 5 x $250 = $1,250, so he is $1,250 - $900 = $350 better off.	4
2	An economy produces only rice and cloth. Using all resources for rice gives 200 tonnes, and for cloth gives 1.5 million metres. The production possibility curve is a straight line. (a) Calculate the opportunity cost of one more tonne of rice. (b) Where does the combination of 150 tonnes of rice and 0.3 million metres of cloth lie?	(a) Opportunity cost = 1,500,000 / 200 = 7,500 metres of cloth per tonne of rice, constant along a straight-line PPC. (b) After 150 tonnes of rice the maximum cloth is (200 - 150) / 200 x 1,500,000 = 375,000 m, i.e. 0.375 million metres. The output of 0.3 million metres is below that maximum, so the point lies inside the PPC: resources are not fully used.	4
3	A community has 1,000 labour hours, which can produce either 500 meal boxes or 250 garments. (a) State the three basic economic questions. (b) Calculate the opportunity cost of one garment. (c) Which is a free good, oxygen in the air or a meal box? Explain.	(a) What to produce, how to produce and for whom to produce. (b) 500 / 250 = 2 meal boxes per garment. (c) Oxygen in the air is a free good: using more of it means giving up nothing, so its opportunity cost is zero. A meal box is an economic good because it uses scarce resources and has an opportunity cost.	5
4	Country A can produce 10 phones or 20 garments per hour; Country B can produce 6 phones or 18 garments per hour. Each country has 10 labour hours and currently devotes 5 hours to phones and 5 hours to garments. (a) Calculate the opportunity cost of one phone in each country. (b) State the good each country should specialise in. (c) If each specialises by comparative advantage, what are the combined outputs?	(a) Country A: 20 / 10 = 2 garments per phone; Country B: 18 / 6 = 3 garments per phone. (b) A has the lower opportunity cost of a phone (2 < 3), so it should specialise in phones; B has the lower opportunity cost of a garment (1/3 phone < 1/2 phone), so it should specialise in garments. (c) A produces 10 x 10 = 100 phones and B produces 10 x 18 = 180 garments, compared with 80 phones and 190 garments before, so trade can make both countries better off.	5

Section B Demand, Supply and Elasticity (17 marks)

Calculate elasticities with the original-value method and show the percentage changes.

#	Question	Answer	Marks
5	The price of a good falls from $20 to $18 and quantity demanded rises from 500 to 560 units. (a) Calculate the price elasticity	(a) Quantity change = (560 - 500) / 500 x 100% = +12%; price change = (18 - 20) / 20 x 100% = -10%; |Ed| = 12 / 10 = 1.2. (b) |Ed| > 1, so demand	4

	of demand. (b) Classify the elasticity and calculate the change in total revenue.	is elastic. Total revenue rises from 20 x 500 = $10,000 to 18 x 560 = $10,080, up $80, which is consistent with elastic demand when price falls.	
6	A household income rises from $25,000 to $27,000 a month and its demand for organic food rises from 40 to 46 packs. (a) Calculate the income elasticity of demand. (b) Classify the good.	(a) Income change = 2,000 / 25,000 x 100% = +8%; quantity change = 6 / 40 x 100% = +15%; Ey = 15 / 8 = 1.875. (b) Ey > 0, so it is a normal good; because Ey > 1 the quantity rises proportionally more than income, so it is a luxury.	4
7	The price of good Y rises by 10% and this makes the quantity demanded of good X fall by 4%. (a) Calculate the cross elasticity of demand of X with respect to Y. (b) State the relationship between X and Y and give one example.	(a) Exy = -4 / 10 = -0.4. (b) A negative cross elasticity means X and Y are complements, used together to satisfy the same want; for example printers and ink cartridges: a higher cartridge price reduces the demand for printers.	4
8	In a market the demand function is Qd = 180 - 4P and the supply function is Qs = 20 + 4P (Q is quantity, P is price). (a) Calculate the equilibrium price and quantity. (b) If demand becomes Qd = 220 - 4P, calculate the new equilibrium. (c) State whether this is a change in demand or in supply and explain why.	(a) 180 - 4P = 20 + 4P gives 8P = 160, so P = $20 and Q = 20 + 4 x 20 = 100 units. (b) 220 - 4P = 20 + 4P gives 8P = 200, so P = $25 and Q = 20 + 4 x 25 = 120 units. (c) At each price the quantity demanded is larger, so this is an increase in demand caused by a non-price factor: the demand curve shifts right while supply is unchanged, raising both equilibrium price and quantity.	5

Section C Price Controls and Market Intervention (17 marks)

Use Qd = 180 - 4P and Qs = 20 + 4P unless stated otherwise.

#	Question	Answer	Marks
9	The government imposes a price ceiling of $15. (a) Calculate quantity demanded, quantity supplied and the shortage. (b) Give two non-price rationing methods that appear under a price ceiling.	(a) Qd = 180 - 4 x 15 = 120 units; Qs = 20 + 4 x 15 = 80 units; shortage = 120 - 80 = 40 units. (b) Queuing (first come first served), ration coupons or a ballot; allocation by personal connections and black-market trading may also appear.	4
10	The government instead sets a price floor of $25. (a) Calculate the surplus. (b) If the government buys up the whole surplus, what is the cost? (c) Explain why the policy causes a loss of efficiency.	(a) Qd = 180 - 4 x 25 = 80 units; Qs = 20 + 4 x 25 = 120 units; surplus = 120 - 80 = 40 units. (b) Cost = 40 x $25 = $1,000. (c) The floor price exceeds the equilibrium, so units with marginal cost above buyers marginal value are still produced and bought by the government; those resources are worth more elsewhere, creating a deadweight loss and reducing total surplus.	4
11	The government instead sets a quota of 90 units. (a) Calculate the market price under the quota. (b) Compared with the free-market equilibrium, explain how consumer surplus and the surplus of quota holders change.	(a) 90 = 180 - 4P gives P = $22.5. (b) The free-market equilibrium is P = $20 and Q = 100 units; the quota raises price to $22.5 and cuts quantity to 90 units, so consumer surplus falls. Quota holders sell at the higher price and gain producer surplus, while the 10 units no longer traded create a deadweight loss.	4
12	The government levies a per-unit tax of $6 on sellers. (a) Calculate the price paid by buyers and the quantity traded. (b) Calculate the governments tax revenue. (c) State who bears the larger share of the tax and explain why.	(a) Buyer price P: 180 - 4P = 20 + 4(P - 6), so 180 - 4P = -4 + 4P, 8P = 184 and P = $23; quantity = 180 - 4 x 23 = 88 units. (b) Tax revenue = 88 x $6 = $528. (c) Buyers pay $3 more ($20 to $23) and sellers receive $3 less ($20 to $17 after tax), so the burden is split equally here because demand and supply have similar	5

		elasticity; in general the less elastic side bears more of the tax.	

Section D Production and Cost (16 marks)

Costs are in dollars. Give units in every answer.

#	Question	Answer	Marks
13	A firm has total fixed cost of $300 and total variable cost of $500 at an output of 20 units. (a) Calculate total cost, average fixed cost, average variable cost and average total cost. (b) If output rises to 25 units and total variable cost rises to $650, calculate the marginal cost.	(a) TC = 300 + 500 = $800; AFC = 300 / 20 = $15; AVC = 500 / 20 = $25; ATC = 800 / 20 = $40. (b) MC = (650 - 500) / (25 - 20) = $30. Only the change in total cost matters, so the fixed cost does not affect marginal cost.	4
14	When the number of workers rises from 1 to 4, total output is 10, 24, 36 and 44 units. (a) Calculate the marginal product of each additional worker. (b) State from which worker diminishing marginal returns begins and explain why.	(a) MP: worker 1 = 10, worker 2 = 24 - 10 = 14, worker 3 = 36 - 24 = 12, worker 4 = 44 - 36 = 8 units. (b) It begins with the third worker, where MP falls from 14 to 12 and then to 8. The fixed factors (plant and machinery) are unchanged, so each extra worker has less fixed capital to work with and adds less output: the law of diminishing marginal returns.	4
15	A firm expands output from 1,000 to 2,000 units and long-run average cost falls from $40 to $28. (a) Calculate the percentage fall in average cost. (b) Give three sources of economies of scale that explain this.	(a) (40 - 28) / 40 x 100% = 30%. (b) Technical economies (larger and more specialised machines, mass production, division of labour), managerial economies (specialist managers and departments spread fixed overheads), financial economies (bulk buying discounts and cheaper borrowing) and marketing economies (advertising and brand costs spread over more units).	4
16	A product sells for $50; average variable cost is $30 and total fixed cost is $4,000. (a) Calculate the contribution per unit and the break-even output. (b) Calculate the profit if 300 units are produced and sold.	(a) Contribution = 50 - 30 = $20 per unit; break-even output = 4,000 / 20 = 200 units. (b) Total contribution = 300 x 20 = $6,000, so profit = 6,000 - 4,000 = $2,000.	4

Section E Market Structure and Firm Behaviour (16 marks)

Explain the reasoning and the effect on the market in every answer.

#	Question	Answer	Marks
17	A perfectly competitive firm faces a market price of $50 and its marginal cost is MC = 10 + 2Q. (a) Calculate the profit-maximising output. (b) If average cost is $30 at 20 units, calculate profit. (c) What adjustment occurs in the long run?	(a) P = MC gives 50 = 10 + 2Q, so Q = 20 units. (b) Profit = (50 - 30) x 20 = $400. (c) Supernormal profit attracts new firms, market supply rises and price falls until P equals minimum AC; supernormal profit disappears and firms earn only normal profit in long-run equilibrium.	4
18	A monopolist faces demand P = 100 - 2Q and a constant marginal cost of $20. (a) Using MR = 100 - 4Q, calculate the profit-maximising output and price. (b) Compare output and price with perfect	(a) MR = MC gives 100 - 4Q = 20, so Q = 20 units and P = 100 - 2 x 20 = $60. (b) Under perfect competition 100 - 2Q = 20 gives Q = 40 units at P = $20. The monopolist charges $40 more and sells 20 units less: consumer surplus is transferred to the	4

	competition (P = MC) and state the effect on efficiency.	producer and some mutually beneficial trades do not occur, creating a deadweight loss.	
19	An industry has total sales of $20 billion; the four largest firms have sales of $4 billion, $2.5 billion, $1.5 billion and $1 billion. (a) Calculate the four-firm concentration ratio (CR4). (b) State which market structure the industry tends towards and explain.	(a) CR4 = (40 + 25 + 15 + 10) / 200 x 100% = 90 / 200 x 100% = 45%. (b) It tends towards oligopoly: a few firms hold nearly half the market, they are interdependent so each pricing and output decision depends on rivals reactions, and entry barriers and non-price competition (advertising, branding) are likely.	4
20	In a market six firms have shares of 30%, 25%, 15%, 10%, 10% and 10%. (a) Calculate the Herfindahl index (HHI). (b) If the two largest firms merge, what is the new HHI? Comment on the effect of the merger.	(a) HHI = 900 + 625 + 225 + 100 + 100 + 100 = 2,050. (b) The merged firm has 55%, so HHI = 3,025 + 225 + 100 + 100 + 100 = 3,550, which is 1,500 points higher. The merger sharply raises concentration and reduces the number of rivals, increasing market power and the ability to raise price, so competition authorities would normally review it.	4

Section F National Income and Macroeconomic Indicators (16 marks)

Amounts are in billion dollars; state rates as percentages.

#	Question	Answer	Marks
21	An economy has consumption $800 billion, investment $250 billion, government spending $200 billion, exports $450 billion and imports $500 billion. (a) Calculate GDP by the expenditure approach. (b) State net exports and what they imply.	(a) GDP = C + I + G + (X - M) = 800 + 250 + 200 + (450 - 500) = $1,200 billion. (b) Net exports = 450 - 500 = -$50 billion, a trade deficit. Imports are not counted directly in GDP, only net exports, so imported goods in domestic spending are not double counted.	4
22	Nominal GDP is $1,320 billion and the GDP deflator is 110. (a) Calculate real GDP. (b) If real GDP last year was $1,200 billion, calculate the real growth rate and explain the difference from nominal growth.	(a) Real GDP = 1,320 / 110 x 100 = $1,200 billion. (b) Real growth = (1,200 - 1,200) / 1,200 x 100% = 0%. Nominal GDP rose 10% (1,200 to 1,320) but prices also rose 10%, so the whole increase is offset by inflation and real output did not change.	4
23	Real GDP is $1,200 billion and population is 7.5 million. (a) Calculate real GDP per capita. (b) If population rises to 8 million with real GDP unchanged, calculate the new value and the percentage change. (c) Give two reasons why GDP per capita is an imperfect measure of living standards.	(a) 1,200 billion / 7.5 million = $160,000. (b) 1,200 billion / 8 million = $150,000, a change of (150,000 - 160,000) / 160,000 x 100% = -6.25%. (c) It ignores the distribution of income, non-market activities such as housework and volunteering, environmental damage and health costs, leisure time and product quality.	4
24	The labour force is 3.8 million and employment is 3.61 million. (a) Calculate the number unemployed and the unemployment rate. (b) If 100,000 unemployed people give up job search and leave the labour force, calculate the new unemployment rate and explain the effect.	(a) Unemployed = 380 - 361 = 190,000; rate = 19 / 380 x 100% = 5%. (b) Unemployment becomes 90,000 and the labour force 3.7 million, so the rate is 9 / 370 x 100% which is about 2.43%. The rate falls although no one found a job: discouraged workers leave the labour force and shrink the denominator, so the measured rate understates joblessness.	4