S5 Economics Practice Paper 1 | Elasticity, PPF, market equilibrium, GDP, CPI, unit tax

Senior Secondary Economics

S5 Economics practice paper with answers: price elasticity and total revenue, PPF, market equilibrium, price ceilings, GDP growth, CPI and unit tax incidence. 100 marks.

1. Price elasticity of demand and total revenue (16 marks)

Show working in all parts.

#	Question	Answer and marking notes
1	(a) A good's price falls from $20 to $16 and quantity demanded rises from 200 to 260 units. Using the percentage method, find the price elasticity of demand (absolute value).	Change in quantity = (260 - 200) / 200 = +30%; change in price = (16 - 20) / 20 = -20%; elasticity = 30% / 20% = 1.5.
2	(b) Referring to (a), is demand elastic or inelastic? How does total revenue change after the price cut?	Elasticity 1.5 > 1, so demand is elastic; total revenue rises from 20 x 200 = 4000 to 16 x 260 = 4160, an increase of 160.
3	(c) Another good's price rises from $10 to $12 and quantity demanded falls from 500 to 450 units. Find the absolute elasticity.	Change in quantity = (450 - 500) / 500 = -10%; change in price = (12 - 10) / 10 = +20%; absolute elasticity = 10% / 20% = 0.5.
4	(d) Referring to (c), how does total revenue change? What does this show about elasticity?	Total revenue rises from 10 x 500 = 5000 to 12 x 450 = 5400, up by 400; because elasticity 0.5 is below 1 (inelastic), a price rise increases total revenue.

2. Production possibility frontier and opportunity cost (18 marks)

Parts (a) to (c) are short answers; explain with working in (d).

#	Question	Answer and marking notes
5	(a) An economy produces only goods X and Y. Moving from (X 0, Y 100) to (X 20, Y 90), find the opportunity cost of one more unit of X.	Y falls by 100 - 90 = 10 units while X rises by 20, so one unit of X costs 10 / 20 = 0.5 units of Y.
6	(b) Moving on from (X 20, Y 90) to (X 40, Y 70), find the marginal opportunity cost in units of Y.	Y falls by 20 and X rises by 20, so the marginal opportunity cost is 20 / 20 = 1 units of Y.
7	(c) The opportunity cost rises from 0.5 to 1. Describe the shape of the frontier and explain why.	The frontier is bowed outward (concave to the origin) because resources are not perfectly transferable: producing more X means giving up ever more Y, so marginal opportunity cost rises.
8	(d) Technical progress raises the maximum output of Y from 100 to 120 (X unchanged). Find the opportunity cost of one unit of X from (X 0, Y 120) to (X 20, Y 108), and state how the frontier shifts.	Y falls by 120 - 108 = 12 while X rises by 20, so one unit of X costs 12 / 20 = 0.6 units of Y; the frontier shifts outward along the Y axis while the X intercept is unchanged.

3. Market equilibrium and price ceiling (16 marks)

Demand Qd = 120 - 2P, supply Qs = 3P - 30; show working throughout.

#	Question	Answer and marking notes
9	(a) Find the equilibrium price and quantity.	120 - 2P = 3P - 30, so 150 = 5P, P = 30 dollars and Q = 120 - 2 x 30 = 60 units.
10	(b) The government imposes a price ceiling of $25. Find the shortage.	At P = 25, Qd = 120 - 50 = 70 and Qs = 75 - 30 = 45, so the shortage is 70 - 45 = 25 units.
11	(c) If the ceiling were $35 instead, what happens to the market?	The ceiling is above the equilibrium price of 30 dollars, so it is non-binding: the market stays at P = 30 dollars, Q = 60 units with no shortage or surplus.
12	(d) Find the consumer surplus at equilibrium, given the highest willingness to pay is $60.	Consumer surplus = 1/2 x quantity x (highest willingness to pay - equilibrium price) = 1/2 x 60 x (60 - 30) = 900 dollars.

4. Gross domestic product and economic growth (18 marks)

Show working in (a) to (c); explain in (d).

#	Question	Answer and marking notes
13	(a) A place's nominal GDP rises from 200 billion to 220 billion dollars while the price index rises from 100 to 110. Find this year's real GDP at base-year prices.	Real GDP = nominal GDP / (price index / 100) = 220 / 1.10 = 2000 billion dollars.
14	(b) Find the real growth rate for the year.	Real growth = (200 - 200) / 200 x 100% = 0%.
15	(c) Population rises from 5.0 million to 5.2 million. Find real GDP per head at the start and at the end (to the nearest dollar).	Start = 200 billion / 5.0 million = 40,000 dollars; end = 200 billion / 5.2 million = 38,462 dollars.
16	(d) Nominal GDP rose 10%% while real growth was zero. Explain and find the inflation rate.	The whole rise in nominal GDP came from higher prices, not more output; inflation = (110 - 100) / 100 x 100% = 10%, matching the 10% rise in nominal GDP.

5. Consumer price index and inflation (16 marks)

A consumption basket has 40 units of food and 20 units of housing; the base year index is 100.

#	Question	Answer and marking notes
17	(a) In the base year food costs $10 a unit and housing $30 a unit. Find the base-year basket cost.	40 x 10 + 20 x 30 = 400 + 600 = 1,000 dollars.
18	(b) This year food costs $11 and housing $33 a unit. Find this year's basket cost.	40 x 11 + 20 x 33 = 440 + 660 = 1,100 dollars.

#	Question	Answer and marking notes
19	(c) With the base year at 100, find this year's consumer price index.	CPI = current cost / base cost x 100 = 1,100 / 1,000 x 100 = 110.
20	(d) The nominal wage rises from $20,000 to $21,500. Find the percentage change in the real wage.	Real wage = 21,500 / 1.10 = 19,545.45 dollars; change = (19,545.45 - 20,000) / 20,000 x 100% = -2.27%, i.e. a real fall of 2.27%.

6. Unit tax and tax incidence (16 marks)

Before tax, Qd = 100 - 2P and Qs = 2P - 20. The government levies a unit tax of $6 on producers.

#	Question	Answer and marking notes
21	(a) Find the equilibrium price and quantity after the tax.	New supply Qs = 2(P - 6) - 20 = 2P - 32; 2P - 32 = 100 - 2P gives 4P = 132, so P = 33 dollars and Q = 100 - 2 x 33 = 34 units.
22	(b) Find the price producers actually receive per unit.	Net price = consumer price 33 - tax 6 = 27 dollars.
23	(c) Find the government's total tax revenue.	Revenue = tax per unit x quantity = 6 x 34 = 204 dollars.
24	(d) Find the pre-tax equilibrium price and the share of the tax borne by consumers.	Pre-tax: 2P - 20 = 100 - 2P gives 4P = 120, P = 30 dollars; the price rises from 30 to 33, so consumers pay 3 more per unit, i.e. 50% of the 6 tax, with the other 50% borne by producers.