

**INSTITUTE OF ACTUARIES OF INDIA**

**CT7 - Economics**

**May 2010 EXAMINATION**

**INDICATIVE SOLUTION**

- |       |       |
|-------|-------|
| 1) B  | [1.5] |
| 2) A  | [1.5] |
| 3) A  | [1.5] |
| 4) D  | [1.5] |
| 5) D  | [1.5] |
| 6) D  | [1.5] |
| 7) C  | [1.5] |
| 8) D  | [1.5] |
| 9) B  | [1.5] |
| 10) A | [1.5] |
| 11) D | [1.5] |
| 12) C | [1.5] |
| 13) C | [1.5] |
| 14) D | [1.5] |
| 15) B | [1.5] |
| 16) C | [1.5] |
| 17) A | [1.5] |
| 18) D | [1.5] |
| 19) C | [1.5] |
| 20) B | [1.5] |
| 21) D | [1.5] |
| 22) B | [1.5] |
| 23) C | [1.5] |
| 24) C | [1.5] |
| 25) C | [1.5] |
| 26) D | [1.5] |
| 27) B | [1.5] |
| 28) C | [1.5] |
| 29) B | [1.5] |
| 30) B | [1.5] |

**31.**

GDP\_MP (GDP at Market Prices) = Consumption+ Government Spending (excluding Transfer payments) + Investment + Exports – Imports

$$\text{GDP\_MP} = 345 + 215 + 330 + 95 - 115 = 870$$

Net Indirect Taxes = GDP\_MP – GDP\_FC (GDP at Market Prices minus GDP at factor Cost) or  
 NDP\_MP – NDP\_FC (Net Domestic Product at Market Prices minus Net Domestic Product at Factor Cost)

Thus, Net Indirect Taxes can be calculated only through ‘NDP\_MP – NDP\_FC’

$$\text{NDP\_MP} = \text{GDP\_MP} - \text{Depreciation} = 870 - 50 = 820$$

And,

$$\text{NDP\_FC} = \text{Wages} + \text{Rent} + \text{Interest} + \text{Profit} = 235 + 110 + 140 + 135 = 620$$

Now,

$$\text{Net Indirect Taxes} = \text{NDP\_MP} - \text{NDP\_FC} = 820 - 620 = 200$$

[8]

### Alternative solution:

$$\begin{aligned} \text{Net Indirect Taxes} &= \text{GNP\_MP} - \text{GNP\_FC} \text{ or} \\ &\text{GDP\_MP} - \text{GDP\_FC} \text{ or} \\ &\text{NNP\_MP} - \text{NNP\_FC} \text{ or} \\ &\text{NDP\_MP} - \text{NDP\_FC} \end{aligned}$$

Given the information in the question, Net Indirect Taxes can be calculated only through the last equation given above, i.e.,  $\text{Net Indirect Taxes} = \text{NDP\_MP} - \text{NDP\_FC}$

$$\text{Since } \text{NDP\_MP} = \text{GDP\_MP} - \text{Depreciation}$$

$$\text{Net Indirect Taxes} = \text{GDP\_MP} - \text{Depreciation} - \text{NDP\_FC}$$

$$\text{Depreciation} = 50 \text{ (given in the question)}$$

$\text{GDP\_MP}$  (GDP at Market Prices) = Consumption+ Government Spending (excluding Transfer payments) + Investment + Exports – Imports

$$\text{GDP\_MP} = 345 + 215 + 330 + 95 - 115 = 870$$

$$\text{NDP\_FC} = \text{Wages} + \text{Rent} + \text{Interest} + \text{Profit} = 235 + 110 + 140 + 135 = 620$$

$$\text{Net Indirect Taxes} = 870 - 50 - 620 = 200$$

[8]

### 32. a)

$$Y = C + c(Y - T - tY + R) + I + G + X - M - mY$$

$$Y = C + cY + cT - ctY + cR + I + G + X - M - mY$$

$$Y - cY + ctY + mY = C - cT + cR + I + G + X - M$$

$$Y(1 - c + ct + m) = C - cT + cR + I + G + X - M$$

$$Y = \frac{C - cT + cR + I + G + X - M}{(1 - c + ct + m)}$$

$$Y = \frac{100 - (0.75 \times 20) + (0.75 \times 40) + 45 + 80 + 40 - 30}{1 - 0.75 + (0.75 \times 0.20) + 0.10}$$

$$Y = \frac{100 - 15 + 30 + 45 + 80 + 40 - 30}{1 - 0.75 + 0.15 + 0.10}$$

$$Y = \frac{250}{0.5} = 500$$

b)

$$\text{Govt. purchase Multiplier} = \frac{\Delta Y}{\Delta G} = \frac{1}{1 - c + ct + m} = \frac{1}{0.50} = 2$$

c)

It government aims to increase the equilibrium level of income by 20 percent, the desired equilibrium level of income will be 600.

$$\text{Desired increase in Govt. purchases} = \frac{\Delta Y}{\text{Govt. Purchase Multiplier}} = \frac{100}{2} = 50$$

[11]

**33.**

a)

Japan has absolute cost advantage in production of pens because it can produce 10 more pens (60 minus 50 = 10) for one day of labour than India.

b)

Japan is 3 times (6/2=3) better than India in audio tape recorder production and 1.2 times (60/50=1.2) better in pen production. Alternatively, India is only 0.33 (2/6=0.33) as good as Japan in audio tape recorder production but 0.83 (50/60=0.83) as good in pen production. Thus, comparatively, Japan is better in audio tape recorder production and India is better in pens production.

c)

Yes, India should accept the offer. India would export 17.5 pens to Japan and get one audio tape recorder. This offer is beneficial to India as the price of one audio tape recorder is 25 pens in India. India needs to spend only 17.5 pens to buy one tape reorder rather than 25 pens. Thus, India saves 7.5 pens (25 – 17.5 = 7.5) in buying one tape recorder. India can buy 0.43 (7.5/17.5=0.43) more audio tape recorder with the benefit of 7.5 pens.

[6]

**34.**

Natural level of unemployment is that which occurs even when the labour market is in equilibrium.

Such unemployment is results from:

- Imperfect information about the labour market, so that employers and employees take time to search for the right employee and the right job;
- A change in the structure of industry, either because of changes in the demand for a product, or because of changes in the methods of production;

- Introduction of labour-saving technology;
- Concentration of structural unemployment in a particular region of the country;
- Decrease in the demand for labour at particular times of the year.

Natural unemployment could be addressed through supply-side policies such as improved information about job opportunities along with training and relocation incentives to combat occupational and regional immobility.

[3]

**35.**

When all players have a dominant strategy (*ie* a best strategy no matter what strategy the other player follows) and play it, the outcome is a *dominant equilibrium*.

When no player can improve his or her payoff, given the other player's strategy, a *Nash equilibrium* exists.

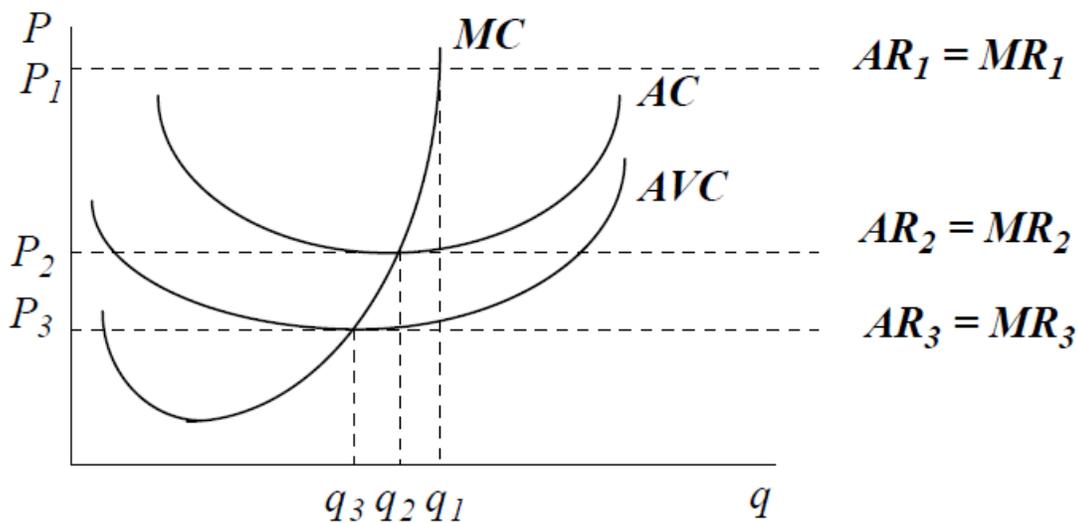
A dominant equilibrium is a special case of a Nash equilibrium ...

... but it is possible to have a Nash equilibrium that is not a dominant equilibrium..

[3]

**36.**

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  $P_1$ , then the firm will produce where  $MR = MC$ , *ie* at  $q_1$  – 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  $q_2$  – 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  $q_3$  – 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.

Since all firms must charge the same price, the short-run supply curve for the perfectly competitive industry is the horizontal summation of the short-run supply curves of the individual firms.

[5]

37.

a) Following 3-models can be used for describing the revival behavior on non-collusive oligopoly:

1. Cournot Model
2. Bertrand Model
3. Kinked Demand Theory

b) The kinked demand theory assumes that:

- if an oligopolist raises its price, its rivals will not follow suit – this leads to a relatively elastic demand curve at prices higher than the current price
- if an oligopolist cuts its price, its rivals will follow suit – this leads to a less elastic demand curve at prices lower than the current price.

[3]

38.

(i)

Output	Marginal Cost	Average Variable Cost
0	—	—
1	40	40
2	33	36.5
3	25	32.7
4	18	29
5	26	28.4
6	32	29
7	46	31.4

(ii) 5 or 6 (full marks will be awarded if answer is 6 and student has mentioned the MR=MC approach or 5 and 6 and student has mentioned the TR-TC approach)

(iii) Rs. 13

[4]

39.

(i) A high-price strategy by both firms would maximize joint profit.

(ii) Firm A: If Firm B adopts a high-price strategy, then Firm A should adopt a low-price strategy; if Firm B adopts a low-price strategy, then Firm A should adopt a low-price strategy. Thus, Firm A's dominant strategy is low-price.

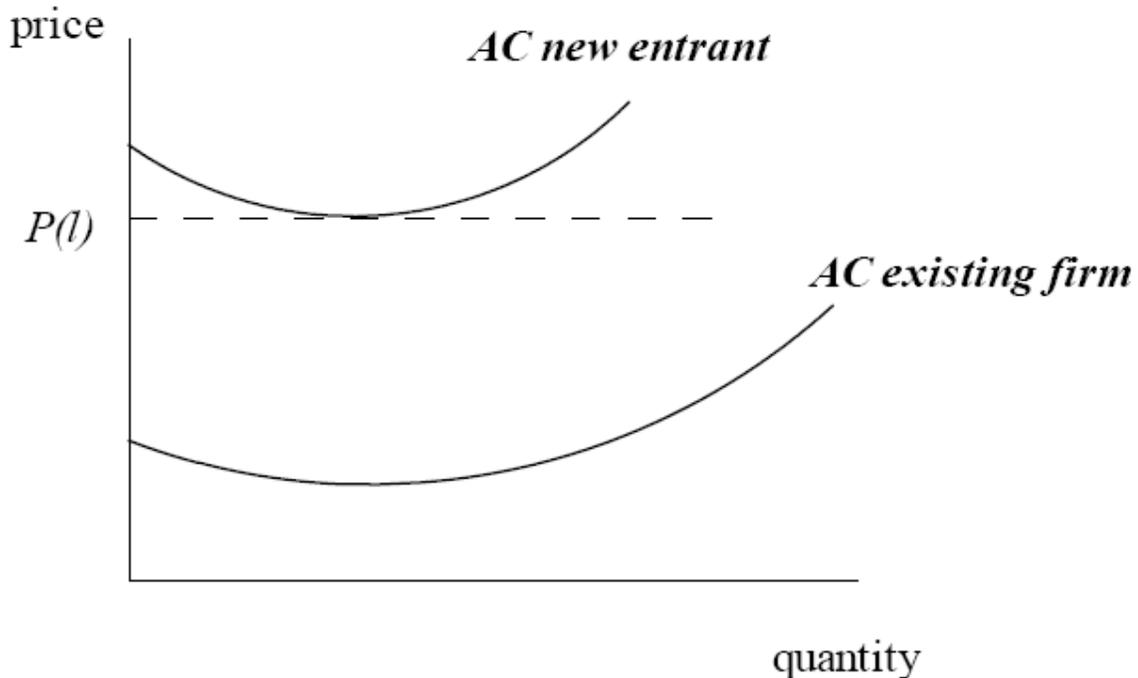
Similarly (and by symmetry), Firm B's dominant strategy is low price. Thus the dominant equilibrium is a low-price strategy by both firms.

(iii) If Firms A and B introduce a "meet-the-competition" clause into their contracts with customers, then there cannot be any difference in price and therefore the bottom-left cell and the top-right cell disappear. If one firm has a high price and the other a low price, then both have to charge a low price.

(iv) In this situation, both firms would charge a high price.

[5]

40.



Limit pricing is where an existing firm deliberately keeps its prices low so as to deter new entrants to the market.

Although the firm's profits may be reduced in the short run, this strategy may lead to greater long-run profits if new entrants are successfully deterred and competition thereby reduced.

This approach relies on the existing firm having lower average costs than potential new entrants.

[3]

40.

a) A merger occurs when two firms agree to combine their business operations. A takeover (or acquisition) occurs when one firm buys sufficient shares in another firm to take control of that firm.

b) Differences between mergers and takeovers:

1. A merger is agreed between the two firms, whereas a takeover can be either friendly, if both parties agree to it, or hostile.
2. A merger doesn't require finance, whereas a takeover requires finance to pay for the shares purchased in the target firm.
3. A merger usually leads to the retention of some managers from both firms, whereas a takeover may lead to the dismissal of all of the management of the firm acquired.

c)

Three types of mergers and takeovers

1. A horizontal merger (or takeover) involves two firms at the same stage of the same production process.
2. A vertical merger involves two firms at different stages of the same production process.
3. A conglomerate merger involves two firms in entirely unrelated industries.

[4]

[Total Marks 100]

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