

Institute of Actuaries of India

Subject CT7 – Business Economics

October 2014 Examination

INDICATIVE SOLUTION

Introduction

The indicative solution has been written by the Examiners with the aim of helping candidates. The solutions given are only indicative. It is realized that there could be other points as valid answers and examiner have given credit for any alternative approach or interpretation which they consider to be reasonable.

Multiple Choice Questions (1 to 30): 1.5 Mark each

1. A
2. C
3. C
4. B
5. D
6. B
7. C
8. B
9. B
10. A
11. B
12. C
13. B
14. D
15. C
16. B
17. D
18. D
19. A
20. C
21. A
22. C
23. D
24. A
25. C
26. C
27. D
28. D
29. A
30. C

[Q.No. 1 to 30=45 Marks]

Solution 31:-

(i) The equilibrium price is the price at which demand equals supply.

$$25 - 4P = 1 + 2P$$

$$\text{Or, } 6P = 24$$

$$\text{Or, } P = 4$$

At any price above the equilibrium price, a surplus of supply over demand will arise.

That is, for $P > 4$, there will be surplus of supply over demand.

[2]

(ii) New equilibrium price would fall.

Addition of substitute would lead to fall in demand for a given price. If supply curve remains unchanged, then there would be excess supply at the earlier equilibrium price. For the market to clear now, price should fall. [2]

[4 Marks]

Solution 32:-

The maximum premium (P) which the magician will be prepared to pay can be calculated by equating the expected value of his utility without insurance with his utility with insurance and solving for premium P :

$$\begin{aligned} \text{Expected value of his utility without insurance} &= 0.998 \times U(40000) + 0.002 \times U(0) \\ &= 0.998 \times (10 + 40000^{0.5}) + 0.002 \times (10 + 0^{0.5}) \\ &= 0.998 \times (10 + 200) + 0.002 \times (10) \\ &= \dots\dots\dots 209.6 \\ &\dots\dots\dots (i) \end{aligned}$$

$$\begin{aligned} \text{His utility with insurance} &= U(40000 - P) \\ &= 10 + (40000 - P)^{0.5} \dots\dots\dots (ii) \end{aligned}$$

Equating equations (i) and (ii) and solving for P , we get

$$10 + (40000 - P)^{0.5} = 209.6$$

$$\text{Or, } 40000 - P = 199.6^2$$

$$\text{Or, } P = 40000 - 39840.16 = 159.84$$

[4 Marks]

Solution 33:-

$$(i) \text{ TR} = 32Q - 2Q^2 \text{ and } \text{TC} = 2Q + Q^2 + 3$$

$$\text{MR} = 32 - 4Q \text{ and } \text{MC} = 2 + 2Q$$

Profit maximising criteria: $\text{MR} = \text{MC}$

$$\text{i.e. } 32 - 4Q = 2 + 2Q$$

Or, $Q = 5 = \text{Maximum profit output}$

$$\text{Total Profit} = \text{TR} - \text{TC} = 32Q - 2Q^2 - 2Q - Q^2 - 3 = 30Q - 3Q^2 - 3$$

Amount of profit when Q is 5 = 72.

Alternate Solution:

$$\text{TR} = 32Q - 2Q^2 \text{ and } \text{TC} = 2Q + Q^2 + 3$$

$$\text{Total Profit} = \text{TR} - \text{TC} = 32Q - 2Q^2 - 2Q - Q^2 - 3 = 30Q - 3Q^2 - 3$$

Profit would be maximised when first derivative of total profit with respect to Q is zero.

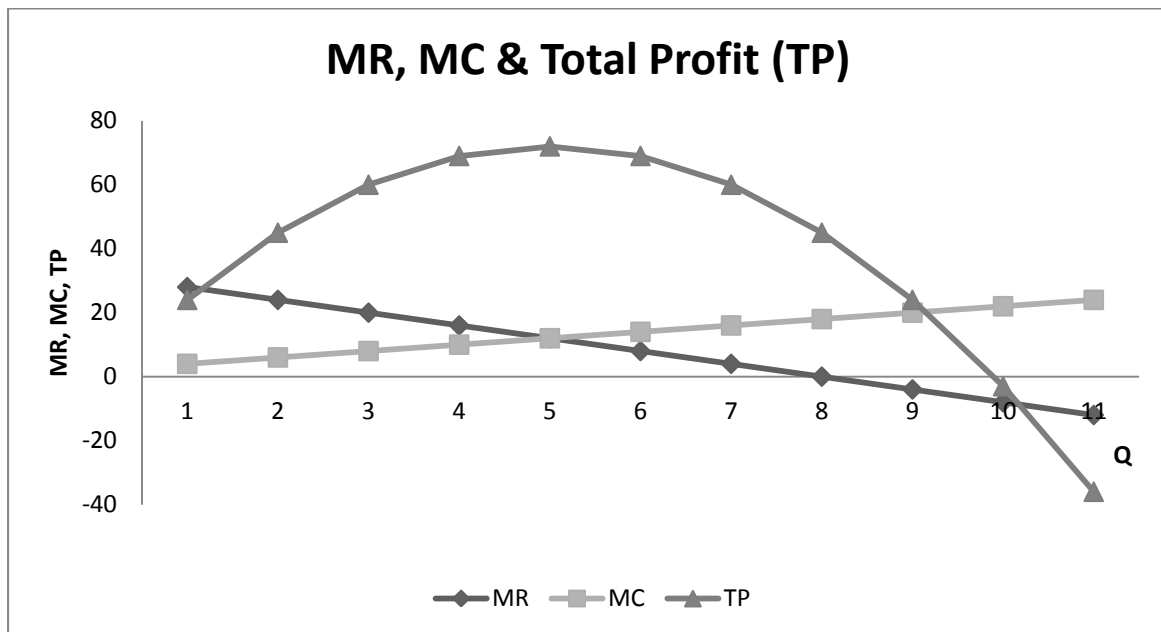
$$\text{i.e. } 30 - 6Q = 0$$

Or, $Q = 5 = \text{Maximum profit output}$

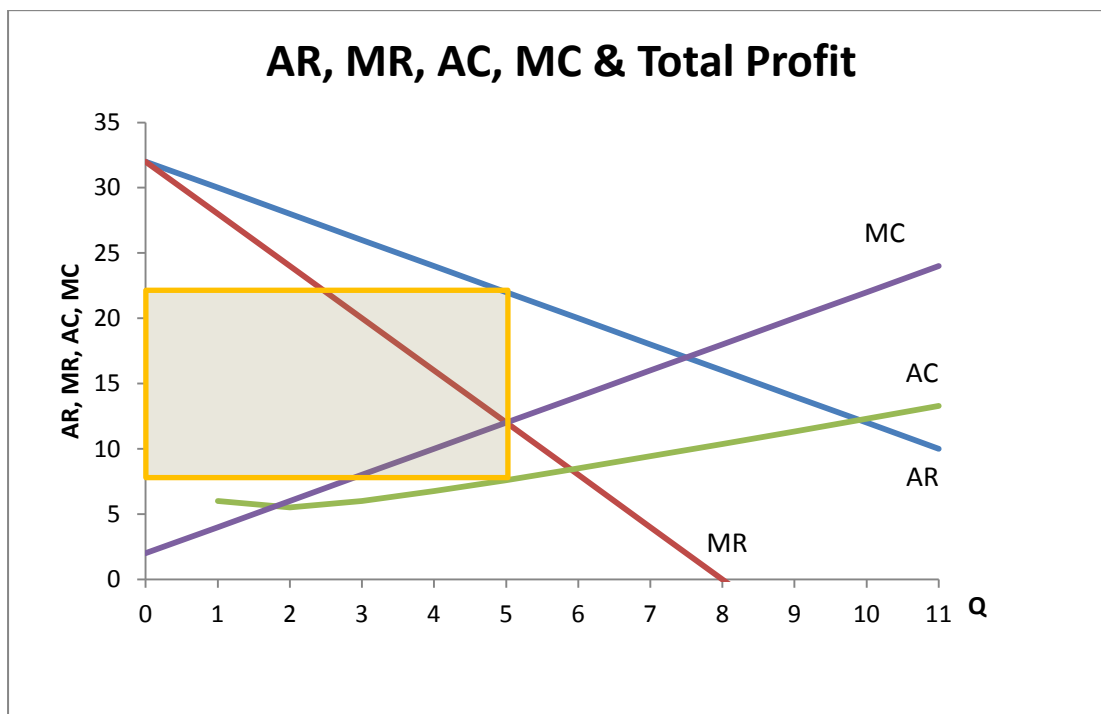
Amount of profit when Q is 5 = 72.

[3]

(ii) Graph:



Alternate Solution:



At $Q = 5$, $MR = MC$. Hence, profit output is 5.

Profit = Area of shaded region = $5 \times 14.4 = 72$

[Also, MR and MC should be straight line curves. If the candidate has drawn curves (generic) then marks should be deducted.]

[3.5]

[6.5 Marks]

Solution 34:

- i. New markets – This would enable both the companies to enter into Indian cement market.
- ii. Risk sharing – Both firms can share risks between them and hence can start operations on a larger scale.
- iii. Capital pooling – Both firms can raise the large amounts of capital needed, if needed.
- iv. Cost – This may be a quicker and cheaper way to enter into cement market than a potentially costly merger or takeover.

[4 Marks]

Solution 35:

(i)

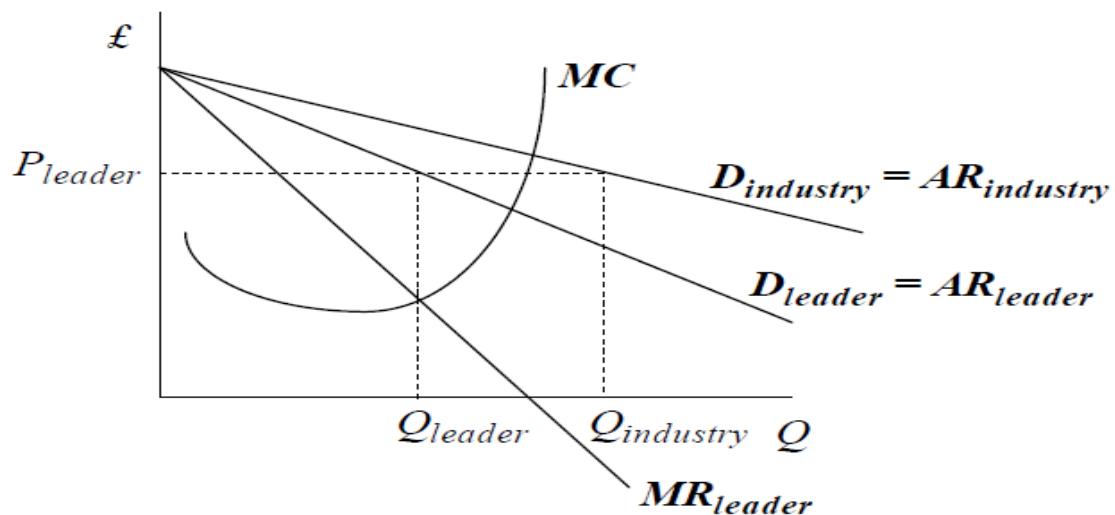
- a. There are few players
- b. Barriers to entry – Regulatory, Huge set up cost
- c. Interdependence of airlines – airlines are affected by its rivals' decisions and likewise, its decisions affect its rivals – price wars
- d. Product differentiation – No frill flights, discount on advance bookings
-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

[5]

(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.



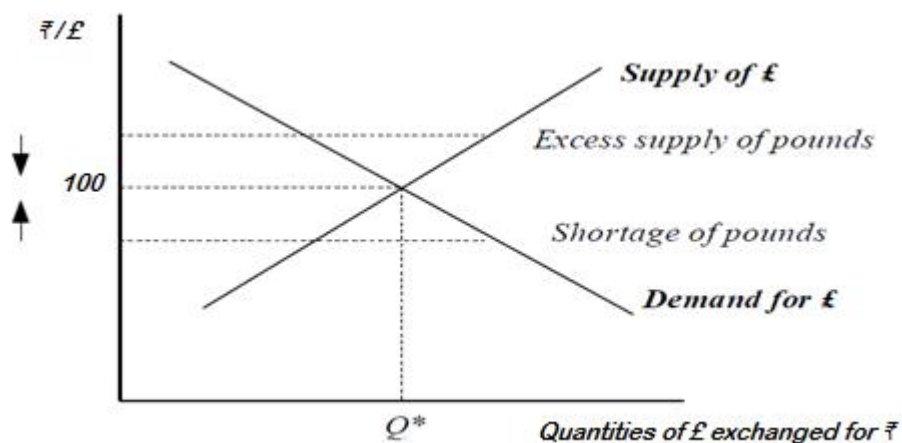
The leader sets its price at the output level (Q_{leader}) where it's $MR = MC$. The rest of the industry adopts the same price (P_{leader}).

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

[4]
[9 Marks]

Solution 36:

- i. Determination of the exchange rate (pound)



Explanation:

The Y axis indicates quantity of Rupees available for a Pound i.e. exchange rate of Pound.

The X axis indicates quantity of Pound.

The demand for Pound will be highest when the exchange rate of Pound is lowest and vice versa.

Similarly the supply of Pounds will be highest when exchange rate for Pound is highest. The intersection of these two lines determines the exchange rate.

In case of excess supply of pounds the quantity of pounds exchanged could be increased by reducing the exchange rate to increase demand.

Similarly, if the exchange rates are below ₹ 100, dealers would raise the exchange rate until supply could match demand.

[6]

ii.

1. increasing the interest rate
2. more exports than imports
3. intervention of the central bank – buying own currency
4. lower inflation in the domestic economy than abroad. So the domestic goods are more cheap
5. rise in the income of foreign nationals so that they will import more
6. relative investment prospects improving in the domestic market
7. Speculation resulting in expectation of rise in the value of domestic currency

Raising interest rates to increase deposits from overseas savers (increasing demand) and reduce deposits overseas by domestic savers (decreasing supply).

Borrowing in the form of a foreign currency loan in order to buy the domestic currency and so increase its demand.

Selling gold and foreign currency reserves to increase demand for the domestic currency.

[6]

[12 Marks]

Solution 37:

Structural unemployment: unemployment caused by a change in the structure of industry, either because of changes in the demand for a product, e.g. coal, or because of changes in the methods of production, e.g. internet banking.

There are two types of structural unemployment 1. Technological, and 2. Regional

Technological unemployment: structural unemployment resulting from the introduction of labour-saving technology.

Regional unemployment, i.e. structural unemployment that is concentrated in a particular region of the country.

[4 Marks]

Solution 38:

- i. The four major macroeconomic objectives are usually taken to be:
 - a high but sustainable rate of economic growth
 - a low level of unemployment

- a low and stable rate of inflation
- a favourable (and sustainable) balance of payments position. [2]

ii.

- increase the government expenditure on the investment
 - increase the output of the economy
 - increase the money supply for investment related activities
 - reduce the subsidy payments
 - tax benefits on investment
 - interest cut on investment
 - direct tax benefits on investment into infrastructure sector
 - increase in the domestic output with FDI [3]
- [5 Marks]**

Solution 39:

- i. There are three stages of technological change:
1. invention - the development of new ideas, processes and products
 2. innovation - the implementation of new ideas in practice
 3. diffusion - the spread of the new products and processes throughout the economy. [1.5]

ii.

- a. The patent system- A patent is a temporary legal monopoly awarded to an inventor who registers an invention.
- b. Public provision - The government could perform its own R&D through research institutions it controls, or by funding universities.
- c. R&D subsidies - The government could pay subsidies to firms conducting R&D. This would reduce a firm's disincentive to conduct R&D in the form of both cost and risk.
- d. Co-operative R&D - The government could encourage a number of firms to work together on a particular piece of R&D. This reduces the danger of duplication. Pooling of scarce resources may also allow the R&D team to reach a critical size required to make the project achievable.
- e. Diffusion policies - Diffusion policies are concerned with
 - the provision of information on new technologies
 - the encouragement of the use of new technologies. [5]

[6.5 Marks]
