2.2 Elasticities of demand and supply

Name: _____ Class: _____ Date: _____ **Total: 26 marks**

KEY WORDS price elasticity of demand
- income elasticity of demand
- price elasticity of supply
- total revenue
- inferior good
- primary commodity

Objective

Build the skills to answer exam questions on **price elasticity of demand** (PED), **income elasticity of demand** (YED) and **price elasticity of supply** (PES), their determinants and their uses.

You must be able to:

- explain PED, YED and PES and their determinants
- explain the link between PED and total revenue
- explain why primary commodities have low PED and PES
- apply elasticities to firms and governments
- calculate PED, YED and PES and interpret the values

1 Key knowledge and worked examples

Elasticities

Elasticity measures how much one variable responds to a change in another.

measure	formula	key values
PED	$\frac{\%\Delta Q_d}{\%\Delta P}$	elastic: $\lvert\text{PED}\rvert > 1$; inelastic: < 1; unit elastic: $= 1$
YED	$\frac{\%\Delta Q_d}{\%\Delta Y}$	normal good: > 0 (necessity 0–1, luxury > 1); inferior good: < 0
PES	$\frac{\%\Delta Q_s}{\%\Delta P}$	elastic: > 1; inelastic: < 1

Determinants of PED: number and closeness of **substitutes**; whether a **necessity** or luxury; **proportion of income** spent on it; **time** to adjust; whether it is **addictive** or habit-forming.

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PED and total revenue ($TR = P \times Q$): if demand is **inelastic**, a price rise **raises** TR; if **elastic**, a price rise **lowers** TR. Along a straight-line demand curve, PED changes: elastic at high prices, inelastic at low prices.

Determinants of PES: time (supply is more elastic in the long run), **spare capacity**, **stocks**, **mobility of factors**, how fast costs rise.

Primary commodities (food, metals) have **low PED** (few substitutes, necessities) and **low PES** (crops take time to grow), so supply or demand shocks cause **large price swings**. Manufactured goods usually have higher PED and PES.

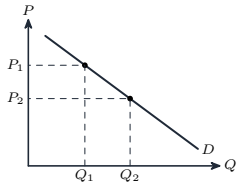
Uses: firms set prices (raise prices on inelastic goods); governments tax inelastic goods (cigarettes, fuel) to raise revenue; YED shows which sectors grow as incomes rise (services, luxury goods) and which shrink (inferior goods), so it guides firms and explains **sectoral change**.

AHL – calculations: use percentage changes, e.g. $\%\Delta Q = \frac{Q_2 - Q_1}{Q_1} \times 100$. PED is negative; economists usually quote its absolute value.

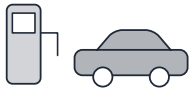
Answer shapes: state the elasticity, say elastic or inelastic, then link to revenue, tax or price changes.

2 Practice

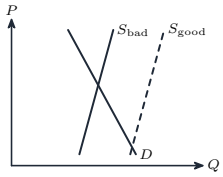
2.1 Define **price elasticity of demand**. [2]



2.2 Explain **two** reasons why demand for petrol is price inelastic. [2]



2.3 Explain why the prices of agricultural products tend to change a lot from year to year. [4]



[[drawlines:4]]

2.4 When a cinema raises its ticket price from \$10 to \$12, weekly sales fall from 2000 to 1800. Calculate the PED and the change in total revenue, and state whether the price rise was a good idea for revenue. [3]

price	\$10	\$12
sales	2000	1800

2.5 Household incomes rise by 5%. Demand for bus journeys falls by 2% and demand for restaurant meals rises by 8%. Calculate the YED for each and classify the goods. [3]

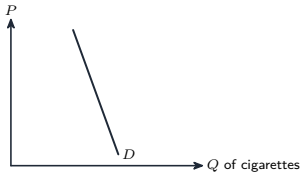


3 Exam-style questions

3.1 A government wants to raise tax revenue and reduce smoking.

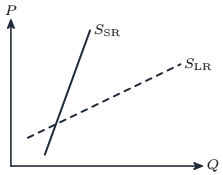
(a) Explain why cigarettes have a low PED. [2]

(b) Discuss whether taxing cigarettes will meet **both** of the government's aims. [6]



3.2 A car maker's price rises from \$20,000 to \$22,000 and it supplies 55 000 cars a year instead of 50 000.

(a) Calculate the PES. [2]



(b) Explain why PES is likely to be higher in the long run. [2]

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Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

2.1

a measure of how responsive the quantity demanded of a good is; to a change in its own price

2.2

any two: few close substitutes in the short run; a necessity for many drivers / workers who commute; habit; costs of switching to electric cars or public transport are high

2.3

demand for food is price inelastic: necessity, few substitutes; supply is price inelastic in the short run because crops take time to grow; supply shifts a lot because of weather and disease; with steep (inelastic) curves, a shift in supply causes a large change in price

2.4

$\%\Delta Q = -10\%$, $\%\Delta P = +20\%$, PED $= \mathbf{-0.5}$ (inelastic); TR rises from \$20,000 to \$21,600, a rise of \$**1600**; yes: demand is inelastic, so the price rise increased revenue

2.5

bus: $-2 \div 5 = \mathbf{-0.4}$: inferior good; meals: $8 \div 5 = \mathbf{1.6}$; a normal good and a luxury (income elastic)

3.1

(a) addictive / habit-forming; few close substitutes

(b) a tax raises the price; because demand is inelastic, quantity falls only a little; so the tax raises a lot of revenue: aim 1 met; but smoking falls only a little: aim 2 only partly met; in the long run demand becomes more elastic (people quit, fewer start), so smoking falls more; risks: smuggling, a regressive burden on low-income smokers; judgement: good for revenue; for health it works better with bans, education and support to quit

3.2

(a) $\%\Delta Q_s = 10\%$, $\%\Delta P = 10\%$; PES $= \mathbf{1}$ (unit elastic)

(b) in the long run firms can build new factories, hire and train workers, and new firms can enter; so quantity supplied can respond more to a price change

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