

# **INSTITUTE OF ACTUARIES OF INDIA**

**May 2024**

**Subject CB2 – Business Economics**

**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.

<b><u>Solution 1:</u></b>	<b>B</b>	<b>[1.5]</b>
<b><u>Solution 2:</u></b>	<b>A</b>	<b>[1.5]</b>
<b><u>Solution 3:</u></b>	<b>A</b>	<b>[1.5]</b>
<b><u>Solution 4:</u></b>	<b>D</b> $= (48000/40000 - 1) / (3600/4000 - 1)$ $= -2.0$	<b>[1.5]</b>
<b><u>Solution 5:</u></b>	<b>C</b>	<b>[1.5]</b>
<b><u>Solution 6:</u></b>	<b>C</b>	<b>[1.5]</b>
<b><u>Solution 7:</u></b>	<b>B</b>	<b>[1.5]</b>
<b><u>Solution 8:</u></b>	<b>B</b>	<b>[1.5]</b>
<b><u>Solution 9:</u></b>	<b>C</b>	<b>[1.5]</b>
<b><u>Solution 10:</u></b>	<b>D</b>	<b>[1.5]</b>
<b><u>Solution 11:</u></b>	<b>C</b>	<b>[1.5]</b>
<b><u>Solution 12:</u></b>	<b>D</b>	<b>[1.5]</b>
<b><u>Solution 13:</u></b>	<b>B</b>	<b>[1.5]</b>
<b><u>Solution 14:</u></b>	<b>D</b>	<b>[1.5]</b>
<b><u>Solution 15:</u></b>	<b>D</b>	<b>[1.5]</b>
<b><u>Solution 16:</u></b>	<b>D</b>	<b>[1.5]</b>
<b><u>Solution 17:</u></b>	<b>D</b>	<b>[1.5]</b>
<b><u>Solution 18:</u></b>	<b>C</b>	<b>[1.5]</b>
<b><u>Solution 19:</u></b>	<b>B</b>	<b>[1.5]</b>
<b><u>Solution 20:</u></b>	<b>B</b>	<b>[1.5]</b>
<b><u>Solution 21:</u></b>	<b>C</b>	<b>[1.5]</b>
<b><u>Solution 22:</u></b>	<b>B</b> Money multiplier = $1000/400 = 2.5$ Money multiplier = bank deposits multiplier = $1/\text{Liquidity ratio}$ Liquidity ratio = $1 / 2.5$ which is 0.4	<b>[1.5]</b>
<b><u>Solution 23:</u></b>	<b>A</b>	<b>[1.5]</b>
<b><u>Solution 24:</u></b>	<b>D</b>	<b>[1.5]</b>
<b><u>Solution 25:</u></b>	<b>C</b>	<b>[1.5]</b>
<b><u>Solution 26:</u></b>	<b>D</b>	<b>[1.5]</b>
<b><u>Solution 27:</u></b>	<b>C</b> Total Revenue less Total cost wherever is the highest	<b>[1.5]</b>
<b><u>Solution 28:</u></b>	<b>B</b>	<b>[1.5]</b>
<b><u>Solution 29:</u></b>	Define the following terms:	
	<b>i) Adverse selection</b> A market process whereby buyers, sellers, or products with certain unobservable Characteristics (e.g. high risk or low quality) are more likely to enter the market at the current market price. This process can have a negative impact on economic efficiency and cause some potentially profitable markets to collapse.	<b>(1)</b>
	<b>ii) Law of diminishing marginal utility</b> The law of diminishing marginal utility states that the increase in the total utility derived from consumption of a good decreases with each additional unit consumed. In other words, utility increase, but at a decreasing rate.	<b>(1)</b>
	<b>iii) Endowment effect</b>	

The hypothesis that people ascribe more value to things when they own them than when they are merely considering purchasing or acquiring them. In other words, when the reference point is one of ownership rather than non-ownership. (1)

**iv) Indifference curve**

It is a line showing all those combinations of two goods between which a consumer is indifferent. These are the combinations that give the same level of utility. (1)

[4]

**Solution 30:** Economies of scale arise when long run average costs decrease as output rises (0.5)  
Plant economies of scale are economies of scale that arise specifically because of the large size of the production facility. (0.5)

Sources of plant economies:

**Specialization-** (0.5)

Different set of employees and pick up different tasks. For example one set of employees can pick up the task of washing the raw material, other can pick up the task of packing the finished material whereas another set could pick up the task of transporting it from the factory. (0.5)

**Indivisibilities-** (0.5)

The cost of machine for processing the input shall be purchased at a fixed cost no matter what the output is. As output increases the cost of machine per unit output decreases. (0.5)

**The container principle-** (0.5)

As production of processed food increases rapidly then the warehouse is more optimally utilised hence decreasing the per unit cost. (0.5)

**The greater efficiency of large machines-** (0.5)

Large machines have a higher cost but fewer people are required to operate it. Thus reducing the cost. (0.5)

**By-products-** (0.5)

Large scale production may generate sufficient quantities of waste and by-products which can be sold commercially. In this case the waste could be used to generate animal feed. (0.5)

**Multi stage production-** (0.5)

A large factory can handle washing, processing and packing thereby reducing wastage and transportation costs. (0.5)

[Max 6]

**Solution 31:** Outline the assumptions for a perfectly competitive market.  
There are four assumptions for a perfectly competitive market.

**1. All firms produce an identical market** (0.5)

The product is homogeneous. Therefore, there is no branding and no advertising, Since there would be no point in incurring that cost. (0.5)

**2. All firms are price takers** (0.5)

There are so many firms in the industry that each one produces a very small portion of industry supply and therefore has no power to affect the price of the product. It faces a horizontal demand curve at the market price. The price is determined by the interaction of demand and supply in the whole market. (0.5)

**3. There is complete freedom of entry** (0.5)

There is complete freedom of entry into the industry for new firms. Existing firms are unable to stop new firms setting up the business. (0.5)

**4. Producers and consumers have perfect knowledge of the market** (0.5)

Producers are fully aware of prices, costs, and market opportunities. Consumers are fully aware of the price, quality and availability of the product. (0.5)

[4]

**Solution 32:** In country X, Cancer drugs are patented and sold by a single pharma company. Name the type of market and explain the features of such a market.

Such a market structure is known as Monopoly. (0.5)

**Features of such a market are:**

There is a sole supplier of a product in an industry (0.5)

There will often be no potential rivals (0.5)

There are barriers to the entry of new firms in the industry (0.5)

The product is unique (0.5)

Monopolist faces the market demand curve (0.5)

In a monopoly, market demand curve is downward sloping (0.5)

Monopolist has considerable control over price (0.5)

Supernormal profits can be earned in the long run (0.5)

Production of output is less than the optimum level (0.5)

Monopoly may benefit from economies of scale (0.5)

There is room for investment in research and development in a monopoly (0.5)

A monopoly could operate a policy of price discrimination (0.5)

Monopolies can be subject to anti-trust regulation by the state (0.5)

[Max 5]

**Solution 33:** Define Full-Range pricing.

It is usual for a business to consider prices over its full range of products, rather than individually, in order to maximize its profits across all products. This is referred to as full range pricing. (1)

The reasons for using Full Range pricing with an example from the insurance sector.

A key part of the full range pricing is to offer loss leaders. In case of Insurance Company it may decide to sell the base policy at a loss. These are products which are sold at low prices, sometimes below cost. (1.5)

The aim is to attract customers into the business where it is hoped they will buy additional products the prices of which are higher relative to costs and so contribute more to the firm's profits. In case of Insurance Company these additional products could be riders on a base insurance policy. These riders are priced very profitably with a very high profit margin. (1.5)

This Company's total profitability relies on the assumption that rider attachment ratio (number of riders taken with the base policy) be higher than a particular amount. If that falls below a particular amount the company shall make a loss. (1)

The success of this strategy depends on the price elasticity of demand for the base product sold by the Insurance Company. The higher it is, the more customers will be attracted to it. (1)

[Max 5]

**Solution 34:**

i) The Pareto Optimum (or socially efficient) output level is the level of output at which it is impossible to make anyone better off without making someone else worse off. (1)

This occurs when the marginal social benefit (MSB) is equal to the marginal social cost (MSC). (0.5)

The MSB is equal to the marginal private benefit plus marginal external benefit. (0.5)

The demand curve – which we assume shows consumers' valuation of each extra unit of output – shows the marginal private benefit of each extra unit consumed.

Assuming diminishing marginal utility, the demand curve slopes downwards. So, assuming that the marginal external benefit is constant, (0.5)

the MSB curve slopes downwards. (0.5)

The MSC is equal to the marginal private cost plus the marginal external cost. (0.5)

Assuming the marginal external cost is constant, the MSC curve is J-shaped. (0.5)

As long as MSB exceeds MSC, social welfare can be increased by increasing output by an additional unit. (0.5)

The Pareto optimum output level occurs when the rising MSC curve cuts the falling MSB curve. (0.5)

(Max 4)

ii) Assuming there are no externalities, the Pareto optimal level of output is characterised by the condition that marginal private cost is equal to marginal private benefit (or price or average revenue). (0.5)

Since, for the monopolist,  $AR > MR$ , the profit-maximising level of output for the monopolist (where  $MC = MR$ ) occurs where  $P > MC$  and therefore is less than the Pareto optimum. (0.5)

However, the monopolist might produce at the socially optimum level of output if:

- it is required by government regulations to abandon profit maximisation and to produce at the level where price is equal to marginal cost (0.5)

- it engages in first degree price discrimination (where  $P = MR$ ) (0.5)

(2)

[6]

- Solution 35:** According to the new classicals, demand-side (monetary) policy is effective at controlling inflation, (0.5)
- However it should not be used to increase growth and reduce unemployment (0.5)
- New classical economists argue that supply-side policies should be used to achieve these objectives, (0.5)
- and they favour market-oriented supply-side policies. (0.5)
- According to Keynesian economists, demand-side policies should be used to increase aggregate demand in a recession, (0.5)
- so as to increase actual output and to reduce (demand-deficient) unemployment. (0.5)
- Keynesians agree that supply-side policy should be used to increase potential output (0.5)
- and to reduce equilibrium unemployment over the long term, however, modern Keynesians favour interventionist supply-side policies. (0.5)
- [Max 3]**

**Solution 36:**

- i)** The circular flow of income model depicts the flows of money round the economy. The inner flow shows the direct flows between firms and households. (1)
- Money flows from firms to households in the form of factor payments, and back again as consumer expenditure on domestically produced goods and services (1)
- (2)**
- ii)** Equilibrium in the circular flow of income occurs when planned withdrawals equal planned injections ,where (0.5)
- a. Withdrawals are the incomes of households or firms that are not passed on round the inner flow. Withdrawals equal net saving plus net taxes plus import expenditure. (1)
- b. Injections are the expenditure on the production of domestic firms coming from outside the inner flow of the circular flow of income. Injections equal investment plus government purchases plus expenditure on exports (1)
- Equilibrium in the circular flow of income occurs when planned withdrawals equal planned injections (0.5)
- (Max 2)**
- iii)** Define Gross Domestic Product and the three ways of measuring GDP.
- Gross domestic product (GDP) The value of output produced within the country over a 12-month period. (1)
- Three ways of measuring GDP
- 1. Product method** (0.5)

Add up the value of all the goods and services produced in the country, industry by industry. (0.5)

**2. Income method** (0.5)

The production of goods and services generates incomes for households in the form of wages and salaries, profits, rent and interest. The second method of measuring GDP, therefore, is to add up all these incomes. (0.5)

**3. Expenditure method** (0.5)

The third method focuses on the expenditures necessary to purchase the nation's or production. In this simple model of the circular flow of income, with no injections withdrawals, whatever is produced is sold. The value of what is sold must therefore be the value of what is produced. (0.5)

(4)

iv) The marginal propensity to consume domestically produced goods is 0.75 and the government decides to increase public spending by 100 million. According to Keynesian analysis, what is the total change in national income resulting from the increased government expenditure?

Injections multiplier is: (1)

$$k = 1/(1 - mpc_d)$$

$$= 1/(1 - 0.75)$$

$$= 4$$

therefore

$$dY = k * dJ = 4 * 100$$
 (1)

$$= 400 \text{ million}$$

So, total change in national income resulting from the increased government Expenditure is 400 million. (2)

[10]

**Solution 37:**

i) Secondary market is where holders of assets sell them to someone else before the maturity dates. (0.5)

The possibility of secondary marketing encourages people or institutions to buy assets/grant loans in the primary market, knowing that they can sell them if necessary in the secondary market. (0.5)

Two examples are:

**Certificate of deposits** (0.5)

CDs are issued for fixed-period deposits in a bank (e.g. one year) at an agreed interest rate (0.5)

The bank does not have to repay the deposit until the year is up (0.5)

CDs are thus illiquid liabilities for the bank, and they allow it to increase the proportion of illiquid assets without having a dangerously high maturity gap. (0.5)

But the holder of the CD in the meantime can sell it to someone else (through a broker). (0.5)

It is thus liquid to the holder (0.5)

Because CDs are liquid to the holder, they can be issued at a relatively low rate of Interest and thus allow the bank to increase its profitability. (0.5)

**Securitization** (0.5)

Securitisatio occurs when a financial institution, in this case the bank, pools Some of its assets such as residential mortgages, (0.5)

and sells them to an intermediary known as a special purpose vehicle (SPV) (0.5)

SPVs are legal entities created by the financial institution. (0.5)

In turn, the SPV funds its purchase of the assets by issuing bonds to investors (noteholders). (0.5)

These bonds are known as collateralised debt obligations (CDOs). (0.5)

Through this process, the bank removes the assets from its own balance sheet and frees up capital for further advances. (0.5)

However, it continues to generate return on its former assets by receiving a fee from the SPV for the servicing. (0.5)

The effect of secondary marketing is to reduce the liquidity ratio that that banks feel they need to keep. (0.5)

It has the effect of increasing their maturity gap. (0.5)

**(Max 2)**

**ii)** To the extent that banks individually feel that they can operate with a lower liquidity ratio, this will lead to a lower national liquidity ratio. (0.5)

This may lead to an excessive expansion of credit (illiquid assets) in times of economic boom. (0.5)

Also, there is an increased danger of banking collapse.

If one bank fails, this will have a knock-on effect on those banks which have purchased its assets. (0.5)

In the specific case of securitisation, the strength of the chain is potentially weakened (0.5)

if individual financial institutions move into riskier market segments such as sub-prime residential mortgage markets. (0.5)

Should the income streams of the originator's assets dry up for instance, if individuals default on their loans then the impact is felt by the whole of the chain. (0.5)

In other words, institutions and investors are exposed to the risks of the originator's lending strategy. (0.5)

**(Max 2)**

**[4]**



**Solution 38:** The rationale for using monetary policy to control inflation stems from the quantity theory of money. (0.5)

The theory is based on the equation of exchange:  
 $MV = PY$

where M is the money supply, V is the velocity of circulation (the number of times the money supply changes hands in a period of time), P is the price level, and Y is the level of real income or output (i.e. real GDP) (1)

The quantity theory of money assumes that both V and Y are constant, so that the inflation rate is directly determined by the rate of growth of the money supply. The monetarist school economists therefore argues that governments should keep tight control of the money supply to control inflation. (1)

Also, by sending out a signal that a tough monetary stance is being adopted, expected inflation might fall, which will help to reduce actual inflation. (0.5)

The main criticism of this theory lies in the assumptions that it makes. In practice, a reduction in M might lead to a compensating increase in V, leading national income unchanged. It is also possible that a decrease in M might lead to a decrease in Y, i.e. lower output, rather than a decrease in P. (1)

Another criticism of the theory is that it doesn't say how the change in price occurs. (0.5)  
**[Max 4]**

**Solution 39:**

- i)
- Reducing government spending (0.5)
  - Reducing taxes to influence the labour market and investment (0.5)
  - Reducing the power of labour (0.5)
  - Reducing welfare (0.5)
  - Privatization (0.5)
  - Deregulation (0.5)
  - Introducing market relationships into the public sector (0.5)
  - Public private partnerships (0.5)
  - Encouraging free trade and free capital movements (0.5)
- (Max 3)**

ii) *Advantages*

The contractor will meet the costs of building the airport, so the government does not need to borrow money or raise taxes now. (0.5)

Competition between contractors should drive down the price charged by the winning contractor for construction of the airport as well as the rent paid by the government afterwards. (0.5)

The winning contractor may have greater expertise in maintaining the airport than the government's own employees. (0.5)

The risk of increases in the cost of building/maintaining the airport is transferred to the contractor. (0.5)

*Disadvantages*

The contractor will charge not only for the expected cost of the project but will also charge a loading for risk and profit. (0.5)

Cost control may be weak, resulting in a higher burden for the taxpayer in the long run. (0.5)

The government loses some control over the quality of the project and the contractor may have lower standards than the government (0.5)

The overall cost to the taxpayer might be higher than if the government built and maintained the airport. (0.5)

There could be favouritism towards a particular contractor hence leading to airport going over budget. (0.5)

There could be chances of corruption as the government officials may select a contractor which does not have the right expertise and may select someone who gives the highest kickbacks for the officials (0.5)

If there are quality issues then the government will lose face and may lead to political fallout. (0.5)

**(Max 4)**  
**[7]**

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