May 2013 HLP3 - quantitative questions

Sub-topic	HL extension	Questions
Linear demand functions (equations), demand schedules and graphs	**Explain a demand function (equation) of the form Qd = a – bP.** • Plot a demand curve from a linear function (eg, Qd = 60 – 5P). • Identify the slope of the demand curve as the slope of the demand function Qd = a – bP, that is –b (the coefficient of P). • Outline why, if the "a" term changes, there will be a shift of the demand curve. • Outline how a change in "b" affects the steepness	• Explain that a is the horizontal intercept (Qd when P = 0) • Explain -b as the gradient. Explain that if b increases, the curve will become less steep • Comment on the effect of a change in a or a change in b • Plot the demand curve - must determine the limits - should be given in the question. • Determine the Qd at different prices • Determine the price which will give rise to a given Qd.
Linear supply functions, equations and graphs	**Explain a supply function (equation) of the form Qs = c + dP.** • Plot a supply curve from a linear function (eg, Qs = –30 + 20 P). • Identify the slope of the supply curve as the slope of the supply function Qs = c + dP, that is d (the coefficient of P). • Outline why, if the "c" term changes, there will be a shift of the supply curve. • Outline how a change in "d" affects the steepness of the supply curve.	• Explain that c is the horizontal intercept (Qs when P = 0) • Explain d as the gradient. Explain that if d increases, the curve will become less steep • Comment on the effect of a change in c or a change in d • Plot the supply curve - must determine the limits - should be given in the question. • Determine the Qs at different prices • Determine the price which will give rise to a given Qs.
Calculating and illustrating equilibrium using linear equations	• Calculate the equilibrium price and equilibrium quantity from linear demand and supply functions. • Plot demand and supply curves from linear functions, and identify the equilibrium price and equilibrium quantity. • State the quantity of excess demand or excess supply	• Calculate equilibrium from the equations • Calculate the excess demand/supply at a given price • Calculate the price which would lead to a given excess demand/supply (too hard)
Price elasticity of demand and its determinants	Explain the concept of price elasticity of demand, understanding that it involves responsiveness of quantity demanded to a change in price, along a given demand curve. • Calculate PED using the following equation. PED = <u>% change in quantity demanded</u> 　　　　% change in price • State that the PED value is treated as if it were positive although its mathematical value is usually negative. • Explain, using diagrams and PED values, the concepts of price elastic demand, price inelastic demand, unit elastic demand, perfectly elastic demand and perfectly inelastic demand.	• Calculate PED from given % changes in P and Qd • Calculate PED from given points on a demand curve • Explain the significance (or lack of it) of the sign (+ve or -ve) of the PED • Explain why the PED is not the same as the gradient of the demand curve • From a given PED, calculate the new/change in Qd resulting from a given change in price

	• Explain the determinants of PED, including the number and closeness of substitutes, the degree of necessity, time and the proportion of income spent on the good. • Calculate PED between two designated points on a demand curve using the PED equation above. • Explain why PED varies along a straight line demand curve and is not represented by the slope of the demand curve.	
Applications of price elasticity of demand	Examine the role of PED for firms in making decisions regarding price changes and their effect on total revenue. • Explain why the PED for many primary commodities is relatively low and the PED for manufactured products is relatively high.	• Recognise the effect on total revenue of a change in price under differing values of PED
Cross price elasticity of demand and its determinants	Outline the concept of cross price elasticity of demand, understanding that it involves responsiveness of demand for one good (and hence a shifting demand curve) to a change in the price of another good. • Calculate XED using the following equation. XED = % change in quantity of good A demanded % change in price of good B • Show that substitute goods have a positive value of XED and complementary goods have a negative value of XED. • Explain that the (absolute) value of XED depends on the closeness of the relationship between two goods.	• Calculate XED from given % changes in Pa and Qdb • Calculate XED from given levels (original and final) of Pa and Qdb • Explain the significance of the sign (+ve or -ve) and magnitude of the XED • From a given XED, calculate the new/change in Qdb resulting from a given change in Pa
Applications of cross price elasticity of demand	Examine the implications of XED for businesses if prices of substitutes or complements change.	
Income elasticity of demand and its determinants	Outline the concept of income elasticity of demand, understanding that it involves responsiveness of demand (and hence a shifting demand curve) to a change in income. • Calculate YED using the following equation. YED = % change in quantity demanded % change in income • Show that normal goods have a positive value of YED and inferior goods have a negative value of YED. • Distinguish, with reference to YED, between necessity (income inelastic) goods and luxury (income elastic) goods.	• Calculate YED from given % changes in Y and Qd • Calculate YED from given levels (original and final) of Y and Qd • Explain the significance of the sign (+ve or -ve) and magnitude of the YED • From a given YED, calculate the new/change in Qd resulting from a given change in P
Applications of income	• Examine the implications for producers and for the economy of a relatively	

elasticity of demand	low YED for primary products, a relatively higher YED for manufactured products and an even higher YED for services.	
Price elasticity of supply and its determinants	Explain the concept of price elasticity of supply, understanding that it involves responsiveness of quantity supplied to a change in price along a given supply curve. • Calculate PES using the following equation. PES = <u>% change in quantity supplied</u> % change in price • Explain, using diagrams and PES values, the concepts of elastic supply, inelastic supply, unit elastic supply, perfectly elastic supply and perfectly inelastic supply. • Explain the determinants of PES, including time, mobility of factors of production, unused capacity and ability to store stocks.	• Calculate PES from given % changes in P and Qs • Calculate PESfrom given points on a supply curve • Explain why the PES is not the same as the gradient of the supply curve • From a given PES, calculate the new/change in Qs resulting from a given change in price • Explain why any straight line curve through the origin represents unitary elasticity all along the curve
Applications of price elasticity of supply	Explain why the PES for primary commodities is relatively low and the PES for manufactured products is relatively high.	
Tax incidence and price elasticity of demand and supply	• Explain, using diagrams, how the incidence of indirect taxes on consumers and firms differs, depending on the price elasticity of demand and on the price elasticity of supply. • Plot demand and supply curves for a product from linear functions and then illustrate and/or calculate the effects of the imposition of a specific tax/per unit subsidy on the market (on price, quantity, consumer expenditure, producer revenue, government revenue, consumer surplus and producer surplus).	• Plot a demand and supply curve from equations • Draw the new supply curve for a given specific indirect tax (or subsidy) • Determine the initial and new equilibria • Calculate the change in consumer expenditure, producer revenue, tax revenue, government expenditure. • Calculate the incidence (total and per unit) of the tax/subsidy on producer and consumer. • Calculate the changes in consumer surplus and producer surplus • Perform the above given a change in PED and then in PES (change the equations accordingly) - consider the changing incidence
Price ceilings (maximum prices): rationale, consequences and examples	• Calculate possible effects from the price ceiling diagram, including the resulting shortage and the change in consumer expenditure (which is equal to the change in firm revenue).	• Plot demand and supply curves • Calculate/identify excess demand at a given ceiling price which is set below the equilibrium • Calculate the change in consumer expenditure/producer revenue arising from the ceiling price

		• identify the per unit (and total) subsidy needed to eliminate the shortage
Price floors (minimum prices): rationale, consequences and examples	• Calculate possible effects from the price floor diagram, including the resulting surplus, the change in consumer expenditure, the change in producer revenue, and government expenditure to purchase the surplus.	• Plot demand and supply curves • Calculate/identify excess supply at a given floor price which is set above the equilibrium • Calculate the change in consumer expenditure/ producer revenue arising from the ceiling price • identify the government expenditure needed to purchase the shortage
Production in the short run: the law of diminishing returns	• Distinguish between the short run and long run in the context of production. • Define total product, average product and marginal product, and construct diagrams to show their relationship. • Explain the law of diminishing returns. • Calculate total, average and marginal product from a set of data and/or diagrams.	• Complete a table to show TP, AP, MP • Identify TP, AP and MP from diagrams
Costs of production in the short run	Explain the distinction between the short run and the long run, with reference to fixed costs and variable costs. • Distinguish between total costs, marginal costs and average costs. • Draw diagrams illustrating the relationship between marginal costs and average costs, and explain the connection with production in the short run. • Explain the relationship between the product curves (average product and marginal product) and the cost curves (average variable cost and marginal cost), with reference to the law of diminishing returns. • Calculate total fixed costs, total variable costs, total costs, average fixed costs, average variable costs, average total costs and marginal costs from a set of data and/or diagrams.	• Complete a table to show TC, AC, MC • Identify TC, AC and MC from diagrams
Total revenue, average revenue and marginal revenue	Distinguish between total revenue, average revenue and marginal revenue. • Illustrate, using diagrams, the relationship between total revenue, average revenue and marginal revenue. • Calculate total revenue, average revenue and marginal revenue from a set of data and/or diagrams.	• Complete a table to show TR, AR, MR • Identify TR, AR and MR from diagrams
Economic profit (sometimes known as supernormal profit or	• Calculate different profit levels from a set of data and/or diagrams.	• From tables or diagrams, calculate TR and TR and hence determine economic profit

abnormal profit) and normal profit (zero economic profit occurring at the break-even point)		
Shut-down price and break-even price	• Calculate the short run shut-down price and the break-even price from a set of data	• From data/tables. determine the minimum AVC and/or ATC and hence identify the break-even and shut-down price
Revenue maximization	Calculate from a set of data and/or diagrams the revenue maximizing level of output.	• Determine the level of output where TR is maximised/MR = 0 to calculate the revenue maximising level of output
Game theory	Explain how game theory (the simple prisoner's dilemma) can illustrate strategic interdependence and the options available to oligopolies.	
Measures of economic activity: gross domestic product (GDP), and gross national product (GNP) or gross national income (GNI)	• Calculate nominal GDP from sets of national income data, using the expenditure approach. • Calculate GNP/GNI from data • Calculate real GDP, using a price deflator.	• Perform calculations to determine GDP and GNP/GNI • From a given price index (deflator) and a given "base year" calculate real GDP at base year prices
The nature of the Keynesian multiplier	Calculate the multiplier using either of the following formulae. $\dfrac{1}{1-MPC}$ or $\dfrac{1}{MPS + MPT + MPM}$ • Use the multiplier to calculate the effect on GDP of a change in an injection in investment, government spending or exports.	• Calculate MPC, MPS etc from given data • Calculate the value of the multiplier • calculate the effect on GDP of a change in an injection • Determine the increase in I or G which would be needed to effect a given change in GDP
The meaning of unemployment	• Calculate the unemployment rate from a set of data.	• Calculate the rate of unemployment
The meaning of inflation, disinflation and deflation	• Construct a weighted price index, using a set of data provided. • Calculate the inflation rate from a set of data.	• Construct a price index given the base year,prices and weights (quantities purchased, % of income spent on each item) • Use the price index to calculate the annual rate of inflation
The meaning of economic growth	Calculate the rate of economic growth from a set of data.	• Calculate the percentage change in real GDP - may need to calculate GDP, a price index, then real GDP and finally the percentage change
The role of taxation in promoting equity	Calculate the marginal rate of tax and the average rate of tax from a set of data.	• Given marginal tax rates and income brackets, calculate the tax payable on a given level of income.

		• Use results to calculate (marginal and) average rates of tax • From a bar chart giving tax rates, determine marginal tax rates and average tax rates • For an indirect tax (eg 15%), determine the tax paid on a given level of expenditure • Calculate the average tax rate, taking into account both direct and indirect tax
Absolute and comparative advantage	Draw a diagram to show comparative advantage. • Calculate opportunity costs from a set of data in order to identify comparative advantage. • Draw a diagram to illustrate comparative advantage from a set of data.	• Given the output per worker per day in two countries, determine the opportunity costs, the existence of absolute/comparative advantage and the possible terms of trade • Construct a diagram to illustrate comparative advantage
Types of trade protection	Calculate from diagrams the effects of imposing a tariff on imported goods on different stakeholders, including domestic producers, foreign producers, consumers and the government. • Calculate from diagrams the effects of setting a quota on foreign producers on different stakeholders, including domestic producers, foreign producers, consumers and the government. • Calculate from diagrams the effects of giving a subsidy to domestic producers on different stakeholders, including domestic producers, foreign producers, consumers and the government.	• From given diagrams (or perhaps using curves which have been plotted from equations) identify/calculate the effects on all stakeholders and the change in net welfare (deadweight loss)
Determination of freely floating exchange rates	Calculate the value of one currency in terms of another currency. • Calculate the exchange rate for linear demand and supply functions. • Plot demand and supply curves for a currency from linear functions and identify the equilibrium exchange rate. • Using exchange rates, calculate the price of a good in different currencies.	• Give an exchange rate (US$1 = NZ$1.4), calculate the value, in US$, of NZ$1. • From given equations, calculate the equilibrium exchange rate, plot the curves and identify equilibrium. • Given the price of a product in one currency and the exchange rate, calculate its price in the other currency.
Causes of changes in the exchange rate	• Calculate the changes in the value of a currency from a set of data.	• Given a change in the price of a product in a foreign currency, calculate the change in the exchange rate which caused it. • Given an index such as the Big Mac, determine exchange rates
The components of the balance of payments accounts	• • Calculate elements of the balance of payments from a set of data.	• Given some components, calculate other components and/or prepare the whole statement (see appendix)
Measurement	• Explain the meaning of the terms of trade.	• Given an export price index and an import price index,

| | • Explain how the terms of trade are measured.
• Distinguish between an improvement and a deterioration in the terms of trade.
    •   • Calculate the terms of trade using the equation: Index of average export prices/index of average import prices | calculate the terms of trade index, determine the extent of the improvement or deterioration (in percentage terms) |