

# **INSTITUTE AND FACULTY OF ACTUARIES**

## **EXAMINERS' REPORT**

April 2012 examinations

### **Subject CT7 – Business Economics Core Technical**

#### **Purpose of Examiners' Reports**

The Examiners' Report is written by the Principal Examiner with the aim of helping candidates, both those who are sitting the examination for the first time and who are using past papers as a revision aid, and also those who have previously failed the subject. The Examiners are charged by Council with examining the published syllabus. Although Examiners have access to the Core Reading, which is designed to interpret the syllabus, the Examiners are not required to examine the content of Core Reading. Notwithstanding that, the questions set, and the following comments, will generally be based on Core Reading.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report. Other valid approaches are always given appropriate credit; where there is a commonly used alternative approach, this is also noted in the report. For essay-style questions, and particularly the open-ended questions in the later subjects, this report contains all the points for which the Examiners awarded marks. This is much more than a model solution – it would be impossible to write down all the points in the report in the time allowed for the question.

T J Birse  
Chairman of the Board of Examiners

July 2012

## **General comments on Subject CT7**

The Business Economics examination paper includes different types of questions requiring a variety of styles of answers in the degree of detail required. The questions clarify the amount of detail necessary in the answer.

For questions requiring calculations with workings, full mark would only be awarded if workings are shown. Similarly, in questions requiring explanation, full mark will be awarded for providing adequate explanation. For essay questions, candidates are expected to include the relevant facts and issues *as well as* the linkages so that a direct and coherent answer to the specific question is provided. Thus, mere statement of facts and a general discussion of issues around the specific question will not be sufficient to gain a high mark. Where a question requires drawing diagrams and showing particular points or areas on the diagram, the diagram needs to be clearly drawn and labelled and clear explanation offered.

## **Comments on the April 2012 paper**

The paper was of a similar standard to the last two years' papers which test the new syllabus. The new syllabus, first introduced in 2010, includes a discussion of many new topics relevant to the world of business and to the economy as a whole. The paper, therefore, is balanced in favour of the more discursive type of questions. The syllabus places a greater emphasis on, and provides a greater scope for testing the candidate's discursive and analytical as well as technical skills.

The standard of the performance in this diet was similar to the previous diets. Candidates were generally able to provide correct answers to parts of the questions where these involved offering standard numerical solutions and diagrams, or listing of the relevant factors. However, where the answer was a variation on the standard calculation and diagrams, or required explanation of the concepts, answers were not as strong. Questions 38 involved a combination of application, diagrams and explanation and aimed to test the knowledge as well as a deeper understanding of the concepts and issues. However, very few candidates succeeded in providing the correct answer for this question. Candidates preparing for the examination for this subject are encouraged to focus on building strength in these areas.

A few candidates provided explanation for some of the questions in the multiple choice section. Providing explanation for multiple choice questions is unnecessary and will claim valuable time that needs to be spent on other sections.

Many diagrams offered in answer to question 30 would have benefited from more clarity or some explanation. Future candidates need to take note that where a question requires drawing diagrams and showing particular points, the diagram needs to be clearly drawn and labelled and clear explanation offered.

A number of candidates incorrectly provided the description for the product cycle instead of the business cycle in answering question 29. Future candidates are advised to read the questions carefully, since in economics similar terms often refer to entirely different concepts.

<b>1</b>	D
<b>2</b>	C
<b>3</b>	B
<b>4</b>	C
<b>5</b>	D
<b>6</b>	B
<b>7</b>	C
<b>8</b>	C
<b>9</b>	D
<b>10</b>	D
<b>11</b>	A
<b>12</b>	C
<b>13</b>	C
<b>14</b>	A
<b>15</b>	B
<b>16</b>	A
<b>17</b>	A
<b>18</b>	B
<b>19</b>	B
<b>20</b>	C
<b>21</b>	D
<b>22</b>	C
<b>23</b>	C
<b>24</b>	C
<b>25</b>	A
<b>26</b>	D

*The multiple choice section was generally answered well, although candidates found the questions in the first half of the section more challenging.*

- 27** (i) This is a measure of the responsiveness of the demand for one product to a change in the price of another (i.e. a substitute or complement). It is used to estimate how much the demand for one product will change in response to a change in price of the other good.

$$\text{CED} = \frac{\text{The percentage change in the demand for Good X}}{\text{The percentage change in the price of Good Y}}$$

If Goods X and Y are substitutes then demand for Good X will rise as the price of Good X rises. The cross price elasticity is positive. If X and Y are complements then the demand for Good X will fall as the price of Y rises. Cross price elasticity in this case is negative. A determinant of the CED will be the relative closeness of the two goods; the closer they are to one another the greater will be the effect of a change in price on the quantity demanded of the other good.

- (ii) (a)  $(300-260)/280 * 100 = 14.29$  (percentage change in quantity of Good X)  
 $(2.00-2.50)/2.25 * 100 = -22.22$  (percentage change in price of Good X)  
 $14.29/-22.22 = -0.64$
- (b)  $(320-260)/290 * 100 = 20.69$  (percentage change in quantity of Good X)  
 $(26,000-23,000)/24,500 * 100 = 12.2$  (percentage change in income)  
 $20.69/12.2 = 1.69$

*The alternative point method in calculating the elasticity was also accepted.*

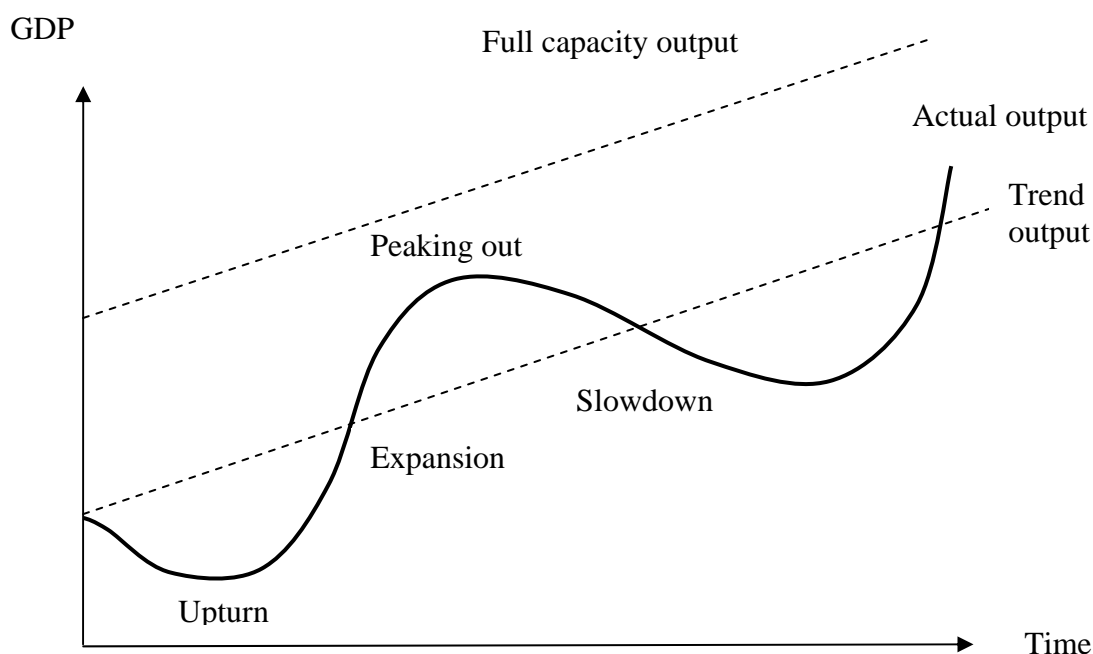
- (ii) (a)  $(\text{new-old})/\text{old} * 100$   
 $(300-260)/260 * 100 = 15.38$  (percentage change in quantity of Good X)  
 $(2.00-2.50)/2.50 * 100 = -20.00$  (percentage change in price of Good X)  
 $15.38/-20.00 = -0.77$
- (b)  $(320-260)/260 * 100 = 23.01$  (percentage change in quantity of Good X)  
 $(26,000-23,000)/23,000 * 100 = 13.04$  (percentage change in income)  
 $23.01/13.04 = 1.76$

*Although the majority of the answers presented the formula and a general explanation for the cross elasticity of demand, very few candidates mentioned substitutes and complements.*

- 28** (i) Total Revenue = 58 units  $\times$  £18 = £1044
- (ii) Total Cost = fixed costs + variable costs = £450 + (3  $\times$  £130) = £840
- (iii) Economic profit = Total Revenue – Total Cost = £1044 – £840 = £204

*This question was generally well answered.*

- 29** The answer may refer to the stages in any order. The diagram should show GDP on vertical axis and time on the horizontal, an upward sloping line to indicate trend output and a line fluctuating above and below this line to show actual GDP. Also it is necessary to indicate the appropriate points on the diagram.



Four phases:

**Upturn** – economy is in recovery and showing signs of growth following a recession/downturn. Also acceptable are Recovery or other phrases which are indicative of understanding that output is starting to rise following a period of recession/downturn.

**Expansion** – economic growth in this stage is more rapid and the economy may be “booming”. Actual output and potential output converge. Also acceptable is a discussion of growth rather than expansion, looking for an indication that output is growing and nearing potential output.

**Peaking out** – growth is slowing/peaking/ceases

Slowdown/recession/slump – little or no growth. A discussion of a recession provided that the correct definition is given is acceptable. Similarly a discussion of falling output and the resulting unemployment is acceptable.

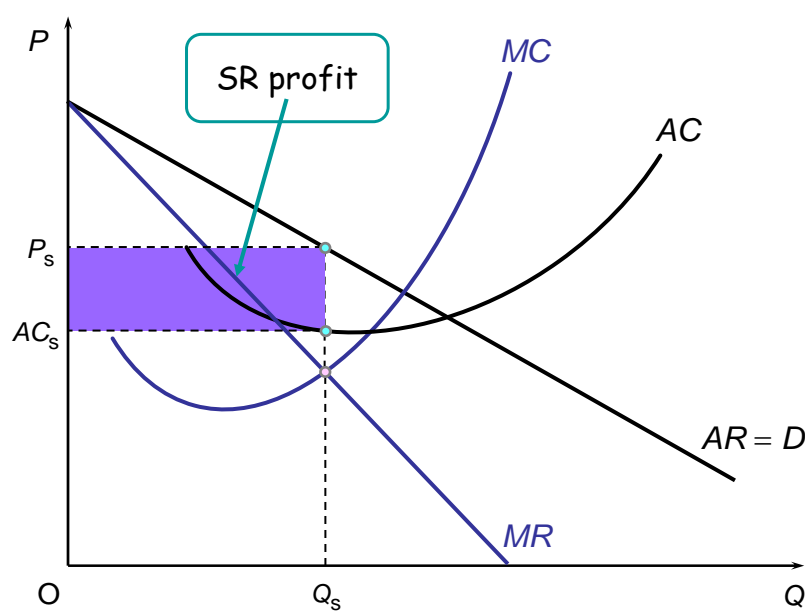
For each phase, candidates may offer a discussion of the reasons for the economy moving from one phase into the next, with possible reference to macroeconomic variables.

*In answering this question a number of candidates focussed on the product cycle, and not the business cycle as the question demanded. Other candidates answered the question well.*

**30** Diagrams below should clearly show:

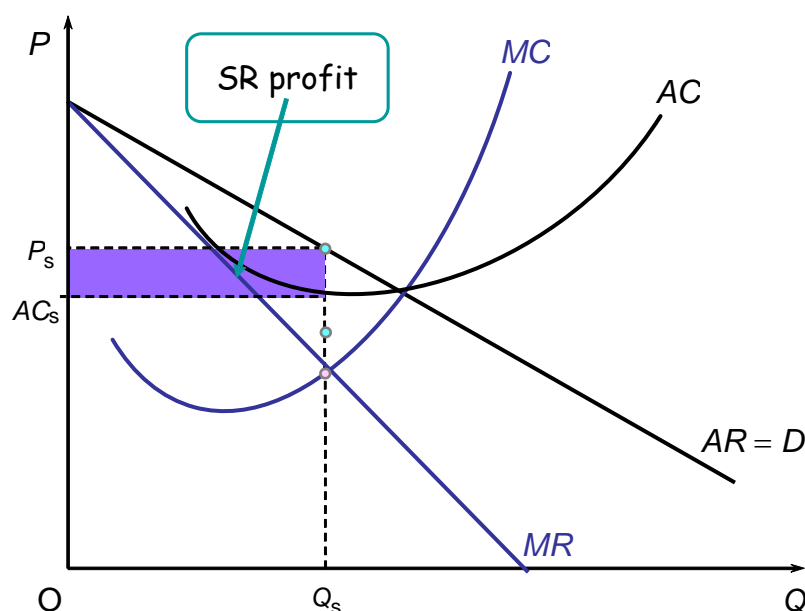
- (a) a line going through the profit maximising level of output (where  $MC=MR$ ) and extended upward to D, AR and then across to the price axis as shown by the line.
- (b) the area above the ATC curve and under the demand curve at the profit maximising price and quantity.

### Monopolistic Competition - short-run equilibrium



- (c) AC shifted upwards, no change in output or prices but leading to a reduction in profits as shown below or if it is move it to above AR then losses are incurred.

### Monopolistic Competition - short-run equilibrium



(Note: The answer to this part should be clearly shown using one or more diagrams.)

*This question was generally well answered. Some of the diagrams were not clearly labelled.*

- 31**
- (i) Risk neutral: a person takes a gamble when the odds are favourable and will not take a risk when the odds are unfavourable. The risk neutral person is indifferent about the gamble when the odds are fair.
  - (ii) Risk loving: a person is more willing to take a gamble even when the odds are unfavourable. The more risk loving the person is, the worse the odds that they are willing to accept.
  - (iii) Risk averse: a person may be unwilling to take a gamble even when the odds are favourable. The more risk averse the person is the better the odds need to be before the person will gamble. Few people are totally risk averse.

*This question was generally answered well, although in many cases, the examples provided by the candidates needed to be more specific with more explanation.*

- 32** (i)  $Y = C + I + G$ .  
 $I = £40\text{bn}$  and  $G = £20\text{bn}$  so  $Y - C = £60\text{bn}$  and therefore  $Y = £180\text{bn}$
- (ii) Withdrawn (see below)
- (iii) £20bn

Equilibrium national income, at £180bn, is £60bn below the full-employment level. Now injection multiplier =  $1/(1 - \text{mpc}) = 3$ . Change in  $G = \text{Change in } Y/\text{injection multiplier}$ , so the required increase in government expenditure is  $£60\text{bn}/3 = £20\text{bn}$ .

- (iv) Withdrawn (see below)

*Parts (i) and (iii) of this question were answered well. But there was an inconsistency in parts (ii) and (iv) of this question so parts (ii) and (iv) of the question were withdrawn and the marks for these parts were awarded to all candidates. The withdrawn parts accounted for only 3 marks. There was no evidence that candidates wasted time unnecessarily on the two withdrawn part questions.*

- 33** (i) The market may fail to provide an environment in which technological progress may take place for some of the following reasons:

R & D free riders – If firms can benefit from the R&D activities of other firms which carry risk and uncertainty, then firms may be less inclined to undertake R&D activity and may choose instead to free ride on others' activities. It is in firms' interest to keep R&D activities secret so that they reap the gains of such activities.

Monopolistic and oligopolistic market structures – In these market structures, large firms have less incentive to reduce costs and hence they engage in less R&D. Firms are able to afford R&D as they tend to be more profitable but have fewer incentives and hence engage in less R&D activity that aims to reduce costs. Generally competition provides more incentive to engage in R&D in order to reduce costs or to develop new products.

Duplication – As more firms engage in R&D activity, the likelihood of duplication increases which is a waste of resources. Given limited resources available for R&D, such resources need to be used as efficiently as possible.

Risk and uncertainty – Payoffs to R&D are highly uncertain and can be very costly. Activities which are low risk or those with clear market potential are likely to be undertaken leading to a lack of funding for longer term activities.



(ii) Policies used include:

Patent system – This system provides legal rights over products developed and hence encourages firms to engage in R&D activity.

Public provision – The government may provide the R&D activity itself to minimise some of the problems associated with free riders and duplication. This may be through its own research institutions or other organisations such as universities.

R&D subsidies – By providing subsidies to firms the cost of undertaking R&D activity is reduced. It is also possible that this may help diffuse R&D findings to others.

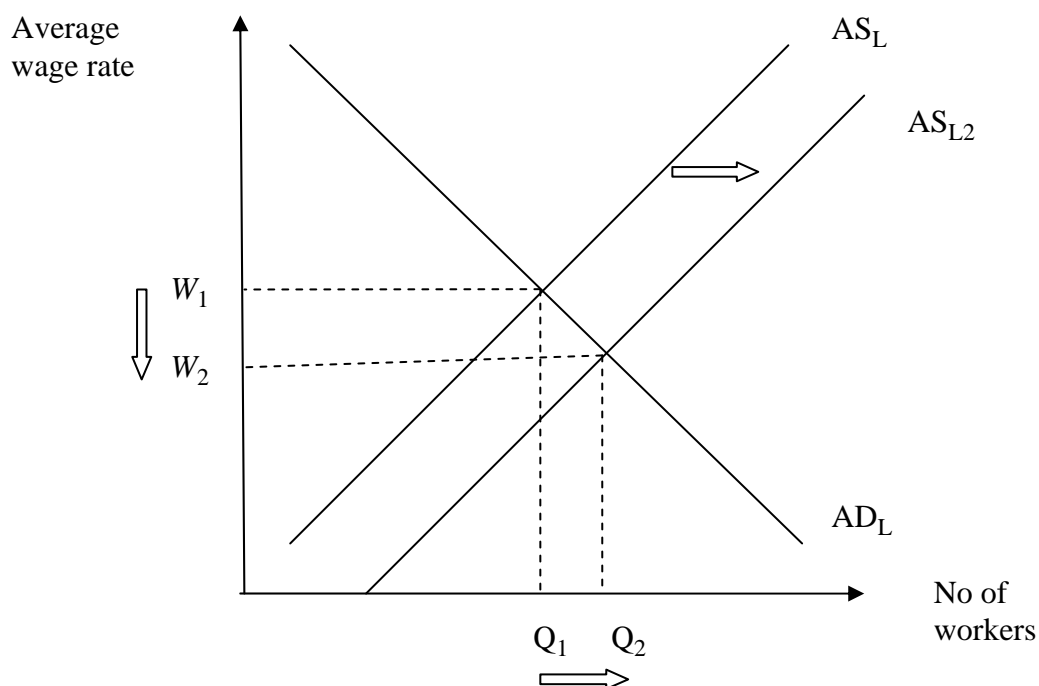
Cooperative R&D – The government may be directly involved in the R&D activity with a firm/firms or it may be the case that it helps firms come together to undertake R&D. Possible advantage is that this reduces duplication and helps to pool scarce resources.

Diffusion policies – Information about new technology and use of subsidies to help firms use new technology.

Other policies – Other policies which may influence R&D include education and training, competition policy, standards and compatibility

*This question was generally well answered.*

- 34** (i) (a) 60  
 (b) 50  
 (c) 330  
 (d)  $50 / (50 + 350) * 100 = 12.5\%$
- (ii) Following an increase in immigration, the labour supply curve will shift to the right. At the original wage there is a surplus of labour, there would be downward pressure on wages. Firms wish to hire more labour at lower wage rates and equilibrium is restored.



*This question was generally well answered.*

- 35** Two key characteristics are (i) non-rivalry and (ii) non-excludability.

Non rivalry – The consumption of a good by one person does not prevent the consumption of that good by anyone else. Goods have large external benefits of consumption relative to private benefits. This makes such goods socially desirable but these goods would not be profitable for individuals to provide for themselves – examples include pavements and street lighting.

Non-excludability – People reap the benefits of the good even if they have not paid for it. It is not possible to provide the good without others also benefiting and as a result, they have no incentive to pay for it. This creates the free rider problem.

*This question was generally well answered, and most candidates identified the two key characteristics correctly.*

**36** There are a number of categories of unemployment inter alia:

**Frictional** – is the irreducible minimum amount of unemployment caused by labour market turnover when new people enter the labour force and look for jobs and existing workers change jobs. Frictional unemployment is most easily identifiable when unemployment is low and the majority of the workforce has been unemployed only for a short time.

**Structural** – occurs because changes in the regional, occupational and industrial structure of the demand for labour do not match changes in the structure of the supply of labour. Changes in demand may be due to international competition e.g. shipping decline in UK or new technology e.g. motor car industry.

Structural unemployment is often associated with the decline of particular sector. Many of the unemployed are from particular declining sectors of an economy.

**Regional** – refers to the case where a whole region is in decline due to closure of one or more industries within the region. Regional unemployment is identifiable if the unemployment in a particular region is substantially higher than other regions of a country.

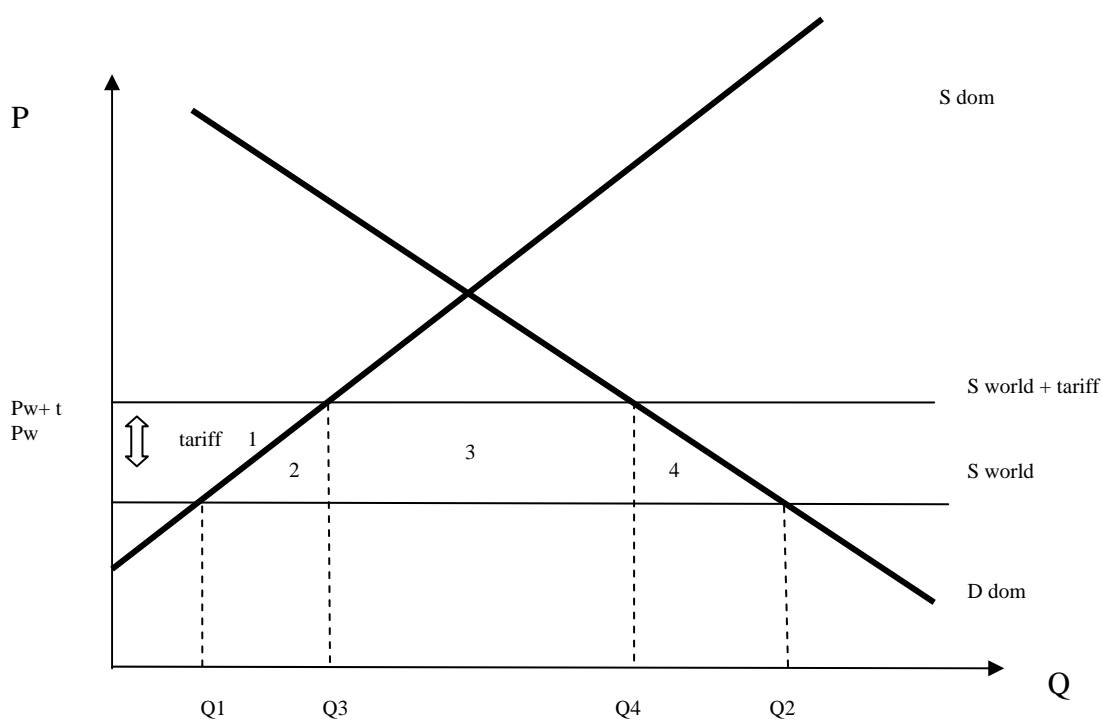
**Demand Deficient** – is due to insufficient aggregate demand in the economy as a whole so that full employment is not achieved. Demand deficient unemployment affects all regions but some are affected more than others. A sign of demand deficient unemployment is that the unemployment rate is quite high across the whole country.

**Real Wage Unemployment** – occurs because real wages are too high in relation to labour productivity. At the going real wage it does not pay for firms to employ all the labour force that is willing to work at the real wage. A sign of real wage unemployment can be that real wages have risen by more than can be justified by productivity increases.

Modern analysis also makes a distinction between **voluntary** and **involuntary** unemployment. Voluntarily unemployed are not willing to work at the going real wage rate while the involuntary unemployment would be prepared to, but cannot find work. One key factor that may raise the amount of voluntary unemployment is a rise in the net income with no work to net income when working ratio.

*This question was generally answered well.*

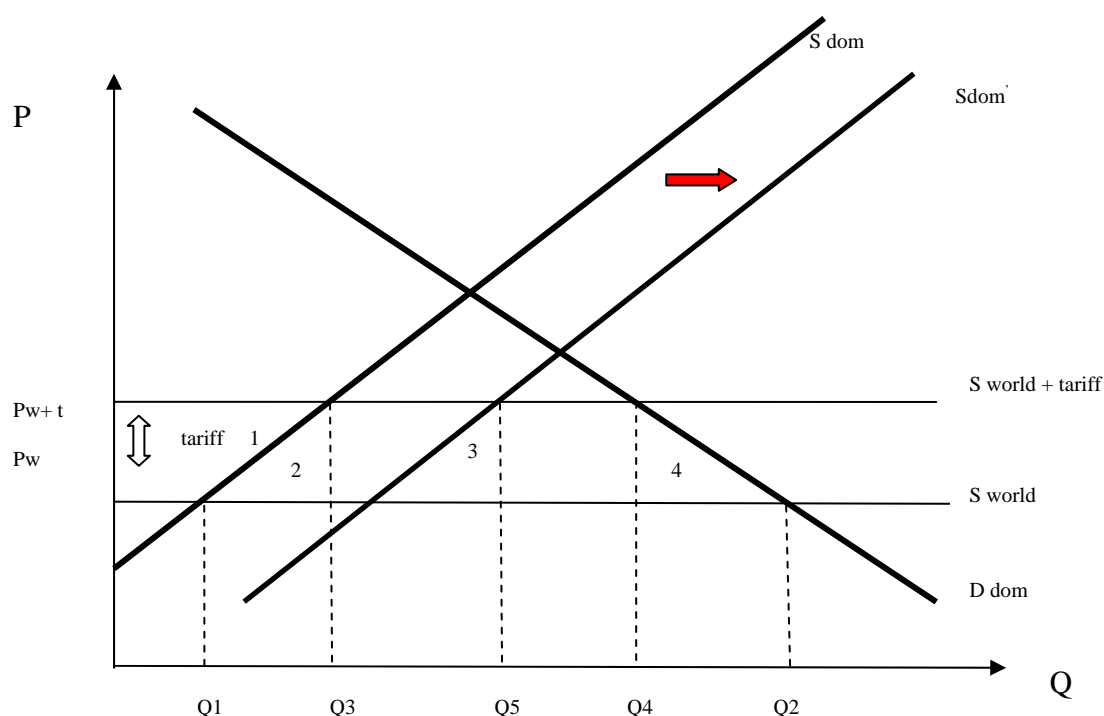
37 (i) and (ii)



$$\text{imports} = Q_2 - Q_1$$

- (iii) Reference should be made to the fact that following the tariff, the consumer would pay a higher price. Imports are now  $Q_4 - Q_3$ . Consumer surplus therefore falls – loss of areas 1 + 2 + 3 + 4. Part of this loss is redistributed to firms who now receive a higher price and gain additional profits (area 1). Government receives additional revenues from the tariff represented by area 3 (the amount of imports  $\times$  tariff). Some of the cost is not redistributed and therefore there is a net loss to society which is represented by areas 2 + 4.

- (iv) On the diagram below, the supply curve shifts to the right. Fewer imports are required as shown by the difference between Q5 and Q4.

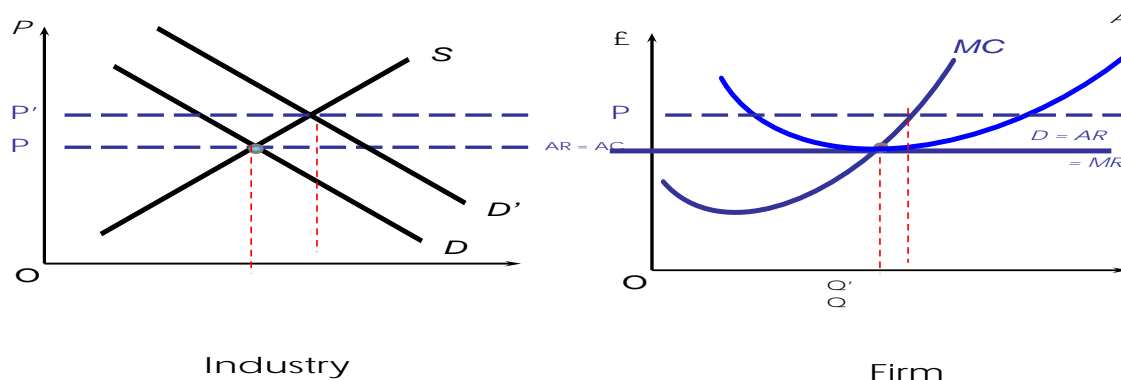


*This question was generally well answered. Most candidates drew the diagrams correctly but a few could not provide the required explanation.*

**38** (i) Perfect competition.

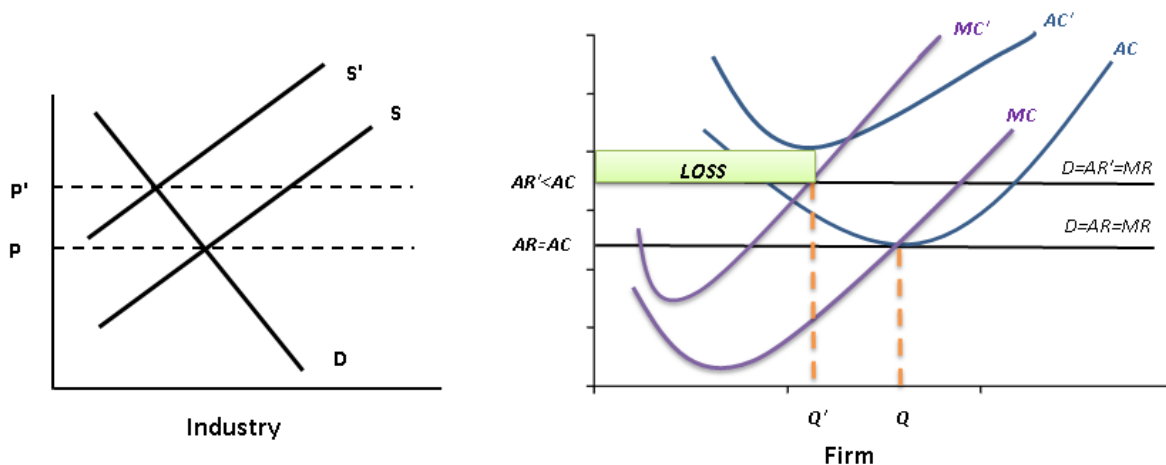
- (ii) (a) In the short run there would be a greater demand for taxis, demand shifts right for the industry and prices and quantity traded increase. For the firm, a new SR equilibrium experiencing abnormal profit would result. In the long run due to the characteristics of the market, new firms enter and normal profits are restored.

Short Run Equilibrium Perfect Competition



- (b) Starting from an initial equilibrium – The higher AVC would shift the supply line up and to the left. Therefore ATC and MC would all shift up resulting in higher prices and lower quantity traded. Losses would lead to firms exiting the market in the short run.

**Increased Variable Cost Perfect Competition**



- (c) An increase in fixed costs would result in ATC shifting up. There would be no change in output or price but losses are made (or if they have shown profits initially, then profits would fall). Losses would lead to firms exiting the market.

*In this question an application of the concepts was needed and the answers were not generally of a high standard. Drawing industry diagrams proved a challenge for most candidates and where correct diagrams were offered, the explanation given was often general or insufficient. Very few candidates answered part (c) of the question correctly.*

**END OF EXAMINERS' REPORT**