S5 Economics Practice Paper: Demand, Supply and Equilibrium, Elasticity and Total Revenue, Production Costs and Market Structure, National Income and the Multiplier, Money, Banking and Interest Rates, International Trade and Government Policy (100 marks)

S5 | Economics | Time: 75 minutes | Total: 100 marks | 24 questions

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Part 1: Demand, Supply and Equilibrium (17 marks)

Show all working steps and state the units in your answers.

1. The market demand for a good is Qd = 120 - 2P and supply is Qs = 30 + 3P (P in dollars, Q in units). Find the equilibrium price and quantity. [4]

Answer: Set Qd = Qs: 120 - 2P = 30 + 3P, so 5P = 90 and P = $18; substituting gives Q = 84 units.

2. If the price is set at $25, find the amount of surplus or shortage and state the direction of price adjustment. [4]

Answer: At P = $25, Qd = 70 and Qs = 105, so there is a surplus of 35 units and price tends to fall.

3. If a change in fashion raises quantity demanded by 20 units at every price, find the new equilibrium price and quantity. [4]

Answer: New demand is Qd = 140 - 2P; setting 140 - 2P = 30 + 3P gives P = $22 and Q = 96 units.

4. With the new demand, the government sets a price ceiling of $12. Find the shortage, the quantity actually traded and total consumer expenditure at that price. [5]

Answer: Qd = 96, Qs = 66, so the shortage is 30 units; quantity traded is limited to 66 units and total consumer expenditure = 12 x 66 = $792.

Part 2: Elasticity and Total Revenue (17 marks)

Give elasticity as an absolute value and state its type.

5. The price of a good rises from $20 to $22 and quantity demanded falls from 100 to 90 units. Using the percentage method, calculate the price elasticity of demand and state its type. [4]

Answer: Change in quantity = -10.0%, change in price = +10.0%; elasticity (absolute value) = 1.0, so demand is unit elastic.

6. The price elasticity of demand for a good (absolute value) is 2.5. If price falls by 8%%, find the percentage change in quantity demanded and in total revenue. [4]

Answer: Quantity demanded rises by 2.5 x 8 = 20%; the total revenue index is 0.92 x 1.20 = 1.104, so total revenue rises by 10.4%.

7. The price of a good rises from $10 to $12 and quantity supplied rises from 50 to 65 units. Calculate the price elasticity of supply and state its type. [4]

Answer: Quantity supplied rises by 30% and price by 20%; elasticity = 30 / 20 = 1.5, which exceeds 1, so supply is elastic.

8. A consumer's income rises from $20,000 to $22,000 and quantity demanded of a good rises from 200 to 230 units. Calculate the income elasticity and identify the type of good. [5]

Answer: Income rises by 10% and quantity demanded by 15%; income elasticity = 15 / 10 = 1.5, which exceeds 1, so it is a normal luxury good.

Part 3: Production Costs and Market Structure (17 marks)

Costs are in dollars and quantity in units.

9. A firm has total cost TC = 500 + 20Q + 2Q^2. Find total cost, average cost and marginal cost at Q = 10. [4]

Answer: TC = 500 + 200 + 200 = $900; AC = 900 / 10 = $90; MC = dTC/dQ = 20 + 4Q = $60.

10. For the same firm, find average fixed cost and average variable cost at Q = 10. [4]

Answer: AFC = 500 / 10 = $50; TVC = 20 x 10 + 2 x 100 = $400, so AVC = 400 / 10 = $40.

11. If the firm operates in perfect competition with a market price of $60 and produces where P = MC, find its output and profit, and explain whether it should keep producing in the short run. [4]

Answer: P = MC: 60 = 20 + 4Q, so Q = 10; TR = 60 x 10 = $600 and TC = $900, giving a loss of $300. Since P = $60 is above AVC = $40, the firm covers part of its fixed cost and should keep producing in the short run.

12. A monopolist faces demand P = 100 - 2Q with constant marginal cost of $20 and TC = 20Q. Find the profit-maximising output, price and profit. [5]

Answer: MR = 100 - 4Q; setting MR = MC gives 100 - 4Q = 20, so Q = 20 and P = $60; TR = 1200, TC = 400 and profit = $800.

Part 4: National Income, the Multiplier and Prices (17 marks)

Assume no foreign trade and no taxes unless stated otherwise.

13. An economy has C = 100 + 0.75Y, investment I = 300 and government spending G = 200. Find the equilibrium national income. [4]

Answer: Y = C + I + G = 100 + 0.75Y + 500, so 0.25Y = 600 and Y = $2400.

14. For the same economy, find the multiplier and the change in national income if investment rises by $50. [4]

Answer: Multiplier k = 1 / (1 - 0.75) = 4.0; change in income = 4.0 x 50 = $200.

15. An economy has private consumption of 1,200, investment 400, government spending 300, exports 500 and imports 350 (all in $ billion). Calculate GDP by the expenditure approach. [4]

Answer: GDP = C + I + G + X - M = 1,200 + 400 + 300 + 500 - 350 = 2050 billion dollars.

16. A city's consumer price index rises from 100 to 138 while the nominal wage rises by 20%%. Find the inflation rate, the real wage index and the percentage change in the real wage. [5]

Answer: Inflation = (138 - 100) / 100 = 38.0%; real wage index = 120 / 138 x 100 = 86.96, so the real wage changed by -13.04%, i.e. it fell by 13.04%.

Part 5: Money, Banking and Interest Rates (16 marks)

Give money amounts in dollars, to two decimal places where needed.

17. The public holds 200 units of currency and banks hold 800 units of deposits. Find the money supply and the cash-deposit ratio. [4]

Answer: Money supply = 200 + 800 = 1000 units; cash-deposit ratio = 200 / 800 = 0.25.

18. If the required reserve ratio is 12.5%% and the banking system receives 500 units of new deposits with no cash drain, find the deposit multiplier, the maximum total deposits and the new money created. [4]

Answer: Deposit multiplier = 1 / 0.125 = 8.0; maximum deposits = 500 x 8.0 = 4000 units; new money = 4000 - 500 = 3500 units.

19. The one-year nominal interest rate is 6%% and inflation is 4%%. Find the real interest rate using (1 + nominal) / (1 + inflation) - 1, to two decimal places. [4]

Answer: Real rate = (1.06 / 1.04 - 1) x 100% = 1.92% (approximately 6% - 4% = 2%).

20. A city pegs its currency at 7.80 per US dollar. The US price index is 110 and the domestic index is 121. Compute the purchasing-power-parity rate and judge whether the domestic currency is over- or undervalued in real terms. [4]

Answer: PPP rate = 7.80 x 121 / 110 = 8.58; with higher domestic prices the currency would need to depreciate to 8.58 to restore competitiveness, so at 7.80 it is overvalued in real terms.

Part 6: International Trade and Government Policy (16 marks)

Explain comparative advantage in terms of opportunity cost.

21. A country imposes a 20%% ad valorem tariff on imports. The world price is $100 per unit and imports are 8,000 units. Find the domestic price and the tariff revenue. [4]

Answer: Domestic price = 100 x 1.20 = $120; tariff revenue = 20 x 8,000 = $160000.

22. A producer can make either 4 units of good A or 8 units of good B per hour. Find the opportunity cost of one unit of A and of one unit of B. [4]

Answer: Opportunity cost of 1 unit of A = 8 / 4 = 2.0 units of B; opportunity cost of 1 unit of B = 4 / 8 = 0.5 units of A.

23. Country X can produce 4 units of A or 8 units of B per hour; country Y can produce 6 units of A or 6 units of B per hour. Use opportunity cost to decide what each country should specialise in. [4]

Answer: For X, 1 A costs 2 B; for Y, 1 A costs 1 B. Y has the lower opportunity cost of A and should specialise in A, while X has the lower opportunity cost of B (0.5 A) and should specialise in B.

24. A progressive tax charges 5%% on the first $100,000, 10%% on the next $200,000 and 17%% on the remainder. A person earns $400,000 a year. Find the tax payable and the average tax rate. [4]

Answer: Tax = 100,000 x 5% + 200,000 x 10% + 100,000 x 17% = 5,000 + 20,000 + 17,000 = $42000; average rate = 42000 / 400,000 = 10.5%.
