3E1 2010 SOLUTIONS

1.

(a) Explain the meaning of each of the following terms in relation to a firm:

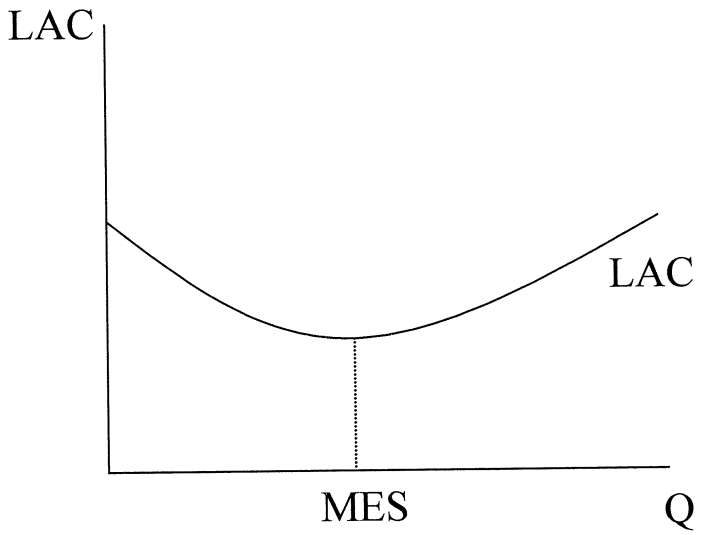
i) Increasing returns to scale [10%]

Increasing returns to scale is a property of a firm's technology, according to which a proportionate increase in all factors of production leads to a more than proportionate increase in output. If technology is expressed in terms of a simple two-factor production function, $Q = f(K, L)$, increasing returns to scale requires that if all inputs are scaled up by t, then:

$$tf(K, L) < f(tK, tL)$$

ii) Minimum efficient scale [10%]

The minimum efficient scale (MES) of a firm is the lowest level of output at which long run average costs are minimised. Graphically:

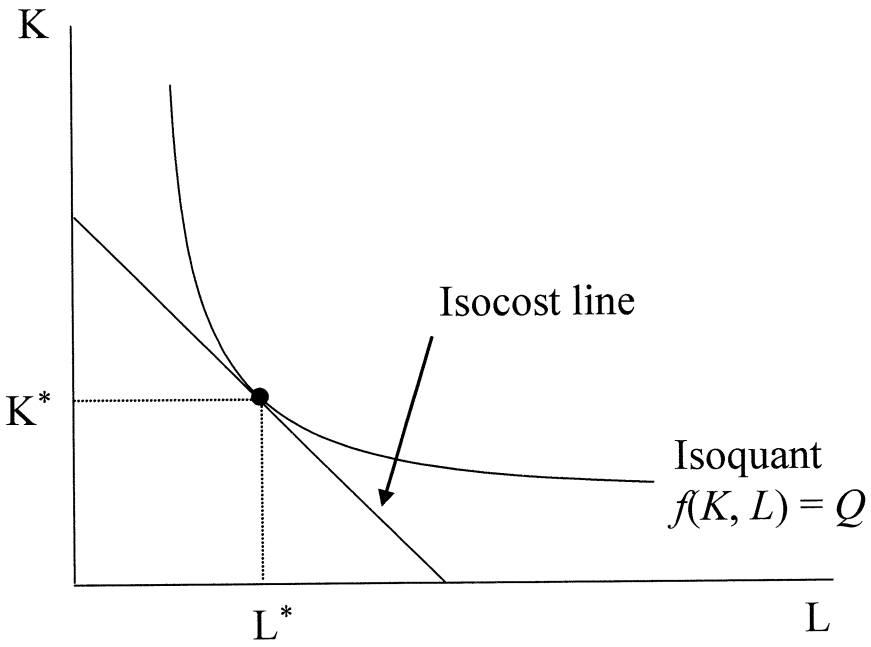


(b) Define the marginal rate of technical substitution of labour for capital and explain why it is equal to the factor price ratio when a firm is in equilibrium. [25%]

The marginal rate of technical substitution of labour for capital (MRTS) measures the rate at which a firm is able to substitute labour for capital while keeping output constant. Graphically the MRTS is the slope of an isoquant.

In the long-run, a profit-maximising firm will necessarily produce at a point where the MRTS equals the factor price ratio. One way to show this to examine the solution to a firm's (long-run) cost minimisation problem, since whatever level of output a profit maximising firm decides to produce, it must do so in the lowest cost way in order to profit maximise.

Suppose that a profit maximising firm produces output level Q. As per the lecture notes, the cost minimising choice of inputs to produce Q occurs where the isoquant associated with Q touches the lowest isocost curve:



Hence (assuming a well behaved isoquant as shown) the lowest cost choice of inputs (K*, L*) involves a tangency between the isoquant and the isocost line. Since the slope of an isoquant is the MRTS and the slope of the isocost line is the factor price ratio, in equilibrium a firm will operate where the MRTS equals the factor price ratio, as per the question. A very good answer might note that tangency (and hence the condition in the question) need not apply if the isoquant is not well behaved.

(c) Explain the difficulties of using fiscal policy for short-term demand management of the economy.

[25%]

Fiscal policy involves the use of tax and spend policy to stimulate or contract aggregate demand. To increase demand, the authorities might increase expenditure, cut taxes or increase borrowing. To decrease demand they might cut expenditure, increase taxes or decrease borrowing (repay debt). The main difficulties of using fiscal policy for short-term demand management are:

- Fiscal policy measures may lead to offsetting changes in other components of aggregate demand.

- Changing taxes to affect consumption spending may be offset by changes in saving.

- Difficulties in predicting the effects of fiscal policy:
  - The size of the multiplier is difficult to measure and may fluctuate
  - Induced investment through the accelerator is difficult to predict
  - Multiplier/accelerator interactions even more difficult to predict

- Problems of timing
  - Recognition lag
  - Lag between recognition and action
  - Lag between action and policies taking effect

- Side effects of discretionary fiscal policy
  - Cost inflation
  - Fiscal policy may conflict with welfare and distributive justice
  - Discretionary fiscal policy also has incentive effects

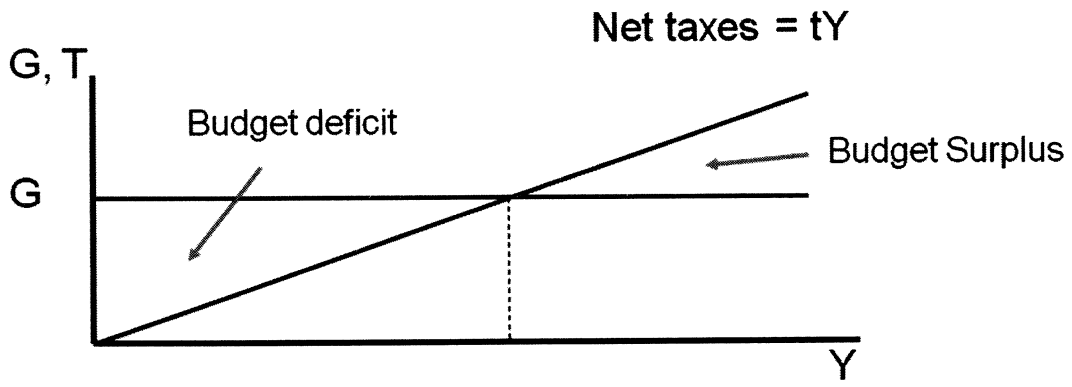
(d) Explain why the Government Budget Deficit is not necessarily a good indicator of the government's fiscal stance. [15%]

The government budget deficit describes i) the goods and services the government will buy during a year, ii) the transfer payments it will make and iii) how it will pay for i) and ii). It is equal to:

$$GBD = G - NT$$

where GBD Denotes the government budget deficit, G government spending and NT net taxes or taxes minus transfer payments.

Suppose that taxes are a fixed proportion of aggregate income Y. The GBD can then be depicted as follows.



The budget surplus/deficit is determined by t, G and Y. Only t and G are under direct government control and it may well be that the government runs a budget surplus (deficit), not because it intends to damp down (stimulate) the economy, but because it is brought into that situation by the level of Y.

In short, the GBD is not a good indicator of the government's fiscal policy stance because it can change for reasons that have nothing to do with government policy. For example, in a recession Y falls, tax revenues fall as a result and the GBD may go into deficit.

(e) In the context of the simple Keynesian Cross model, explain why a balanced budget is stimulatory. [15%]

The easiest way to answer this question is with a simple numerical example. Suppose that the economy is in equilibrium with an output of £1000 (without government or taxes) and then that:

- the tax rate t is increased from 0 to 0.2 (initial tax revenue of £200)
- Government spending G rises to 200

Suppose the Marginal Propensity to Consume (MPC) out of disposable income is 0.7. The initial reduction of C will only be 140 (200 * 0.7). As G increases by £200 the net initial increase in AD is 60. The final increase in equilibrium output is 136 (£60 * [1/(1 - MPC')]), where MPC' = 0.56 is the Marginal Propensity to Consume after the tax has been imposed.

2.

(a) Briefly enumerate and explain what you see as the main causes of the recent financial crisis. [30%]

There are many ways to answer this question, but the conventional story runs something as follows:

- The Dollar exchange rate had for many years been supported by foreign capital being exported to the US despite v. low interest rates
- US consumer goods inflation was thus kept in check by cheap imports
- This in turn persuaded the Fed to keep interest rates low for too long
- There followed a massive expansion of debt, also outside of the US
- Asset prices rocketed as a result, along with a general deterioration of credit quality (especially miss-sold and subsequently securitised mortgages)

- Finally, all this led to a massive loss of confidence when the dam burst, and an almost complete drying up of credit

Good answers might refer to some of the following micro and macro factors. On the micro side:

- Mis-selling of mortgages
- Securitisation of an untested asset class which led to mis-pricing of the risk of certain products - Asset-Backed Securities, Collateralised Debt Obligations and Credit Default Swaps
- Abolition of the Glass-Steagall Act in 1999, which eroded the fundamental separation, made after the Great Depression, between commercial banks and investment banks
- Inadequate regulation of investment banks' risk levels

On the macro side:

- US fiscal policy had been too lax (the US administration sought both to cut taxes and to fight a war, and the tax cuts induced consumers to spend beyond their, and thereby the country's, long-term means)
- US monetary policy too has been too easy for too long (following the multiple rounds of cuts in official interest rates after the dotcom crash and 9/11, US rates were almost 400 basis points below where their traditional relationship with growth and inflation would have put them)
- Globally, interest rates were extremely low historically. This fuelled both a credit boom and an asset price boom. Rising asset prices, particularly housing, generated unrealistic expectations about the pace at which peoples' wealth would grow in the future, and the collapse when it occurred was then correspondingly dramatic

(b) Briefly explain the logic of how each of the following policy measures were meant to help alleviate the crisis:

i) interest rate reductions; [10%]

Interest rates represent the cost of borrowing and the interest rate reductions were aimed chiefly at supporting consumer spending and slowing the decline of asset prices.

ii) the reduction in the rate of VAT; [10%]

The reduction of VAT is equivalent to an increase in the disposable income of households and was introduced as a means of supporting consumer spending.

iii) quantitative easing; [10%]

Quantitative easing is an extreme form of monetary policy used to stimulate the economy when interest rates are close to zero and cannot be reduced further, and involves the Central Bank increasing the money

supply via the purchases of government bonds from the banking system. The purpose of quantitative easing is to increase the amount of money in circulation and thus stimulate spending. It is also a means of reducing the threat of deflation, a situation in which self-fulfilling expectations of future price falls lead to a sharp drop off of consumer demand.

iv) the partial nationalization of the banks. [10%]

The purpose of the partial nationalization of the banks was to ensure their survival after they had become insolvent (i.e. the banks concerned could not find the capital required to shore up their balance sheets on the financial markets, and the State stepped in to provide the capital instead). The judgment of the authorities was that this measure was necessary in some cases, because allowing very large individual banks to fail might have led to knock on effects on other banks and possibly to the collapse of the system as a whole.

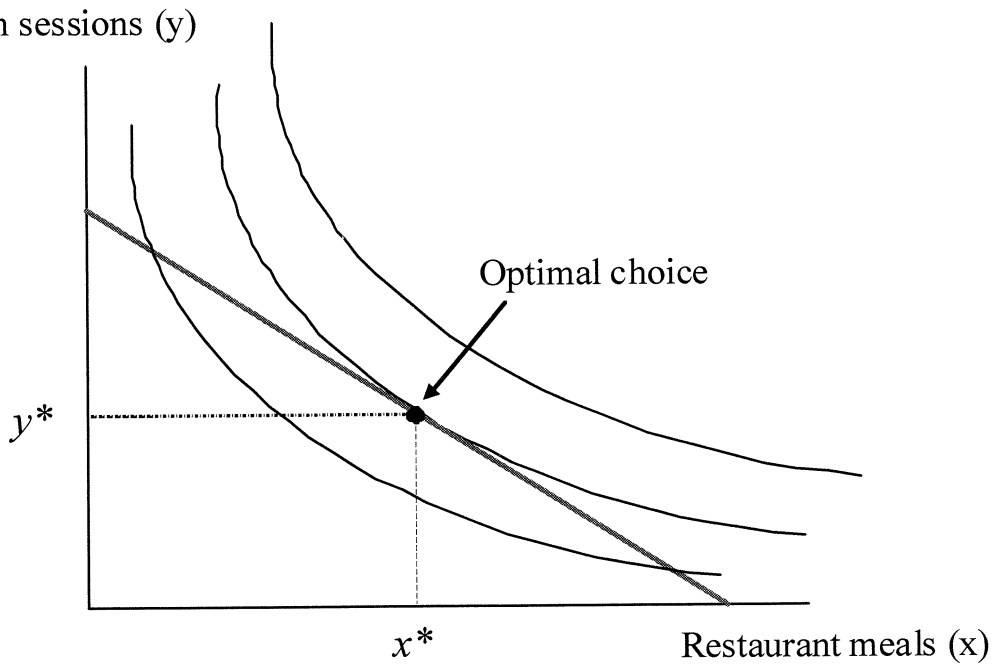
(c) Bill and Jenny are talking about how much they like going to the gym and how much they like eating out at their favourite restaurant. A session at the gym costs the same as a meal at the restaurant. Bill says that, for his current consumption of gym sessions and restaurant meals, he values one more meal twice as much as he values one more session at the gym. Jenny tells him that he cannot be choosing his optimal consumption bundle. Is Jenny right? Why or why not? [30%]

Provided Bill has well behaved preferences Jenny is correct.

The question tells us that Bill is prepared to exchange one restaurant meal for two gym sessions given his current consumption. This means that Bill's marginal rate of substitution (MRS) of gym sessions for restaurant meals, i.e. the rate at which he is prepared to substitute gym sessions for meals, is two.

The question also tells us that the price ratio is one, since a session at the gym costs the same as a meal at the restaurant.

Now assuming that Bill has well behaved preferences, his optimal choice must necessarily involve a tangency between his budget line and the highest indifference curve he can attain. Illustrate this with the standard diagram depicting an actor's optimal choice given a budget constraint:



The tangency at the optimal choice is characterised by the slope of the indifference curve being equal to the slope of the budget line. Since the slope of the indifference curve is the MRS and the slope of the budget line is the price ratio, optimal choice for an actor with well behaved preferences must involve the MRS being equal to the price ratio.

Thus given the information in the question, if Bill has well-behaved preferences, he cannot currently be choosing his optimal consumption bundle. In this case he would be better off consuming fewer gym sessions and more restaurant meals.

3.

(a) Being careful to explain your reasoning, determine the solution (if one exists) to the following game using the method of iterative deletion of strictly dominated strategies:

		Player 2		
		L	C	R
Player 1	T	(2, 0)	(1, 1)	(4, 2)
	M	(1, 4)	(1, 2)	(2, 3)
	B	(1, 3)	(0, 2)	(3, 0)

Payoffs are shown as (player 1, player 2)

[15%]

First explain what is meant by a strictly dominated strategy: a player has a strictly dominated strategy if, for each possible action that her opponent can take, she has another strategy that leads to a payoff that is strictly greater than the payoff associated with the original (dominated) strategy

The only strictly dominated strategy in this game is B for Player 1 (which is dominated by strategy T). Deleting B yields a modified game in which C is then strictly dominated for Player 2. Deleting C and continuing the process of iterative deletion then eliminates M and finally L, leaving (T, R) as the unique solution to the original game.

(b) 'If a player has a strictly dominant strategy in a simultaneous-move game, then she is sure to get her best outcome.' Is this statement true or false? Explain your reasoning and give an example of a game that illustrates your answer. [30%]

This statement is false.

First define strictly dominant strategy: a player has a strictly dominant strategy if, for each possible action that her opponent can take, that strategy leads to a payoff that is strictly greater than the payoff associated with any of her other strategies.

Then argue that if a player has a strictly dominant strategy (and plays it), all this guarantees is that she will get her best outcome *given* the choice(s) of the other player(s). However this does not ensure that she will get her best possible outcome in the game as a whole. The Prisoner's dilemma provides a simple illustration of this.

		Player 2	
		Deny	Confess
Player 1	Deny	(2, 2)	(0, 3)
	Confess	(3, 0)	(1, 1)

Here Confess is a strictly dominant strategy for Player 1. Yet by choosing to Confess Player 1 is not guaranteed to get her best outcome (which is 3), since the outcome Player 1 actually achieves also depends on the action of Player 2. In this case, provided Player 2 is rational and therefore chooses to Confess, Player 1 will gain a payoff of only 1 by playing her strictly dominant strategy. Thus the statement in the question is false.

(c) Explain the difference between fixed and floating exchange rates.

[15%]

A fixed exchanged rate is one that is fixed or 'pegged' in value against another currency, a basket of currencies, or a commodity such as gold. A floating exchange rate is one that is market determined, i.e.

determined by forces of demand and supply on the foreign exchange market. Fixed exchange rates require active intervention by the monetary authorities, who have to buy (sell) the domestic currency on the foreign exchange market to maintain the pegged rate in situations in situations of excess supply (demand). Good answers might be illustrated with a standard demand-supply diagram.

(d) Explain why monetary policy is unlikely to be effective under fixed exchange rates. [10%]

Under fixed exchange rates the money supply must adjust to ensure that the exchange rate stays at its pegged level. Attempting to reduce (raise) interest rates to stimulate (damp down) the economy will then be ineffective. For example, an interest rate reduction will decrease the demand for the domestic currency on foreign exchange markets, and the monetary authorities will then be forced to buy the domestic currency to maintain the pegged exchange rate. The attempt to increase the money supply via lower interest rates will thus be thwarted.

(e) Briefly explain the theory of comparative advantage and then state and evaluate some of the arguments that have been made to the effect that it is nevertheless sometimes necessary to implement protectionist trade policies. [30%]

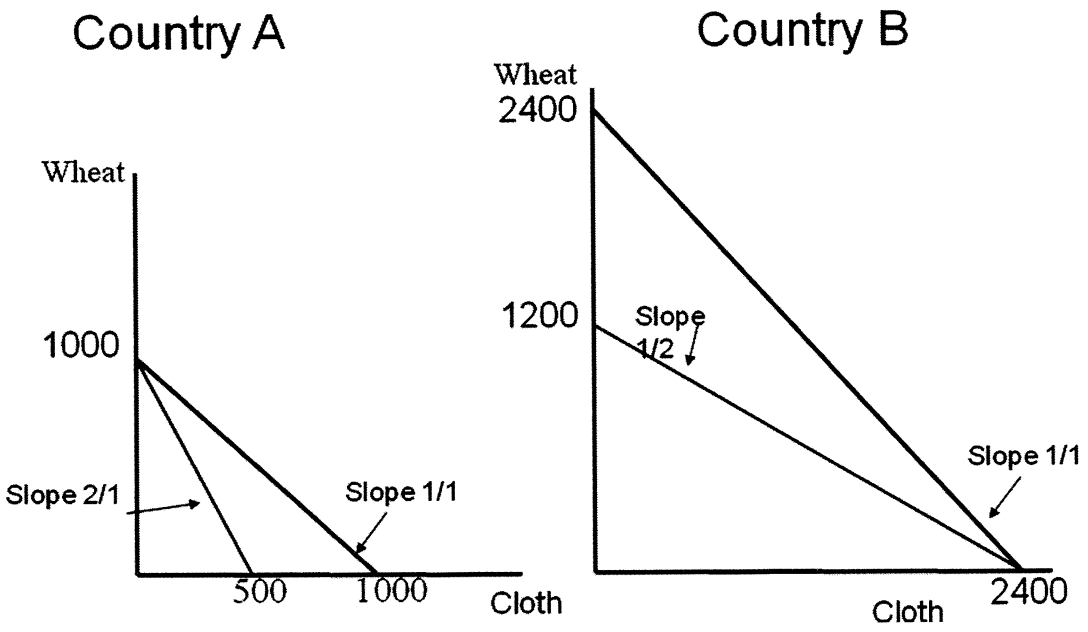
The theory of comparative advantage states that the consumption possibilities of a country are maximized if it specializes in the production of goods in which it has a comparative advantage and trades for the goods it does not produce. The theory can be illustrated by way of a simple numerical example. Suppose there are two countries A and B with the following production possibilities:

		Kilos of Wheat		Metres of cloth
Country A	either	1000	or	500
Country B	either	1200	or	2400

The pre-trade exchange ratios of wheat for cloth are then:

Country A	2 for 1
Country B	1 for 2

Although country B has an *absolute advantage* in the production of both goods, country A has a *comparative advantage* in the production of wheat. Providing that the countries can trade at an exchange ratio somewhere between 2:1 and 1:2 they will both gain from trade. Suppose that exchange occurs at a rate of 1:1 and assume that the opportunity costs of cloth in terms of wheat do not vary with output, i.e. that the production possibilities frontiers will be straight lines.



Suppose that before trade country A was consuming 200 units of wheat and 400 units of cloth, and that country B was consuming 400 units of wheat and 1600 units of cloth. By specialising in the product in which they have a comparative advantage and then trading, both countries could do better than this. For example, if they specialised completely and country A exchanged 600 units of wheat for 600 units of cloth produced by country B we would have:

CONSUMPTION BEFORE AND AFTER TRADE

	before trade	after trade
Country A	200W & 400C	400W & 600C
Country B	400W & 1600C	600W & 1800C

Various arguments have been given as to why it may nevertheless be necessary to implement protectionist policies, e.g.:

- the infant industries argument
- to ensure security of supply of essential goods that could otherwise only be sourced as imports
- to avoid the risk of specializing in (and having to rely on the trade in) goods that may have volatile prices or for which future demand is not assured
- to stimulate industries with a view to the positive externalities that industrialization might bring

4.

(a) Explain the meaning of the term externality and why externality problems are sometimes referred to as problems of "missing markets". [20%]

An externality refers to a situation in which the actions taken by one agent in an economic transaction affect the welfare (either positively or negatively) of another who is not directly involved in the transaction. In such situations prices do not reflect the full societal costs or benefits in production or consumption of a product or service, leading to market failure.

One way to think about externalities is to see them as arising from the absence of markets for certain things that economic agents care about (clean air or water, for example). Thus if a chemicals firm generates a negative externality by polluting a nearby river as part of its production activities, the externality arises because there is no market for the right to pollute (or not) the river water. If such a market did exist the firm would have to take into account the costs of its pollution when deciding upon its production patterns and an externality would not arise. These "missing markets" are often associated with the lack of well-defined (or enforced) property rights for the thing (air, water etc.) concerned.

(b) Explain the process by which direct bargaining between perpetrators and victims of a negative externality can secure a Pareto improvement. [40%]

This part of the question refers to the Coase theorem, according to which provided property rights are well defined and there are no transactions costs, bargaining over externalities will achieve an efficient outcome. The lectures went through a detailed example in order to illustrate the Coase theorem, based on Edgeworth-Box analysis of two individuals (one a smoker, one a non-smoker) who share a room. The key to this example is to show that, in the absence of well defined property rights, the outcome is unlikely to be Pareto efficient (it will only be efficient by chance). Once property rights are defined and allocated, the two individuals will be able to negotiate between themselves to reach an efficient outcome.

(c) From the perspective of the UK, outline the potential pros and cons of adopting the Euro. [40%]

There are many ways to answer this question, but a good place to begin would be with the idea of an optimum currency area (OCA). An OCA is a geographical region in which it would maximize economic efficiency to have the entire region share a single currency. The key requirements of an OCA is that member countries must not suffer from large asymmetrical shocks (i.e. recessions that only affect some members of a group of trading countries) and that they must have similar business cycles. If these conditions are met a 'one-size-fits-all' monetary policy may be feasible. Good answers will come to some

assessment whether the UK economy is similar enough to its European partner economies for a Euroland that includes the UK to be considered an OCA.

The benefits of a single currency within an OCA are then (microeconomic) that it reduces the cost of trade and improves price transparency and (macroeconomic) that it leads to lower and more stable inflation and to a lower 'sacrifice ratio'.

Good answers might also allude to Gordon Brown's famous five tests and briefly assess the extent to which they may or may not have been met:

- sustainable convergence between Britain and the economies of a single currency
- whether there is sufficient flexibility to cope with economic change
- the effect on investment
- the impact on our financial services industry, and
- whether it is good for employment.