CERTIFIED PUBLIC ACCOUNTANT

FOUNDATION LEVEL 2 EXAMINATIONS

F2.2: ECONOMICS AND THE BUSINESS ENVIRONMENT

DATE: THURSDAY 27, APRIL 2023

MARKING GUIDE AND MODEL ANSWERS

Marking guide

	QUESTION ONE	*Marks*
	Musange Mining Company (MMC)	
a)	Derivative of y and x	0.5
	Formula of chain rule	0.5
	Substitution into the chain rule	1.0
	Supply function	1.0
	Maximum marks	**3.0**
b)	Each correct quantity demanded (0.5 Marks each, max 7.5)	7.5
	Each correct quantity supplied (0.5 Marks each, max 7.5)	7.5
	Label for price (x)	0.5
	Label for quantity	0.5
	Demand curve	0.5
	Supply curve	0.5
	Maximum marks	**17**
	Total marks	**20**

Model answers:

a) i) Given the following information:

$$Q_s = \frac{dy}{dx} \qquad y = \sqrt{(2x^2 + 3)^8} \qquad Q_d = 20\text{-}2x$$

We can determine the supply function by following the Chain rule which can be expressed as follows:

$$\frac{dy}{dx} = \frac{dy}{du} * \frac{du}{dx}$$

$y = ((2x^2 + 3)^8)^{1/2}$

$y = (2x^2 + 3)^4$

Let $u = 2x^2 + 3$ \qquad Let $y = u^4$

$\frac{du}{dx} = 4x$ \qquad\qquad $\frac{dy}{du} = 4u^3$

$Q_s = 4x * 4(2x^2+3)^3$ \qquad **$Q_s = 16x\ (2x^2+3)^3$ **Supply function**

 ii) A well labelled graphical illustration that shows the range of prices within which demand and supply functions intersect.

Given the supply and demand function for Pozzolana grade "B" as follows:

Qsb = x ($\sqrt[11]{2x+3}$)   Qdb =30-2x   By assuming a price (x value) of 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15 FRW, we can substitute in the above equations to get the value of quantity demanded and quantity supplied and use them to draw a graphical illustration.

Assume x=1 Q_{db} =30-2x Q_{db} =30-2(1)   **Q_{db} =28 *****

Qsb= x ($\sqrt[11]{2x+3}$)   Qsb= 1 ($\sqrt[11]{2(1)+3}$)   Qsb= 1 ($\sqrt[11]{5}$)   Qsb= $5^{1/11}$ **Qsb= 1.157558*****

By rounding to two decimals, Qsb=1.16

Price(x)	Quantity supplied	Quantity demanded	
1	1.16	28	
2	2.39	26	
3	3.66	24	
4	4.97	22	
5	6.31	20	
6	7.67	18	
7	9.06	16	
8	10.46	14	
9	11.87	12	
10	13.30	10	
11	14.74	8	
12	16.19	6	
13	17.66	4	
14	19.13	2	
15	20.61	0	

Demand and supply curve for Pozzolana Grade B
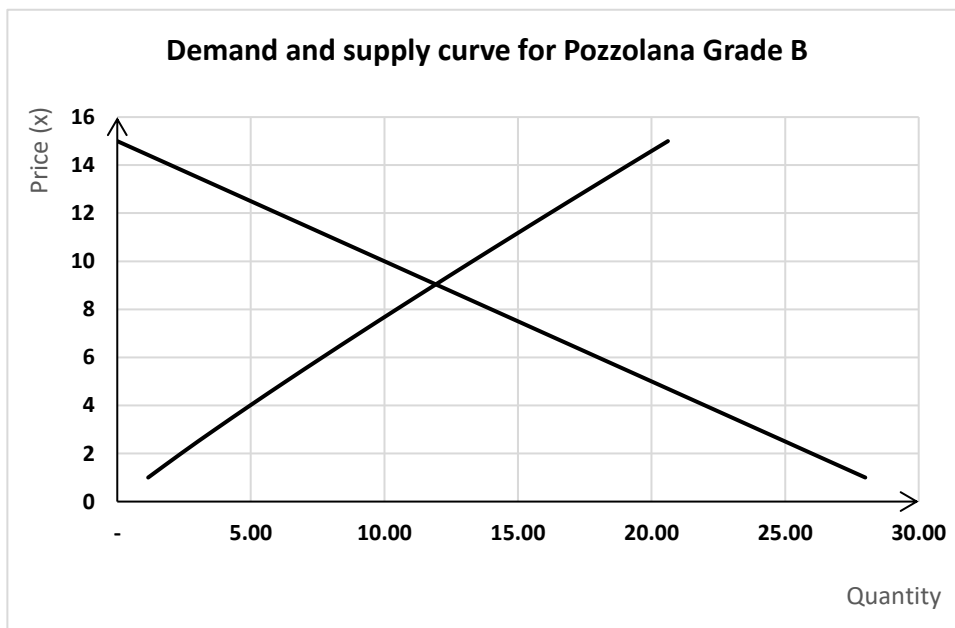
The equilibrium price, which is the price at which demand and supply curves intersect ranges between the price of FRW 8 and FRW 10.

   Marking guide

	QUESTION TWO	*Marks*
	PRIME BANK LTD	
a)	Explanation of credit creation process	2.0
	Formula of Reserve Asset Ratio (RAR)	0.5
	Calculation of Reserve Asset Ratio (RAR)	0.5
	Reserve Asset Ratio (RAR) answer	0.5
	Each clients credit created (0.5 Marks each, max 12.5)	
	Any wrong entry award zero	12.5
	Maximum marks	**16**
b)	Assumptions of quantity theory of money (1 Marks each, max 2)	2.0
	Limitations of quantity theory of money (1 Marks each, max 2)	2.0
	Maximum marks	**4.0**
	Total marks	**20**

Model answers

a) Credit creation is the process by which the money supply of a country or of an economic or monetary region is increased. In most modern economies, most of the money supply is in the form of bank deposits. Therefore, credit creation is also known as 'Deposit Creation'. It is a situation in which banks make more loans to customers and business, with the result that the amount of money in circulation (being passed from one person to another) increases.

Commercial banks are profit-seeking institutions. To make profits, banks must provide loans to creditworthy borrowers. Banks are financial intermediaries, receiving funds from some groups and advancing funds to other groups.

The fraction of deposit liabilities held in reserves by the bank is known as the Reserve Asset Ratio (RAR).

RAR= (Reserve Assets/Deposits liability)
Deposit Liabilities = Reserve Assets*(1/ RAR)
The credit multiplier = (1/RAR)
Or
RAR = (1/Multiplier)
RAR = 1/25
RAR = 4%
The bank's assets reserve ratio is 4%

By creating loans for 25 employees, the bank will achieve a deposit liability of FRW 16,350,478,795, a cash reserve of FRW 654,019,152 and total created loans of FRW 5,696,459,644.

A table showing the process of credit creation:

Rounds	Primary deposits/Bank liabilities (FRW)	Cash reserves (Bank asset) (4%)	Credit creation/Derivative deposits (Bank asset)
GWIZA	1,000,000,000	40,000,000	960,000,000
A	960,000,000	38,400,000	921,600,000
B	921,600,000	36,864,000	884,736,000
C	884,736,000	35,389,440	849,346,560
D	849,346,560	33,973,862	815,372,698
E	815,372,698	32,614,908	782,757,790
F	782,757,790	31,310,312	751,447,478
G	751,447,478	30,057,899	721,389,579
H	721,389,579	28,855,583	692,533,996
I	692,533,996	27,701,360	664,832,636
J	664,832,636	26,593,305	638,239,331
K	638,239,331	25,529,573	612,709,757
L	612,709,757	24,508,390	588,201,367
M	588,201,367	23,528,055	564,673,312
N	564,673,312	22,586,932	542,086,380
O	542,086,380	21,683,455	520,402,925
P	520,402,925	20,816,117	499,586,808
Q	499,586,808	19,983,472	479,603,335
R	479,603,335	19,184,133	460,419,202
S	460,419,202	18,416,768	442,002,434
T	442,002,434	17,680,097	424,322,337
U	424,322,337	16,972,893	407,349,443
V	407,349,443	16,293,978	391,055,465
W	391,055,465	15,642,219	375,413,247
X	375,413,247	15,016,530	360,396,717
Y	360,396,717	14,415,869	345,980,848
TOT	**16,350,478,795**	**654,019,152**	**15,696,459,644**

b) Assumptions of quantity theory of money

- The level of output of goods and services purchased,Y, clearly has an upper limit determined by available resources of land, labour and capital. If we start with the simplifying assumption that the economy is fully employed, then Y can be treated as fixed at its upper limit.
- The velocity of circulation, V, depends on how effectively the existing stock of money is being used. This depends on the pattern of payments in the economy and to some extent on the level of interest rates.
- Constant Money Supply Growth: It assumes that the money supply grows at a constant rate over time.

Limitations of the assumptions of quantity theory of money

- The assumption that Y is fixed at the full employment level may be inappropriate. If there is unemployment in the economy, then an expansionary monetary policy may lead to an increase in real output.
- There is much evidence to suggest that V is subject to significant variability. That being so, the simple link between M and P may be more complex than the simple QTM suggests.
- Logically, it is possible to reverse causation. The QTM assumes that changes in M cause changes in P. What if changes in P cause changes in M? Cost-Push explanations of inflation would tend to argue that the money supply adapts to accommodate changes in prices.
- Real vs. Nominal Variables: The quantity theory of money focuses on nominal variables (such as money supply and price level) and assumes that real variables (such as output and productivity) remain constant. However, in reality, changes in real variables can also affect the price level, making the relationship more complex than suggested by the theory.

Marking guide

QUESTION THREE *Marks*

INGAGI Firebox Ltd (IFL)

a)	Explanation of Goal incongruity	2.0
	Causes of goal incongruity (2 Marks each, max 4)	4.0
	Maximum marks	**6.0**
b)	Strageties to enhance goal congruence (1 Mark each, max 4)	**4.0**
c)	Categories of economies of scope (1 Mark each, max 4)	**4.0**
d)	Motives for mergers (1 Mark each, max 4)	**4.0**
e)	Explanation of horizontal growth	1.0
	Explanation of vertical growth	1.0
	Maximum marks	**2.0**
	Total marks	**20**

Model answers:

a) The term Goal incongruity was used to mean disagreements (incompatibility) of shareholders goals and senior managers goals. This situation leads to the principal-agent problems as there arises conflict of interest between owners of the company and the managers.

The goal incongruity may arise due to the following reasons:

▪ The failure to link compensation with performance. Shareholders may fail to recognize the managers' effort by allocating bonuses out of profits made by them.

▪ The absence of a corporate governance committee (board of directors) that oversees the actions of management in the interests of shareholders motivate senior managers to follow their goals.

▪ Shareholder's failure to monitor agent's performance. Owners of the company normally opt to hire expert consultants who look into the activities of agents.

▪ Unrestricted agents mandate. Shareholders should request agents to report their choices before making any decision. This limits agents' freedom to make decision at the expense of principals.

▪ Divergent Incentive Structures: Senior managers may be incentivized based on metrics such as short-term profits or market share growth, while shareholders may prioritize long-term sustainability and shareholder value. This difference in incentives can lead to conflicting goals.

▪ Information Asymmetry: Senior managers may have access to more information about the company's operations and performance than shareholders. This information

asymmetry can lead to a lack of transparency and trust, causing divergence in goals as shareholders may not fully understand or agree with management's decisions.

b) Goal congruence between shareholders and managers exist when their goals are in harmony. This exists in the absence of conflicts of interest between the principal and agent. Below are the four strategies to enhance goal congruence in IFL's operations:

- Agents monitoring by shareholders. This can be done through external audits, and independent appointed consultants who monitor the activities of agents.
- Convenient incentives to the managers which may include share options and annual bonuses when the target is achieved.
- Setting up IFL's corporate governance body (Board of Directors)
- Restricting sSenior managers freedom through clearly documented responsibilities.
- Transparent Communication: Implementing open and transparent communication channels between senior management and shareholders to ensure alignment of goals and objectives.
- Performance-Based Compensation: Aligning the compensation structure of senior managers with the long-term interests of shareholders, such as tying bonuses to long-term profitability and shareholder value.
- Stakeholder Engagement: Actively involving shareholders in the decision-making process and seeking their input on strategic initiatives to ensure their goals are considered.
- Regular Performance Evaluation: Conducting regular performance evaluations to assess the progress towards achieving both short-term and long-term goals, allowing for adjustments to be made as necessary to maintain alignment.

c) The decision of bringing IFL's sister companies to the central management of IFL targets the benefits of economies of scope. Economies of scope exist whenever it is less costly for two or more companies to be operated under centralised management than to function as separate independent companies. Shareholders may benefit in one of four categories;

- **Technology Fits** – IFL's sister companies may benefit from the sharing of common technology. This allows for more effective performance of technology-related activities

- **Benefiting Operating Fits** – opportunities may exist on this category to IFL's related companies due to the combination of activities or transfer skills / capabilities in procurement, conducting R & D, improving production processes etc.

- **Benefiting a distribution and Customer-Related Fits** – when the value chains of different businesses overlap to such an extent that the products are used by the same

customers, opportunities exist for cost savings in such areas as using a single sales force for all products instead of separate sales forces for each product line etc.

- **Benefiting Managerial Fits** – benefits in this category can be obtained when managerial knowledge in one line of business can be transferred to another line.

- **Operational Economies**: Sharing resources and expertise across different business units within IFL's centralized management structure, leading to cost savings and efficiency improvements.

- **Marketing Economies**: Leveraging IFL's brand reputation and marketing channels to promote products from sister companies, reducing marketing expenses and increasing market penetration.

- **Technological Economies**: Investing in shared technological infrastructure and research and development capabilities to drive innovation and product development across all sister companies.

- **Financial Economies**: Consolidating financial resources and leveraging economies of scale to access favorable financing options and reduce overall financial risks for all entities under centralized management.

d) Motives of mergers

These include some of the following;

- It allows the company to enter new product or / and market areas especially where the process of internal development is slow. This is especially true in many e- commerce businesses.
- The competitive situation may influence a company to adopt a merger strategy compared to being a new company entering the market. Competitive reaction is reduced if the former strategy is adopted.
- De-regulation is a driving force for many mergers which reduces the fragmentation of the market.
- Financial motives that enhance opportunities are also a factor.
- A lack of resources or competencies to compete successfully may be acquired that will offer better economies of scale or economies of scope.
- Economies of Scale: Merging with other companies can lead to cost savings and efficiency improvements through economies of scale, such as bulk purchasing discounts and shared infrastructure.
- Market Power: Mergers can increase market power and competitiveness by expanding market share, reducing competition, and increasing bargaining power with suppliers and customers.

- Diversification: Merging with complementary businesses can diversify IFL's product offerings, customer base, and revenue streams, reducing risk and increasing resilience to market fluctuations.

- Synergy: Merging with other companies can create synergies by combining complementary resources, capabilities, and expertise to achieve greater value than the sum of individual entities.

e) Difference between horizontal grwoth and vertical growth

Horizontal growth can be achieved through horizontal integration which is the development into activities which are competitive with, or complimentary to, a company's present activities. Many companies have realised that there are opportunities in other markets for the exploitation of its own competencies e.g. maybe to displace the current provider as a new entrant. Horizontal integration can occur at any stage within the value chain.

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Vertical growth can be achieved through vertical integration which is the extension of a firm's competitive ability within the same industry. It involves expanding the company's range of activities backwards into sources of supply and / or forwards towards end users of the final product.

Marking guide

QUESTION FOUR *Marks*

a) Explanation of monetary policy 2.0
   Monetary policy tools (2 Marks each, max 10) 10
   Maximum marks **12**
b) Balance of payment deficit policies (2 Marks each, max 8) 8.0
   Total marks **20**

Model answers:

a) Monetary policy refers to a set of tools to control the overall money supply and stabilizing the economy. Too much money in the economy can lead to inflation which undermines the value of the currency. The Central Bank may have a statutory obligation to protect the value of the currency irrespective of government policies.
   Controlling the amount of legal tender in the economy seems a simple task for any Central Bank given that they are the sole issuer. In practice, the control of the money supply is concerned with the creation of bank deposits by commercial banks.

Another defitinition: Monetary policy refers to the actions undertaken by a country's central bank (in this case, the National Bank of Rwanda and other East African Central Banks) to regulate the supply of money, credit, and interest rates in the economy to achieve specific macroeconomic objectives, primarily focusing on price stability, economic growth, and employment.

Monetary policy tools we may anticipate in EAC central banks include:
- ✓ **Open Market Operations:** The central bank is the holder of government securities. It can sell some securities to the public to decrease the money supply or centrally may buy securities to increase the money supply.

- ✓ **Discounted rate (Bank rate):** This is the rate at which the central bank (The lender of last resort) advances loans to commercial banks, this happens when commercial banks fall short of cash. The central bank may increase the discount rate in a bid to make loans very expensive so that commercial banks which borrow at this rate may also make loans very expensive, a situation that discourages the borrowers and the money supply in general.

- ✓ **Variable reserve requirement:** The central bank requires commercial banks to maintain a certain level of reserve, this is part of controlling commercial banks credits creation process. The central bank may increase this rate to discourage the money supply or decrease it to increase the supply.

- ✓ **Direct control and Moral suasion:** Moral suasion is a method of credit control where the central bank approaches commercial banks by using moral influences on commercial banks. It involves advices and suggestions to commercial banks to cooperate with the central banks. The success of this tool depends on the good cooperation between the two as there is no penalty involved for noncompliance.

- ✓ **Selective credit control:** This tool involves controlling the purposes of loans where the central bank encourages the lending of money to priority sectors like agriculture, mining, health or other essential sectors.

- ✓ **Supplementary reserves/Special deposit requirement**: If the central bank feels that there is too much money in circulation, it can require commercial banks to maintain additional reserves other than reserve asset ratio.

- ✓ **Forward Guidance**: Central banks use forward guidance to communicate their future monetary policy intentions to the public. This guidance can include indications about the future direction of interest rates, expected inflation targets, or other policy measures, influencing market expectations and behavior.

- ✓ **Quantitative Easing (QE):** In extraordinary circumstances such as economic downturns or financial crises, central banks may implement quantitative easing. QE involves the purchase of long-term government securities or other assets to increase the money supply, lower long-term interest rates, and stimulate lending and investment.

b) The balance of payments accounts represents a record of all transactions between residents and firms located in one country and the rest of the world. Depending on the nature of the transaction, the details will be recorded in either of the two accounts: the current account or the capital account. A deficit balance of payment implies that the country imports goods and services more than it exports. When a country experiences a balance of payments year after a year, and the sources of financing it are exhausted, a country is said to experience a balance of payment problems.

Policies to cure a balance of payment deficit:

i) Export promotion policy: This is a deliberate policy to increase export production through giving subsidies to producers, abolishing export duties to encourage exports. Currently, in most of the East African Community' countries, exports pay VAT at a rate of 0%.

ii) Import substitution: This is a policy to produce commodities formerly imported. It includes setting up import substitution industries and protecting them from competition through protectionism.

iii) Devaluation policy: This is the policy of making the country's currency cheaper in relation to the currency of other countries. This policy encourages exports by making them cheaper.

iv) Encouraging foreign investors: This can be done by adopting investment favoring laws and establishing companies where foreign investors can buy shares.

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v) Imports restrictions: This involves the fixing of imports quotas and increasing tariffs

vi) Promoting tourism and economic integration: Tourism brings the country a significant amount of revenues. Economic integration widens the market so that a country export easily commodities to all member states.

vii) Political stability: This encourages foreigners to buy from the country as well as visiting.

viii) Fiscal Policy: Adjusting government spending and taxation can impact the balance of payments. For example, reducing government expenditure or increasing taxes can reduce imports and improve the current account balance.

ix) Structural Reforms: Implementing structural reforms to improve productivity, enhance competitiveness, and diversify the economy can help address underlying issues causing the balance of payments deficit, such as over-reliance on imports or lack of export competitiveness.

x) Trade Policies: Implementing trade policies such as tariffs, quotas, or export subsidies can help correct trade imbalances by reducing imports or promoting exports.

Marking guide

QUESTION FIVE *Marks*

a) i) Limitations of multiplier (1 Mark each, max 4) 4.0
ii) Explanation of Keynesian theory of income & employment 2.0
iii) Differences of open & closed economy (2 Marks each, max 4) 4.0
Maximum marks **10**

b) i) Degrees of price discrimination (2 Marks each, max 6) 6.0
ii) Factors that would influence alternative use of factors of production
(2 Marks each, max 4) 4.0
Maximum marks **10**
Total marks **20**

Model answers:

a) i) Limitations of multiplier

Four Limitations of the Multiplier:

- If there is full employment, any increase in demand will be inflationary. (But can use the "de-multiplier" effect here).
- If the withdrawals (i.e. leakages) from the circular flow, savings, taxation or imports, are high the multiplier will be very small so "pump priming" will have little effect.
- There may be a long-term lapse before the benefits of the multiplier take effect. (So it is no good as a short-term solution to unemployment or inflation).
- The consumption function in modern times is volatile therefore the effects of the multiplier are also unpredictable.
- If the government tries to increase spending it can lead to other problems in the economy. The extra spending must be financed. If the government raises taxes, the multiplier will be lower and people may work less hard. If it borrows the money it can lead to high national debt problems and cause interest rates to rise.
- Time Lags: The multiplier effect may take time to materialize fully in the economy. There can be significant time lags between changes in expenditure and their impact on output and income, which can dampen the effectiveness of fiscal or monetary policy.
- Marginal Propensity to Consume (MPC) Assumption: The multiplier effect is based on the assumption of a constant marginal propensity to consume (MPC), which may not hold true in reality. Changes in consumer behavior, such as increased saving during times of economic uncertainty, can affect the size of the multiplier.

ii)   Explanation of the Keynesian theory of income and employment

The Keynesian theory of income and employment put forward a simple but persuasive explanation regarding the determination of output and employment in the economy. The level of output firms will be willing to produce, he argued, is determined by the aggregate demand (AD) for goods and services in the economy. The level of output firms are willing to produce will, in turn, determine the level of employment. The level of aggregate demand drives the economy.

If total demand in the economy were to rise, firms would wish to produce more and therefore they would be offering more employment. If total demand were to fall, firms would have accumulating unsold stocks leading them to cut production and employment. If we wish to know why the levels of output and employment tend to fluctuate, according to Keynes, the explanation is to be found in fluctuations in the level of aggregate demand.

According to this theory, aggregate demand is given by: **AD = C + I + G + (X – M)** Where; **(X-M):** Exports minus imports **AD:** Aggregate demand **G:** Government expenditure **C:** Consumption I: Investment.

iii)   Closed Economy vs. Open Economy

An economy can be classified into two main types: closed and open. These two types of economies differ significantly in terms of their interaction with other economies, their level of control over their economic policies, and their degree of exposure to external economic factors. In this essay, we will discuss the differences between a closed economy and an open economy, with a focus on their trade policies, control over resources, and their impact on economic growth and stability.

1. Trade Policies

A closed economy is characterized by minimal or no trade with other economies. This means that such an economy is largely self-sufficient, relying on its domestic production and consumption to meet its economic needs. On the other hand, an open economy actively engages in international trade, importing and exporting goods and services to other countries. This engagement allows for the exchange of resources, goods, and services, leading to a more diverse and dynamic economy.

2. Control Over Resources

In a closed economy, the government has more control over the allocation of resources, as it is not influenced by external factors or global market conditions. This allows for a more centralized decision-making process, which can be beneficial in terms of stability and maintaining a desired level of economic growth. However, this control may also lead to inefficiencies and misallocation of resources, as the government may not have access to the most up-to-date information on market trends and consumer preferences.

An open economy, on the other hand, is more susceptible to external factors, such as global market conditions and fluctuations in currency values. While this may lead to greater economic volatility, it also provides opportunities for economic growth and development, as open economies can take advantage of global market trends and opportunities.

3. Impact on Economic Growth and Stability

Closed economies tend to have slower economic growth rates, as they are not exposed to the dynamic forces of international trade and competition. This can lead to a more stable, but potentially less prosperous, economic environment. On the other hand, **open economies** experience faster economic growth rates, as they are able to take advantage of global opportunities and resources. However, this growth can also come with greater economic volatility, as open economies are more susceptible to external shocks and market fluctuations.

b) i) Degrees of price discrimination

Price discrimination refers to the practice of charging different prices for the same commodity. It is usually undertaken by a monopolist. When the price elasticities of demand in the markets where different prices are charged are different, it makes price discrimination effective.

The price elasticity of demand should be lower in the market where a monopolist charges a higher price, implying that consumers are less responsive to price changes in that market.

On the other hand, a discriminating monopolist charges a lower price in the market where price elasticity of demand is higher, since consumer demand is more responsive to price changes in that market.

The following are the three degrees (types) of price discrimination:

1. **First Degree Discrimination**

This is the most extreme form. Suppliers seek to charge each individual customer a price equal to his marginal utility, i.e. they will try to charge the highest price that each customer is prepared to pay. This is often called "haggling".

With first degree price discrimination, a firm sells each unit at the maximum amount any customer is willing to pay for it, so prices differ across customers. Some consumers pay more than others.

2. **Second Degree Discrimination**

This is the term sometimes applied where a selected number of large customers are charged prices lower than could be justified on the grounds of any large-scale economies achieved. If a customer buys in bulk, then some price reduction is normal because the unit costs of selling, administration and transport are all likely to be lower. It is not price discrimination when such cost savings are shared with the customer.

Price discrimination implies a price reduction to particular customers, made simply to obtain an order that would not otherwise be given, or to encourage loyalty from a customer whom the seller would not wish to lose.

3. Third Degree Discrimination

This is a situation where the firm is able to segment its customers into two or more separate markets, each market defined by unique demand characteristics. Some of these markets might be less price sensitive (price inelastic) relative to other markets where quantity demanded is more sensitive to price changes (price elastic).

ii) Factors that would influence alternative use of factors of production.

1. Changes in Factor Prices

If copper becomes more expensive, it might be possible to use aluminium as a substitute. If labour becomes more expensive because of pay rises or employment taxes, more extensive use may be made of capital in the form of labour-saving machinery. If land is very expensive, a firm may use a computer and highly-skilled staff to control stocks, so that less land is devoted to the storage of material. Capital and labour will thus replace land if their total additional cost is lower than that of the land saved.

2. Inventions

New discoveries change the production function. We are familiar with the developments which have helped to replace manual labour by capital in the form of earth-moving equipment, office machinery, computers, and electronically-controlled factory machines. In addition, modern developments in transport and communications, the building of new roads, and the extension of electric and gas power has given firms greater freedom in the choice of location, so that there is now a greater amount of land available for industrial use. The principle of substitution is not new but it is the key to the understanding of factor markets.

Marking guide

QUESTION SIX   *Marks*

a) Differences between cardinal utility and ordinary utility theories
   (1 Mark each, max 2)   **2.0**
b) Advantages of cardinal utility (1 Mark each, max 3)   3.0
   Disadvantages of cardinal utility (1 Mark each, max 3)   3.0
   Maximum marks   **6.0**
c) Computation of total utility (TU) (1.5 Marks each, max 3)   **3.0**
d) Functions of markets   (1 Mark each, max 2)   **2.0**
e) Relationship btn taxes and prices 1 Mark for each correct point **3.0**
f) Explanation of economic good   2.0
   Explanation of free good   2.0
   Maximum marks   **4.0**

Total marks   **20**

Model Answers:
   a) Difference between cardinal utility theory and ordinal utility theory:

Cardinal Utility Theory: Cardinal utility theory assumes that utility can be measured numerically and assigned specific units of measurement, such as utils. It suggests that consumers can express their preferences in absolute terms, allowing for precise comparison of utility between different goods or consumption levels.

Ordinal Utility Theory: Ordinal utility theory, on the other hand, does not assign numerical values to utility. Instead, it focuses on the ordinal ranking of preferences. It suggests that consumers can rank bundles of goods in terms of preference, indicating which bundle is preferred to others, but it does not quantify the intensity of preferences.

The cardinal utility theory also called the marshalling approach to utility states that utility is measured in units called utils and this concept of cardinal approach was used by Alfred marshall to define the consumers equilibrium while ordinal utility theory also called indifference curve analysis states that utility is not measured but consumers can only rank their preferences. Both theories are used to measure utility.

   b) Advantages and disadvantages of cardinal utility

Advantages of Cardinal utility approach:

   ▪ Quantification of Utility: Cardinal utility theory allows for the quantification of utility, enabling economists to measure and compare the satisfaction or welfare derived from different consumption choices.

- Precise Consumer Preferences: With cardinal utility, economists can precisely identify consumers' preferences and make accurate predictions about their behavior, leading to more effective decision-making in areas such as marketing and public policy.
- Mathematical Modeling: Cardinal utility lends itself well to mathematical modeling, facilitating rigorous analysis and theoretical developments in economics.
- It can study a combination of two goods.
- It helps in giving a better classification of goods into substitutes and its complements.
- It explains the law of demand for goods or service to satisfy the needs and wants of a consumer.
- It is able to explain the 'Law of Diminishing Marginal Utility'.

Disadvantages of the Cardinal Utility approach:

- There are unrealistic assumptions.
- There is difficulty in assigning a 'numerical value' to a concept of utility.
- The utility is comparable on a scale, but not 'easily quantifiable' or measured in numbers in order to determine its 'economic value'.
- There are many factors that can influence the decision of the consumers.

   c) **Computation of Total utility**

   $MU = (\Delta TU / \Delta Q)$

   ΔTU: Change in Total Utility
   MU: Marginal utility
   ΔQ: Change in quantity

Alternatively, $MU = (T_2 - T_1)/(Q_2 - Q_1)$ Where T_1 and T_2 stands for total utility 1 and 2 whereas Q_1 and Q_2 stands for units consumed respectively. By substituting the above data in our formula, we can easily get the missing figure of total utility.

$T_1 = 22$ $T_2 = ??$ $Q1 = 2$ $Q2 = 3$ $MU = 8$
$(22 - T_2)/(3-2) = 8$ $22 - T_2 = 8$ **T2 = 30**

$T_2 = 30$ $T_3 = ??$ $Q2 = 3$ $Q3 = 4$ $MU = 6$
$(30 - T_3)/(4-3) = 6$ $30 - T_3 = 6$ **T3 = 36**

$T_3 = 36$ $T_4 = ??$ $Q3 = 4$ $Q4 = 5$ $MU = 4$
$(36 - T_4)/(5-4) = 4$ $36 - T_4 = 4$ **T4 = 40**

$T_4 = 40$ $T_5 = ??$ $Q4 = 5$ $Q5 = 6$ $MU = 1$
$(40 - T_5)/(6-5) = 1$ $40 - T_5 = 1$ **T5 = 41**

$T_5 = 40$ $T_6 = ??$ $Q5 = 6$ $Q6 = 7$ $MU = -2$
$(41 - T_6)/(7-6) = -2$ $41 - T_6 = -2$ **T6 = 39**

$T_6=41$ $T_7=??$ $Q6=7$ $Q7=8$ $MU=-5$

$(39-T_7)/(8-7)=-5$ $39-T_7=-2$ **T7=34**

Table showing computation of total utility:

Units	0	1	2	3	4	5	6	7	8
Total Utility (TU)	0	12	22	**30**	**36**	**40**	**41**	**39**	**34**
Marginal utility (MU)	0	12	10	8	6	4	1	-2	-5

d) Functions of markets

1. Information

The market serves to convey information about the conditions of supply and demand. I may go to a furniture store, not just to buy a piece of furniture but to see what furniture is available and at what price. The better the communication system within the market, the more information about what can be bought - and the more chance of achieving full utility from the purchase.

This communication function works both ways. The market also informs actual and potential suppliers about the strength and pattern of demand - about what people want to acquire and what level of price they are prepared to pay. Suppliers need this information in order to plan production.

2. Establishing Price

The equilibrium price is the one at which the intentions of suppliers are just matched by the intentions of buyers, i.e. where the amount of the good demanded is just equal to the amount provided. In this state there is no pressure from either supply or demand to move away from this price, so the market forces are in a state of rest - in equilibrium.

3. Allocation of Resources

Markets serve as mechanisms for allocating scarce resources among competing uses. Through the interaction of supply and demand, markets determine the prices of goods and services, which in turn guide producers and consumers in their resource allocation decisions. Resources flow towards their most valued uses, resulting in an efficient allocation of resources that maximizes economic welfare.

e) Relationship between indirect taxes and prices

If the government increases indirect tax on goods which are price elastic, it will not receive much extra tax but it will depress demand. If it imposes the tax on goods which are price inelastic, it will not have much effect on output but the government will collect more tax revenue.

Suppose there is a general increase in indirect tax on all goods. Some will be demand price inelastic, and their pricing will increase without much reduction in the amount supplied and bought. The buyers are paying more for nearly the same quantity of goods. This means they have less income to spend on other goods - they will have to cut purchases of goods which are price elastic.

The unfortunate producers of price-elastic goods will suffer a double blow. They will suffer a drop in demand from the tax increase and not be able to increase price by anything like the full amount of the tax, and they will suffer a further drop in demand because consumers' discretionary incomes have fallen.

Taxes would be used either to increase government revenues or to reduce consumer demand if the government believed that excess demand was causing inflation. There is, however, another aspect of government policy that is not beginning to appear: this is the control of pollution, which is now recognised as a significant problem.

As indirect tax on expenditure could be used as in instrument to reduce demand, and hence

the production or use of something that was believed to be a source of pollution. An example would be an additional tax on petrol to discourage the use of motor vehicles. However, as the demand for petrol is price inelastic then the tax will not have much effect on vehicle use but will reduce consumer incomes available for spending on other goods. One of the main reasons why demand for petrol for car use is price inelastic is because of the lack of satisfactory substitutes. As motor vehicle ownership has increased, the demand for, and supply of, public transport has fallen; and as public transport provision falls and its price rises so even more people are induced to use their own private cars.

f) Concepts of economic goods and free goods

- **Economic Goods**: Economic goods are goods that are scarce relative to demand and have an opportunity cost associated with their consumption or production. These goods are limited in supply and are subject to competition, leading to their allocation through markets. Examples include food, clothing, cars, and houses.
- **Free Goods**: Free goods, on the other hand, are goods that are abundant in relation to demand and are not subject to scarcity or competition. They are available in such abundance that they can be consumed or utilized without any significant cost or effort. Examples include air, sunlight, and seawater (in certain contexts). Free goods do not command a price in the market and do not have an opportunity cost associated with their consumption or production.

Goods/services are economic if scarce resources have to be used to obtain or modify them so that they are of use, i.e. have utility, for people. They are free if they can be enjoyed or used without any sacrifice of resources. The air we breathe under normal conditions is free, but not when it has to be purified or kept at a constant and bearable pressure in an airliner. Rainwater, when it falls in the open on growing crops, is free but not when it has to be carried to the crops along irrigation channels or purified to make it safe for humans to drink. Free goods are indeed very precious and people are becoming increasingly aware of the costs of destroying them by their activities, e.g. by polluting the air in the areas where we live.

QUESTION SEVEN *Marks*

a) Conditions of perfect competition
   Stating the condition (1 Mark each, max 5)   5.0
   Explaining the condition (1 Mark each, max 5)   5.0
   Maximum marks   **10**

b) i) Explanation of oligopoly   1.0
   Explanation of monopolistic competition   1.0
   ii) Features of monopolistic competition (1 Mark each, max 2)   2.0
   Maximum marks   **4.0**

c) Explanation of the concept of production possibilities   **2.0**

d) Explanation of marginal product of labour   2.0
   Explanation of total product of labour   2.0
   Maximum marks   **4.0**
   Total marks   **20**

Model Answers:

  a) Conditions for perfect competition
    1. Goods Must Be Homogeneous
This means that, in the perception of the buyer, all units of the goods offered by all suppliers are equally acceptable. The buyer is indifferent as to which unit he receives, as long as it conforms to any description adopted by, and understood in, the market. Notice that it is the perception of the buyer that is important. Suppose two large retail stores make an arrangement with a manufacturer to be supplied with canned coffee in plain tins. The manufacturer supplies coffee of the same type and quality to each retailer in the plain cans quite impartially. However, each store adds its own label to the cans and sells the coffee under completely different brand names and at slightly different prices. The products are physically the same, but they are not homogeneous, because the public perceives them as different and competing products.

    2. Perfect Transport and Communications
All consumers in the market must have the same information. Suppliers must have access to the same information about production factors and the technical conditions of production. No producer is in a more favoured situation than any other.

    3. Price Established Only by Market Forces
No producer and no buyer is able to influence the price by his own actions, nor by actions agreed with other producers or buyers. There is no degree of monopoly power in the market.

    4. Economic Motives Only
The actions of suppliers and buyers are influenced only by economic motives. If buyers or sellers are influenced by a desire to support a charity or a political party the market will not be purely economic, however worthy the social motives.

Economic rationality in a market economy assumes an underlying self-interest and a desire to maximise benefits that can be gained from available scarce resources. For the consumer this means maximising utility while for producers it is usually interpreted as wishing to maximise profit.

5. No Barriers Limiting Market Entry and Exit

Suppliers and buyers must be free to enter and leave the market as they choose and as they are guided by considerations of profit and utility. This is a very important element in any competitive market and in some modern models of market behaviour, notably that of contestable markets, it is the most important consideration.

b) **i) Difference between oligopoly and monopolistic competition**

Oligopoly is the market structure where supply is controlled by a few firms which are large in relation to the market size. Very often the firms are also large by any standards, and are likely to be oligopolists in several markets.

Oligopoly is now commonly found in the advanced industrial countries and a great deal of attention is paid to it. There is, however, no single model which can be held to apply under all circumstances.

While

Monopolistic competition is the martket structure where sellers seek to increase this preference by differentiating their product through branding (giving it distinguishing features) and especially by advertising. The greater the degree of preference they can establish, the stronger the brand loyalty and the greater the freedom gained by the supplier from needing to follow the market price for that class of product. Success brings an increased degree of market power and a reduction in price elasticity of demand.

Or Monopolistic competition is defined as a market setting in which a large number of sellers sell differentiated products. The theory of monopolistic competition has elements of both monopoly and perfect competition.

ii) Characteristics of monopolistic competition

• Large number of buyers and sellers.
• Free entry and exit
• Perfect factor mobility
• Complete dissemination of market information.
• Differentiated product.

c) **Concept of production possibilities**

d) Production possibilities refer to the various combinations of goods and services that an economy can produce given its available resources and level of technology. It illustrates the trade-offs that an economy faces when allocating its scarce resources between different goods and services. Production possibilities are typically represented graphically using a production possibilities frontier (PPF) or curve, which shows the maximum output levels attainable for two goods given the economy's resources and technology.

If individual firms are likely to face a point of maximum production as they reach the limits of their available resources the same is likely to be true of communities, whose total potential product must also be limited by the resources available to the community and by the level of technology which enables those resources to be put to productive use.

This idea is frequently illustrated by economists through what is usually termed the production possibilities frontier (or curve). The frontier represents the limit of what can be produced by a community from its available resources and at its current level of production technology. The frontier can be illustrated through a simple two-dimensional graph we have to assume just two classes of goods and, for simplicity, we can call these consumer goods (goods and services for personal and household use) and capital goods (goods and services for use by production organisations for the production of further goods).

e) **Difference between marginal product of labour and total product of labour.**

Marginal Product of Labor (MPL): The marginal product of labor measures the change in output resulting from the addition of one more unit of labor, while keeping all other inputs constant. It represents the additional output produced by the last unit of labor employed.

Average Product of Labor (APL): The average product of labor measures the total output produced per unit of labor input. It is calculated by dividing total output by the number of units of labor employed. It represents the productivity of labor on average across all units of labor employed.

The marginal product of labour is the change in total product resulting from a change in the amount of labour employed. It is called marginal because it is the change at the edge, and the term 'marginal' is used in economics to denote a change in the total of one variable which results from a single unit change in another variable. Here the total is quantity of production resulting from changes in the number of workers employed. While

The average product of labour employed is found simply by dividing the total product at any given level of employment by the number of workers (or some unit of worker-hours). The average product of labour, though a measure easily understood and used by many business managers and their accountants, is less important than the marginal product.

END OF MARKING GUIDE AND MODEL ANSWER.