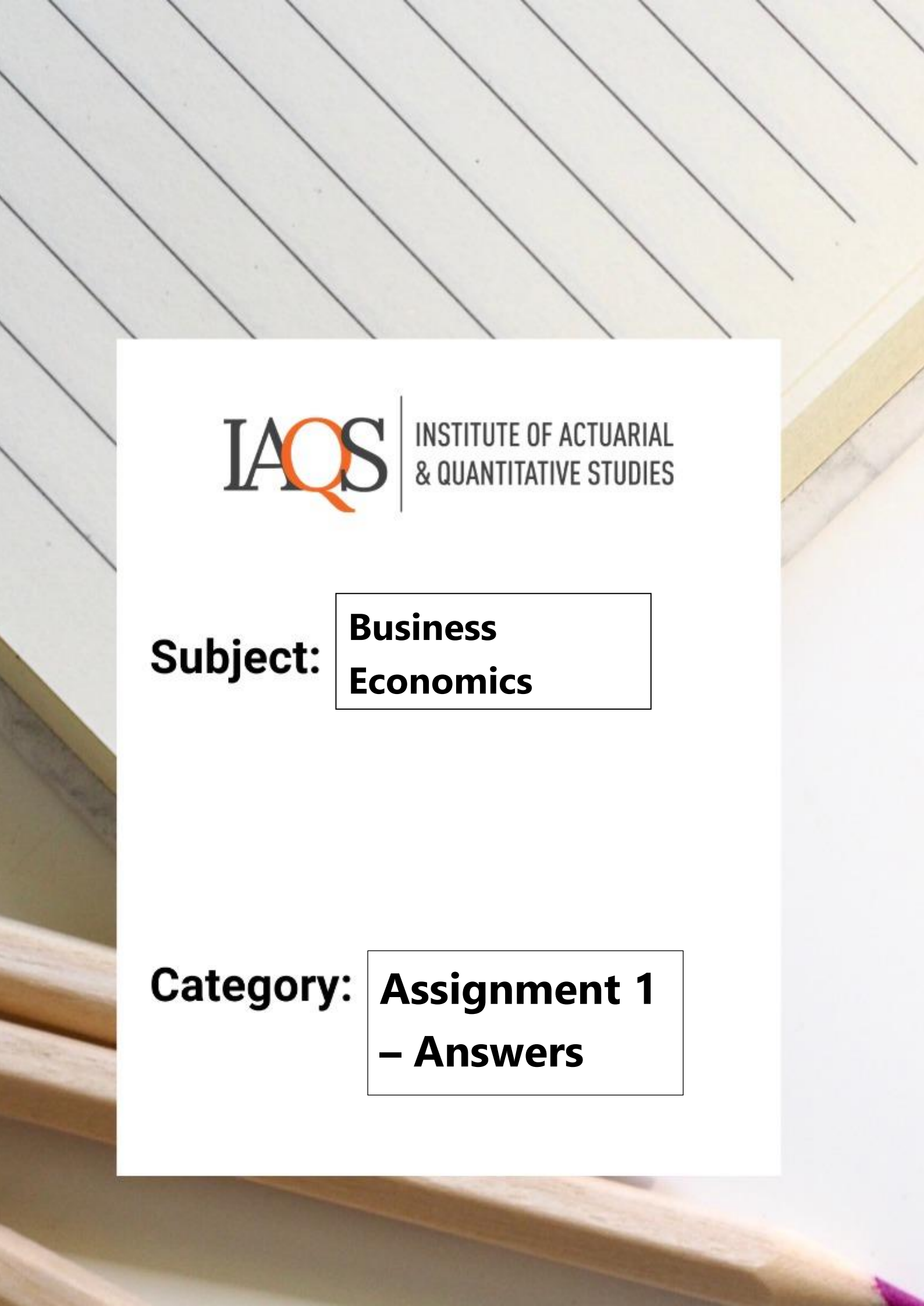


IAQS | INSTITUTE OF ACTUARIAL & QUANTITATIVE STUDIES

Subject: Business Economics

Category: Assignment 1 – Answers

1.

- Left to itself the market will equate supply and demand via changes in price. If the government intervenes in the pricing decision it may cause a disequilibrium to occur which is likely to have adverse consequences.
- An example of problems induced by setting a price floor or minimum guaranteed price is in the agricultural market. When governments set a high guaranteed minimum price for agricultural output which is above the free market price there are two effects Consumers face higher food prices and cut back on consumption and farmers are encouraged to increase agricultural output. The result is an agricultural surplus, the government has to purchase the surplus and then decide what to do with it, it might store it but this is costly, it might give it away or it might dump the food on the world market. The policy while highly beneficial to farmers will damage the interests of consumers.
- A price ceiling (maximum permissible price) that is set below the free market price will also cause problems. For example, in the housing rental market governments sometimes set maximum rents below the free market rent that equated the supply and demand in the market. The effect of the rental control is that the supply of rented housing falls while the demand for rented housing rises resulting in a shortage of housing. The rental controls are to the benefit of those that are able to obtain rented accommodation but mean that many people are unable to do so. All in all, there can be little doubt that while government intervention in the free market can be beneficial in some respects the interventions can harm the interests of other parties and create problems of surpluses and shortages which are invariably inefficient. To obtain rented accommodation. The shortage problem will then have to be solved either by some means of rationing and the government might find itself under pressure to build new subsidised housing. Another possibility is that landlords will try to get around the rent controls either by charging for other items such as furniture rather than the accommodation. One might also witness the emergence of a black market for housing.

2. A. PES = % change in quantity supplied/% change in price or %Δ in Qs/%Δ in P
All three methods below are acceptable:

- The arc method gives:

$$\frac{dQs}{dP} \times \frac{P}{Q} = \frac{200}{3} \times \frac{6.5}{300} = 1.44$$

- At price 5 the point elasticity is:

$$\frac{dQs}{dP} \times \frac{P}{Q} = \frac{200}{3} \times \frac{5}{200} = 1.67$$

At price 8 the point elasticity is:

$$\frac{dQs}{dP} \times \frac{P}{Q} = \frac{200}{3} \times \frac{8}{400} = 1.33$$

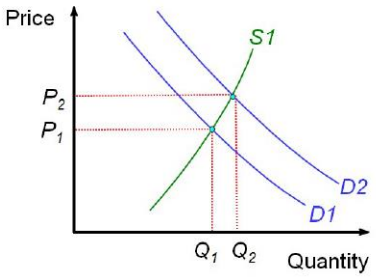
B. Three factors could include:

- The time period - PES is usually more elastic in the long rather than the short run. In the short run firms would find it difficult to change their output in response to a change in price as it is difficult to adjust input levels; the size of the workforce or factory. In the long run, firms can change the workforce, raw materials and build new factories. Hence, in the long run supply should be much more responsive to changes in price.
- Productive capacity - In the short run, firms tend to have a finite capacity given the factors of production. Firms may be unable to expand when the economy is at its peak and/or growth has been strong. When the economy is growing more slowly or contracting firms may have some spare capacity and thus be able to respond more readily to changes in prices.
- The size of the industry - Supply tends to be more elastic in smaller firms. Increased purchases of raw materials on a small scale are unlikely to impact unit costs, whereas large firms buying larger quantities of raw materials could influence the price of raw materials and raise unit costs. The more firms there are in the industry the easier it is to increase supply.
- Mobility of factors of production - The more readily a resource can be used for other purposes the more elastic supply will be, land which can be easily switched from one crop to another for example or firms with plants across the globe so that disruption at one can be managed at another to ensure that production continues. Labour in

particular fields cannot be switched so readily, heart surgeons cannot readily be renal surgeons as it's a very different type of medicine and supply is much more inelastic.

- Ease of storing stock and inventory - If firms have the facility to store stock then they can respond to changes in price very quickly. If building up stock and inventory is cheap then firms would have more elastic supply. For others the cost of storage could be prohibitive or the good could be perishable and thus not suitable for storage and therefore supply would be relatively inelastic.
- Barriers to entry - The lower the barriers to entry to produce the product the more easily new firms can enter and supply the product which increases the price elasticity of supply.

3. (i)



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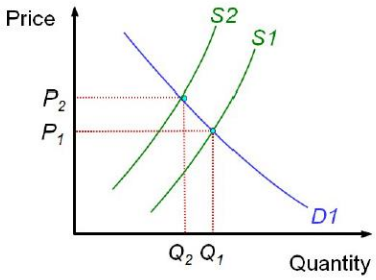

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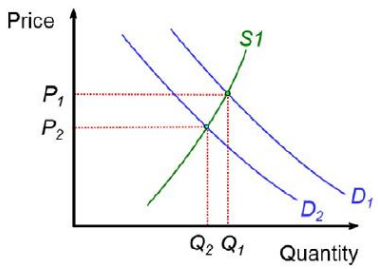

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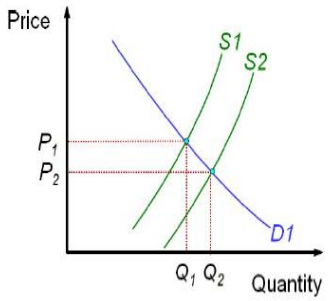


4.

i. 173 or 1.73 are acceptable answers
ii. 1.19
iii. A = 0.34, B = normal good
iv. A = 1.60, B = complements

5.

i. Factors of production are:
Human resources/labour, natural resources/land and raw materials and manufactured resources/capital.'

ii. Human resources can be scarce in terms of the number of people and/or the skills that they have.
Natural resources may be scarce as land is limited and the raw materials that come from the land may also be limited.
Manufactured resources may be scarce as there are a limited number of machines, equipment, transportation and factories. The productivity of the capital is also limited by the state of technology.

6.

i. Risk is when the probability of an outcome occurring is known. In contrast uncertainty refers to a situation in which the probability of an outcome is not known.

ii. Reference may be made to holding stocks – suppliers hold additional stocks in anticipation of potential changes in price or demand.
For example, if farmers hold stocks of a good such as wheat, if the price is low in the market they can hold onto some stock and then release it to the market once prices rise and vice versa.
OR
Alternatively, one can purchase information.
This could be from market research, specialist sources/organisations.
Additional information about the market may help to reduce uncertainty. An important point to note is that such information must be reliable in order to reduce uncertainty.

7.

(i)
$- dQ/dP * P/Q = -(1/2) * 16/2 = -4$

(ii)
£6-£10

(iii)
Arc elasticity is $- dQ/dP *$(average P/average Q)
$= (-2/4) * 10/5 = -1$

(iv)
The Goods are complementary goods

(v)
The cross-price elasticity of demand is -0.5

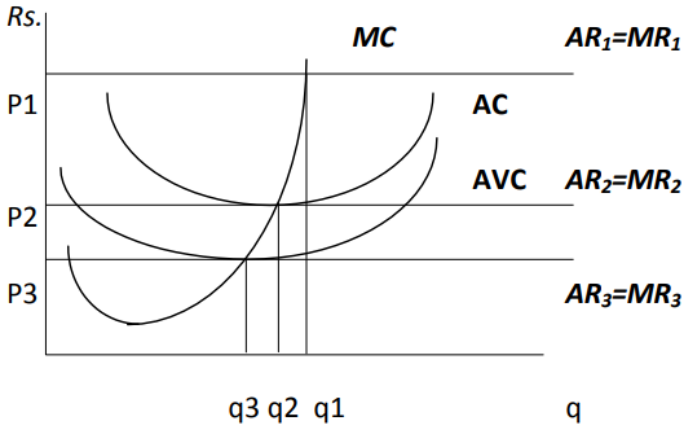
8. i) The law of diminishing marginal returns states that when increasing amounts of a variable factor are used with a given amount of a fixed factor, there will come a point when each extra unit of the variable factor will produce less extra output than the previous unit.

ii) Where costs per unit of output increase as the scale of production increases

iii)

- The law of diminishing returns is applicable only to the short run.
- One factor of production (normally capital) is assumed to be fixed and one factor of production (normally labour) is variable. Diminishing returns eventually occur as the input of the variable factor of production is raised, which results in diminishing marginal and average product of the variable factor of production. Diminishing returns imply that short run average and marginal cost curves will eventually slope upwards.
- Diseconomies of scale are applicable only to the long run average cost curve.
- All factors of production are variable in the long run and in the presence of diseconomies of scale long run average cost rises as output is increased. Diseconomies of scale mean that if all factors of production are increased in equal proportions output rises less than proportionately. Many reasons can be cited for diseconomies of scale e.g. bureaucracy of large businesses, worker alienation etc.

9. i) Main assumptions are: a. Since each firm has a tiny fraction of the market, all firms are price takers. b. There is complete freedom of entry into the industry. c. Firms produce an identical (homogeneous) product. d. There is perfect knowledge in the market
ii) A firm's short-run supply curve can be derived by considering how much the firm will produce in the short run at different price levels.



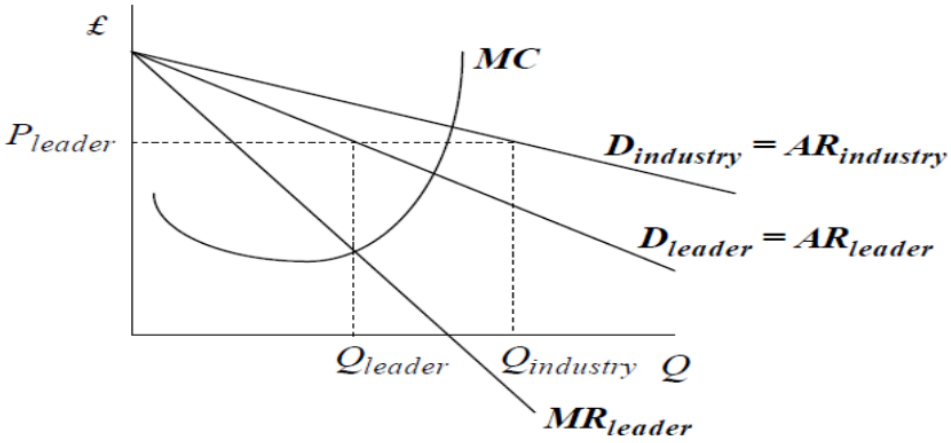
If:
● the price is P1, then the firm will produce where MR = MC , ie at q1 – at this price, the firm makes supernormal profit since price exceeds average cost

● the price is P2, then the firm will produce where MR = MC , ie at q2 – at this price, the firm makes normal profit since price is equal to average cost
● the price is P3, then the firm will produce where MR = MC , ie at q3 – at this price (or any price between P2 and P3), the firm makes less than normal profit, but it carries on in the short run because price exceeds AVC
● the price is below P3, then the firm will supply nothing, since the price does not even cover its average variable cost.

Therefore, the firm's short-run supply curve is the MC curve above minimum AVC. At prices below minimum AVC, the firm will supply nothing.

10. (i)
a. There are few players
b. Barriers to entry – Regulatory, Huge set up cost
c. Interdependence of airlines – airlines are affected by its rivals' decisions and likewise, its decisions affect its rivals – price wars
d. Product differentiation –No frill flights, discount on advance bookings
e. Price setter

(ii) Firms (the followers) choose the same price as that set by a dominant firm in the industry (the leader) In order to set the price, the leader may need to make assumptions, e.g. that it will maintain a constant market share. These assumptions may or may not hold in practice.



The leader sets its price at the output level (Q_{leader}) where it's $MR = MC$. The rest of the industry adopts the same price (P_{leader}).

The industry quantity ($Q_{industry}$) is determined by the market demand curve ($D_{industry}$).

11.

You are the manager of a monopoly, and your demand and cost functions are given by P = 200 -2Q and $C(Q) = 2000 + 3Q^2$, respectively.

a)

$TR = P*Q = (200-2Q)Q = 200Q - 2Q^2$
$MR = 200 - 4Q$
$TC = 2000+3Q^2$
$MC = 6Q$
$MR = MC$
$200- 4Q = 6Q$
$10Q = 200$

$Q = 20$ (Profit maximizing level of output)
$P = 200 - 2*20 = 200 - 40 = 160.$

b)

Profits = TR – TC
160 X 20 – (2000 + 3* 20*20) = 3200 – 3200 = 0 (firm is earning only normal profits) [1 mark]

c)

PED = - 1/2 * 160/ 20 = -4 (it is elastic) .

d)

Revenue is maximized when TR is maximum which is only possible when MR=0.
MR= 200- 4Q = 0
Q = 50 (revenue maximization level of output)
P = 200 – 2* 50 = 200 – 100 = 100

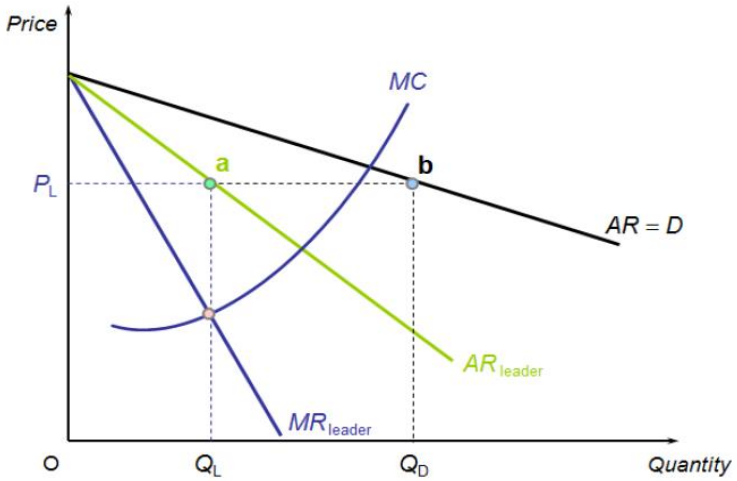
e)

The revenue is maximum when firm is producing 50 units and selling it at a price of 100
50 * 100 = 5000

f)

PED = -1/2 * 100/50 = - 1 (Unitary)

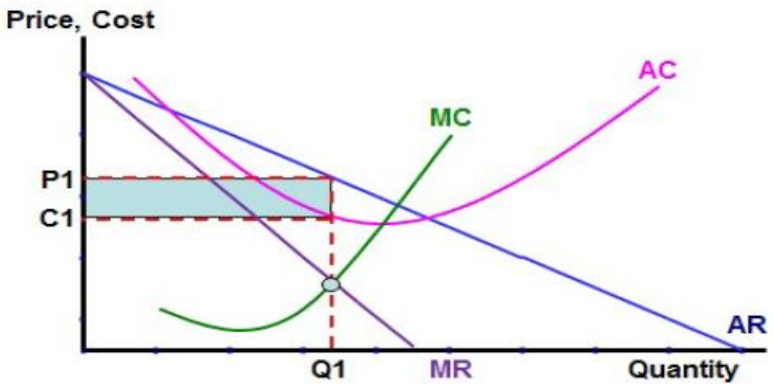
12.



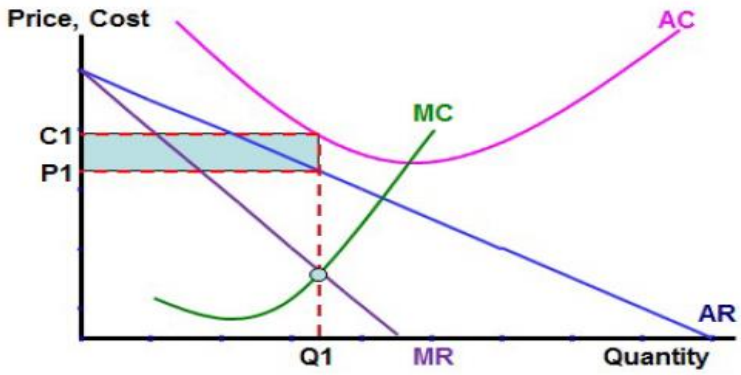
In the above diagram the market demand curve is given by D, the leading firm sets its market share as given by AR(leader) with the resulting marginal revenue MR(leader). Its optimal price is found by equating its marginal cost MC to its marginal revenue, giving price PL and output QL. At price PL total market demand is QD with the follower firms supplying QLQD.

13.

i. Excess Profits



ii. Excess Loss



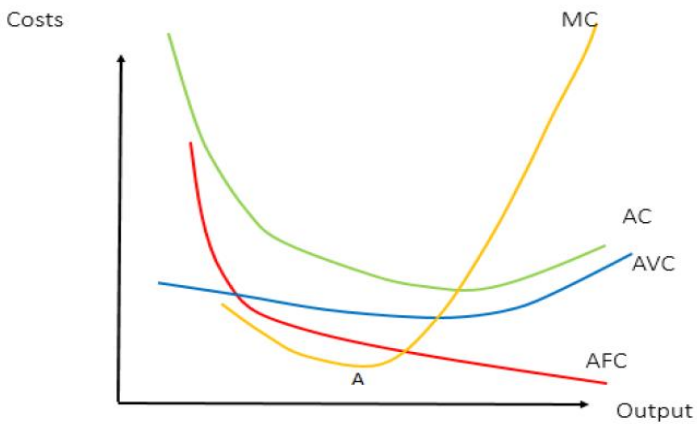
iii. In the long run because of the absence of barriers to entry there will be no excess profits and only normal profits will be made.

14.

i.

- A fixed cost for a cafe is any cost that does not vary with output for example the insurance, repayment on a loan for the premises or rent. Other appropriate costs could be standing charges on gas/electricity, telephone line/broadband.
- A variable cost for the cafe is any cost that varies directly with output. Therefore, inputs such as coffee, sugar, milk are good examples. If staff are paid hourly then that could also be appropriate as it will depend on how busy the cafe is and thus how many staff are on shift at any one time.

ii.



iii.

(a) Diminishing returns may be experienced in a cafe as they have a limited number of machines and the baristas may have to queue to get to a machine. The same issue could arise with processing bills, there is likely to only be one till and many staff could need to access it at once.

(b) Point A on the diagram is where diminishing marginal returns set in. Point A is at the minimum point of the MC curve.

15.

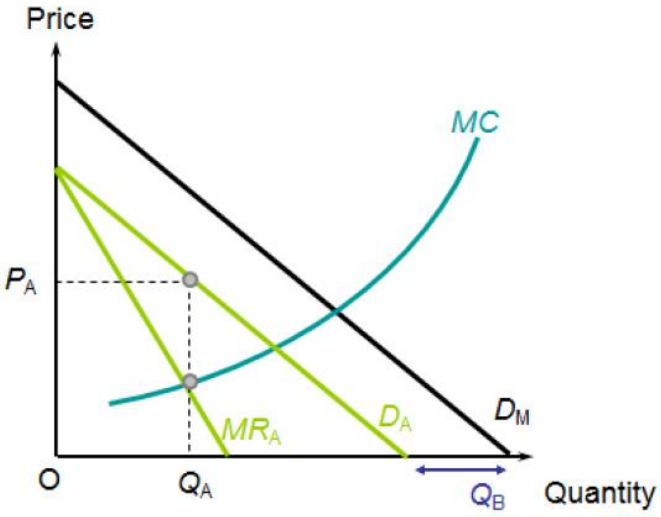
i. Price discrimination occurs when firms sell the same product at different prices where the cost of supplying to different customers does not vary or the difference in price is not accounted for fully by any difference in the costs of supply. Price discrimination can be exercised in relation to types of markets geographically, types of consumers or the quantity purchased.

ii. Price discrimination is less effective when goods can easily be resold into different markets, for example medications can be purchased by a consumer and later sold at a higher price on black markets to another. Price discrimination is not possible in this case. Medical treatment however is a service, it is received by an individual and cannot be performed on another. As a medical procedure cannot be resold in this way it is possible to charge different prices. For example, if a poor person pays a lower price for a dental filling than a rich person then they cannot resell their treatment to a rich person and charge a higher price for a filling. Whereas with a pharmaceutical product e.g. drug treatment for a disease, the price discrimination is harder because people can buy the product in the low cost market and resell it at a higher price in the high cost market. Another possible way to answer this question is to emphasize the control of supply. So for example, highly skilled heart surgeons have skills to operate on patients that few others have so they can easily price discriminate whereas a drug can easily be copied by making a generic version (even if it violates the intellectual property/ patent rights of the drug producer).

16.

i. In the Cournot model each firm assumes that the other firm produces a given amount of output and deducts this amount at each price from the market demand curve to arrive at its own demand curve and then sets its profit maximising output.

ii. Firm A assumes Firm B produces QB. It deducts this amount at each price from the market demand curve DM to arrive at its own demand curve DA and associated marginal revenue curve MRA. It will then equate its marginal revenue (MRA) to its marginal cost (MC) giving the resulting equilibrium price and output are PA and QA respectively.



17.

i. Collusive oligopoly is a situation when firms in an oligopoly agree to limit competition between themselves by such practices as agreeing on each keeping its market share, price fixing, setting output quota or limiting advertising.

ii. Firms who are looking to work together (be collusive) work best under the following conditions.
- Very few firms – on a particular route or within a country/set of countries, the two airlines would find collusion easier if there are as few other competitors as possible.
- Open about costs and production methods – the more open and honest the two airlines are with one another the better idea the two will have about whether they can work together.
- Similar production methods and average costs – by having similar methods of operation, they are more similar and therefore price changes from one can easily be reflected in another.
- Similar products – the two firms ideally need to offer the same sort of product, one offering long haul and the other short haul for example may not be compatible. The need to be able to

agree on price and the more similar the produce the easier this is and the less is the incentive for diverging from an agreement.

- Significant barriers to entry – both the airlines need to be able to keep other firms out of the market as a competitor could present an opportunity for breaking an agreement.
- No government measures to curb collusion – in a market where the government has little control over the ability of firms within the airline industry to collude, the two firms would find it more favourable to do so.

18.

i. £10
ii. £10
iii. It is called a dominant strategy game since regardless of what the other player does a particular strategy earns a player a larger payoff than any other strategy. In this case for Company A its dominant strategy is to charge £10 as this results in higher profits than charging £15 regardless of what Company B does. Similarly, for Company B, its dominant strategy is to charge £10, as this results in higher profits than charging £15 regardless of what Company A does.
iv. Both charge £10 and the profit for each company is £8 million.

19.

i. C
ii. B, C, D
iii. D
iv. A, B

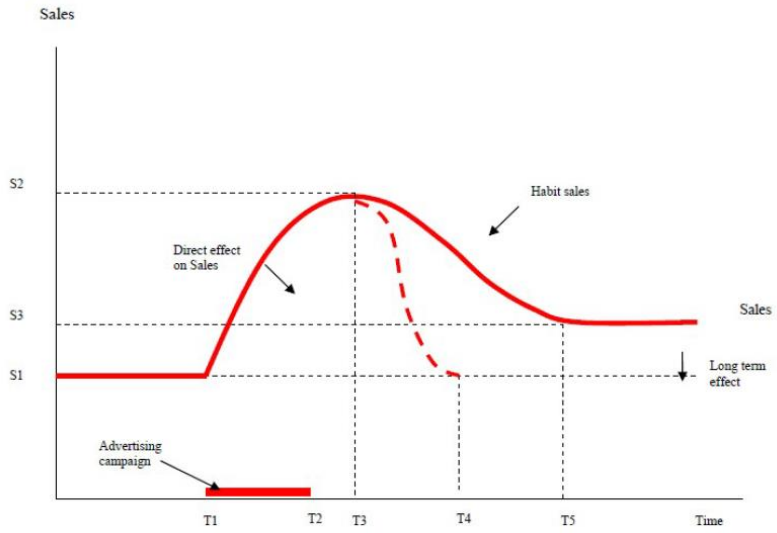
20.

i. A supermarket can differentiate its product in various ways these include:
Quality – some supermarkets offer a high quality more expensive product offering while others settle for a lower price lower quality product offering.
Range of products offered – some supermarkets offer a small range of products at very competitive prices while others offer a wider range of products at generally higher prices. Some supermarkets offer both branded products and own brands catering for consumers with both high and low incomes.
Service – some supermarkets offer a high quality of service with speedy checkouts, well maintained stores and rewarding loyal customers while others tend to offer poorer service levels.

Location – some supermarkets specialise in giving their customers convenient access to their stores including parking facilities and placing smaller stores in prime locations close to residents. Other supermarkets do not offer car parking and are located in less prime areas.
Advertising – even if two supermarkets have broadly similar products through a successful advertising campaign a supermarket can differentiate the perceived quality of its product offering. Advertising can also be used also attract consumers from a target category such as more affluent consumers, families with children and consumers of a certain age range.
Pricing and special offers can be an effective means of differentiating the products, some supermarkets specialize in lower price product ranges while others have a high price but better products and customer experience.
Design and technical standards can also affect supermarkets, for example some have a higher proportion of frozen foods while others have a tendency to offer fresh food. Then there is organic versus non organic food.

ii. Explanation of the following factors for a rise in popularity of own brand Products include:
Cost – Branded manufacturers' low costs due to economies of scale have been matched by supermarkets because of improvements in technology and close links between suppliers and retailers.
Quality – Supermarkets have introduced higher quality own brand products to compete with the branded manufacturers. Surveys show that consumers perceive their own brand products to be better value than branded products.
The state of the economy – An important factor in deciding to buy own-brand products is consumers' income. In the recession following the financial crisis of 2008, sales of own brands grew as consumers become price sensitive seeking good value products.
Advertising by supermarkets as well as the shelf space they devote to their own products has helped supermarket own brands increase their sales.
Also competition between supermarkets since the 2008 recession has meant that they have been keen to keep overall household shopping bills down so as to maintain their market share.

iii.



Initially an advertising campaign at time T1 is likely to push up sales of a product particularly as the campaign gets wider coverage and some consumers recommend the product for other consumers to buy. The impact on profitability of a successful campaign in the short run is likely to be positive as advertising expenditure relative to competitors will enhance product image and company reputation leading to enhanced perceived relative quality of offering in relation to its price. The enhanced customer perception of the product will increase market share which leads to higher profit margin as well as sales growth.

Once the advertising campaign ceases there are two possibilities, one is that sales drop off quite quickly and there is no long run effect with sales returning back to roughly the original level (see dotted line). However, a more likely scenario is that some consumers that purchased the product are likely to continue to purchase the product, so called habit sales, while other new consumers might switch back to other brands. In this latter scenario, total sales will gradually decline over time but the long run sales levels will be above the original level.

Of course, the above assumes no reaction by other supermarkets to an advertising campaign. If they react to the advertising campaign, then the likely effects of the advertising campaign on sales will be somewhat diminished.