Paper-15: Business Strategy and Strategic Cost Management

The following table lists the learning objectives and the verbs that appear in the syllabus learning aims and examination questions:

	Learning objectives	Verbs used	Definition
LEVEL C	KNOWLEDGE What you are expected to know	List	Make a list of
		State	Express, fully or clearly, the details/facts
		Define	Give the exact meaning of
	COMPREHENSION What you are expected to understand	Describe	Communicate the key features of
		Distinguish	Highlight the differences between
		Explain	Make clear or intelligible/ state the meaning or purpose of
		Identity	Recognize, establish or select after consideration
		Illustrate	Use an example to describe or explain something
	APPLICATION How you are expected to apply your knowledge	Apply	Put to practical use
		Calculate	Ascertain or reckon mathematically
		Demonstrate	Prove with certainty or exhibit by practical means
		Prepare	Make or get ready for use
		Reconcile	Make or prove consistent/ compatible
		Solve	Find an answer to
		Tabulate	Arrange in a table
	ANALYSIS How you are expected to analyse the detail of what you have learned	Analyse	Examine in detail the structure of
		Categorise	Place into a defined class or division
		Compare and contrast	Show the similarities and/or differences between
		Construct	Build up or compile
		Prioritise	Place in order of priority or sequence for action
		Produce	Create or bring into existence
	SYNTHESIS How you are expected to utilize the information gathered to reach an optimum conclusion by a process of reasoning	Discuss	Examine in detail by argument
		Interpret	Translate into intelligible or familiar terms
		Decide	To solve or conclude
	EVALUATION How you are expected to use your learning to evaluate, make decisions or recommendations	Advise	Counsel, inform or notify
		Evaluate	Appraise or asses the value of
		Recommend	Propose a course of action

Paper-15: Business Strategy and Strategic Cost Management

Full Marks: 100 **Time Allowed: 3 Hours**

This paper contains 4 questions. All questions are compulsory, subject to instruction provided against each questions. All workings must form part of your answer. Assumptions, if any, must be clearly indicated.

Question 1: **[20 Marks]**

Read the case and answer the following questions

BB Ltd. is a business organized as three divisions and head office. The divisions are based on market groupings, which are retail, wholesale and Government. The divisions do not trade with each other.

The main method of control of the divisions has been the requirement to earn a return on investment (ROI) of 15% p.a. The definition of return and capital employed is provided by head office, at the criterion ROI rate of 15%.

The recent experience of BB Ltd., is that the group as a whole has been able to earn the 15% but there have been wide variations between the results obtained by different division. This infringes another group policy that forbids cross-subsidization, i.e. each and every division must earn the criterion ROI.

BB Ltd. Is now considering divestment strategies and this could include the closure of one or more of its divisions. The head office is aware that the Boston Product Market Portfolio Matrix (BPMPM) is widely used within the divisions in the formulation and review of marketing strategies. As it is so widely known within the group and is generally regarded by the divisions as being useful, the head office is considering employing this approach to assist in the divestment decision.

You are required to:

(i) Evaluate the use by BB Ltd. of the concept of ROI and its policy that forbids cross subsidization.

(ii) Describe the extent to which the BPMPM could be applied by BB Ltd. In its divestment decision. Evaluate the appropriateness of the use of the BPMPM for this purpose.

(iii) Recommend, and justify, two other models that could be used in making a divestment decision. Demonstrate how BB Ltd. could utilize these models to make this decision.

[6+6+8 = 20]

Answer:

(i) Evaluation of the use of the concept of ROI by BB Ltd.

ROI is an accounting measure that estimates the level of profits as a proportion of the capital employed over the year. The concept of ROI is widely used by different companies to measures its performance. Therefore BB Ltd. Is not unusual in using this concept of ROI as a means of performance monitoring of its different divisions.

Perhaps on division of BB Ltd., may have failed to meet its ROI because it might have recently purchased new fixed assets. Perhaps another division might be using old assets that have been written off. Further one division might be riskier than another division.

ROI and cross subsidization:

There could be a lot of problems with cross subsidy. This issue of cross subsidies is more complex than it first appears.

We do not know how the investment funds have been allocated if the head office allocates them, and the divisions cannot take their own investment decisions, there is a cross subsidization by the back door as it were. Further one division's hard earned cash might be used to buy another division's assets. Arguably, cross-subsidization is the advantage of a business like BB Ltd.

Further, if the businesses have different business cycle, they are able to bail each other out when appropriate, whilst ensuring that the shareholders receive a fairly constant return.

(ii) Application of BPMPM by BB Ltd. in its divestment decision:

BPMPM aims to link the overall growth of the market for a product, the growth in the market share of a product, with the product's cash-generative activities.

BPMPM classifies a company's products in terms of potential cash generation and cash expenditure requirements into cash cows, dogs, stars and question marks.

- **Stars** are products with a high share of a high growth market. In short term, term require capital expenditure, in excess of the cash they generate, in order to maintain their market position, but promise high returns in the future. In due course, however, stars will become cash cows, which are characterized by a high market share, but low sales growth.

- **Cash cows** need very little capital expenditure and generate high level of cash income. The important strategic feature of cash cows is that they are already generating high cash returns that can be used to finance the stars.

- **Question marks** are products in a high-growth market, but where they have a low market share. A decision needs to be taken about whether the products justify considerable capital expenditure in the hope of increasing their market share, or whether they should be allowed dying quietly.

- **Dogs** products with a low share of a low growth market. Dogs should be allowed to die, or should be killed off.

Appropriateness of use of BPMPM:

BPMP is conventionally assumed to apply to products and it is perhaps unusual to see it applied to businesses and divisions.

The problem is that we do not know enough about the firm's product range to suggest how the matrix could be applied.

Rather than assuming that a whole division is a dog and divesting it, is possible that a thorough review of the product range of each division could be examined to see whether certain products can be pruned from the range.

BPMPM should not be used in isolation. Further it needs to be modified from time to time.

(iii) Models for making a divestment decision:

A no. of models is available, which could be used by the co. in making a divestment decision.

Two such models could be:
- Porter's five forces model and
- The product life cycle.

Porter's five forces model:

This model can be used to place each division in the competitive context. The five forces model suggests that the competitive environment is determined by five factors viz.

- The threat of new entrants.
- The threat of substitute products,
- The bargaining power of customers,
- The bargaining power of suppliers and
- The state of competitive rivalry within the industry.

The value of this model is that it examines each division's strengths in a competitive context. If the trend is for entry barriers to get lower, or if a major new entrant is no the horizon, this must influence the divestment decision, if the business is a marginal player in the market or if the resources required to fight off such a challenge are too expensive.

Similarly, if the customers are powerful or suppliers are powerful, then the margins would get eroded steadily and firm's business would become less attractive. Similarly if the threat of substitute products becomes serious, then divestment might become a sensible choice.

The product Life cycle:

This model bears similarities to the BCG matrix. This model suggests that a firm's products have a natural life cycle that can be analyzed into the phases of **introduction, growth, maturity** and **decline**.

In the **introduction phase**, the product still has to make money.

In the **growth phase**, it starts to make profit.

Maturity occurs when the demand is no longer growing. The demand and the profit are at its peak.

In the **decline phase**, demand falls off, profits fall and eventually no profits are made. Thus BB Ltd. Can use this model to examine the condition of the products in each of the divisions.

Question 2: Answer any two questions **[30 Marks]**

Question 2(a):

(i) "Strategic planning may be done in levels." Comment.
(ii) Distinguish between "Strategies" and "Tactics".
(iii) Write a short note on "Value Creation"

[6+6+3 = 15]

Answer:

(i) Many organisations develop strategies at three different levels: corporate, business and functional.

1. **Corporate-level Strategic Planning:**

It is the process of defining the overall character and purpose of the organisation, the business it will enter and leave and how resources will be distributed among those businesses. Strategy at this level is typically developed by top management (The Board of Directors, CEO etc.) The decisions are broad-based, carry greater risk and affect most parts of the organisation (e.g. The type of business that the organisation should enter, changes required in growth strategy, acquisition and diversification decisions etc.).

2. **Business-level Strategic Planning:**
   It is the planning process concerned primarily with how to manage the interests and operations of a particular unit within the organisation, commonly known as a strategic business unit (SBU). A strategic business unit is a distinct business with its own set of competitors that can be managed reasonably independently of other businesses within the organisation. Generally, the heads of the respective business units develop business strategies, with the approval of top management. Strategies at this level are aimed at deciding the competitive advantage to build, determining responses to changing market situations, allocating resources within the business unit and coordinating functional-level strategies developed by functional managers.

3. **Functional-level Strategic Planning:**
   It is the process of determining policies and procedures for (relatively narrow levels of activity) different functions of an enterprise like marketing, finance, personnel etc. These are developed by functional managers and are typically reviewed by business unit heads.

Coordinating strategies across the three levels is crucial in maximising strategic impact. The strength of the business-level strategy is enhanced when functional level strategies support its basic thrust. Similarly, the corporate-level is likely to have greater impact when business-level strategies support one another in bolstering the corporate-level strategy

(ii) It is useful to draw the distinction between strategies and tactics. Strategy is a comprehensive plan designed to ensure that the basic objectives of an enterprise are achieved. It includes determination of a specific course of action that is capable of meeting competition as well as fulfilling an enterprise's objectives. It is action-based and more specific than objectives.

To achieve clarity, managers now-a-days talk about four types of strategies:

1. Master or grand strategies that cover the entire pattern of an organisation's objectives, policies and specific resources deployment. Grand strategies are derived from a careful situational analysis of the organisation and its environment.
2. Programme strategies are more specific and are concerned with the deployment of resources to achieve basic organisational objectives.
3. Sub-strategies are more detailed than programme strategies and focus on the attainment of specific objectives.

4. Tactics are the action plans of specific, step-by-step methods by which strategies are executed. Tactics convert the philosophy of management into practice and force the enterprise to go down to the nuts and bolts of its operations. Tactics are formulated at the supervisory level and their primary focus is on implementing policy decisions taken at the top level. They are short-term in nature and mainly concentrate on people and their actions.

The differences between strategies and tactics are outlined below:

Strategies	Tactics
Developed by management; these decisions are never delegated below a certain level in management hierarchy. Generally the focus is on long-term.	Employed and related to lower levels of management.
Generally the focus is on long-term.	The focus is on short-term.
The uncertainty level is quite high; lots of information to be obtained from diverse sources.	Decisions are more certain and are taken within the framework of strategies.
Affect various parts of an organisation in a significant way.	The reach is limited to only specific segments of an organisation.

These differences should not always be taken seriously as tactics are nothing but sub-strategies developed at a lower level.

(iii) Value Creation:

A firm, in the final analysis, has to define the factors that offer 'value' to customers in terms of say low price, high quality, fast delivery, novel features, excellent after sales service etc. Simply stated, value is the ratio between what the customer gets (both functional and emotional benefits) and what he gives (in terms of money paid, energy expended, time spent and the opportunity scarified). To survive and flourish in a competitive market, a firm should always define its business in terms of how it is going to offer certain benefits to customers more effectively than its rivals.

The vision, mission and business definition help a firm define its basic philosophy to be adopted in the long run. Objectives and goals try to translate this rhetoric into concrete action plans in the short tern. The next section throws light on this aspect. In view of the growing importance of corporate social actions in ensuring a better standard of living to various sections of society in recent times — a separate section is also added at the end throwing light on the theoretical controversies, practical difficulties and current practices in this field

Question 2(b):

(i) State what you understand by "Stability Strategies". Do you think there are specific situations and reasons to undertake them.

(ii) Discuss in brief about 'Market challengers'.

[(3+7) + 5 = 15]

Answer:

(i) Stability Strategies:

Stability strategy, or stable growth strategy, though most frequently used by most of the organizations, often presents a confusing nomenclature. In fact, most of such organizations look for growth and do not remain stable over the long period of time. However, when they adopt some changes in their strategy postures, they try to stabilise in a particular area which is consistent with their strengths. Thus, basic approach in the stability strategy is 'maintain present course: steady as it goes'.

When and Why to Pursue Stability Strategy?

Stability is common for most of the organizations at some point of time. However, it is better that the organizations concerned should evaluate when they should go for change in their strategy. In the following conditions, it is better to adopt stability strategy:

1. When the organization is serving a defined market or its segments according to its business definitions, it can adopt stability strategy. This happens with most of the organizations in the short term because their environment does not change and they can continue in the same business.
2. If the organization continues to pursue same objectives, it is better to adopt stability strategy adjusting the level of achievement about the same percentage each year as it has achieved in the past without substantial additional investment. For example, renovation of plant and machinery may add to production but by better efficiency and not through any substantial increase in the production facilities.
3. When there is scope for incremental improvement of functional performance in the same line of business, the organization should go for stability strategy. This is the motto of taking fullest advantages of the situation.

Though most of the organizations follow stability strategy for a period of time, some organizations follow it for much longer than others. It has been observed that as the companies get older, they become more conservative and more likely to pursue a stability strategy.

Following are some important factors which suggest why the organizations follow stability strategy:

1. Perception of management about the performance of the organization may motivate it to pursue stability strategy. If the managers are satisfied with present performance, they will like to continue with the same.

2. A stability strategy is less risky in that it offers the safe business to the organization unless there is major environmental change. If management prefers to take less risk, it can continue stability strategy.

3. Some organizations are slow to change or resistant to change. Since stability strategy fits in their total framework, they often prefer not to change.

4. If the organization's past history is full of change, it will like to adopt stability so as to become efficient and manageable and to reap the rich harvest of all such past changes. In fact, stability strategy should always be followed after the growth strategy to take the best advantages of the situation.

5. If the organization's competitive advantage lies in the present business and market, it pursues stability strategy.

   The stability strategy is basically defensive in its approach. It may be pursued to protect certain present organizational strengths, e.g., certain patent right, technical collaboration, etc. It is implemented on the basis of 'steady as it goes' approach to decision on the level of business definition and business objective. There is not much functional change in any part of the organization.

(ii) Market Challengers:

Market challengers are the firms that have second or lower ranking in the industry concerned. Some of the market challengers in Indian industry are Bajaj Auto (motorcycles), ICICI Prudential Mutual Fund (mutual fund), Ashok Leyland (heavy commercial vehicles), and so on. Market challengers can either challenge the market leaders or choose to follow them closely. Various types of actions that market challengers adopt are as follows:

(a) Frontal attack involving matching the opponent, in terms of the product/ service features, pricing, promotion, and distribution.

(b) Flank attack involving challenging the opponent's weak or uncovered geographical or segmental areas.

(c) Encirclement attack involving a grand move to capture the opponent's market share through launching an advertising attack, making an unbeatable product/service-related offering, or presenting a unique service guarantee.

(d) Bypass attack involving ignoring the opponent and attacking the easier markets by means of diversifying into unrelated products, moving into new geographical areas, or leapfrogging into new technologies.

(e) Guerrilla attack involving small intermittent attacks to harass or demoralise the opponent through price cuts, price discounts, intensive comparative advertising, etc

Question 2(c):

(i) Explain 'Vertical Integration Strategy' and list out benefits of undertaking it.
(ii) Enumerate the risks associated with Cost Leadership Strategy.

[(4+6) + 5=15]

Answer:

(i) Vertical Integration Strategy:

Vertical integration is the combination of technologically distinct production, distribution, and other economic processes within the confines of a single organization. As such, it represents a decision by an organization to utilise internal or administrative transactions rather than market transactions to accomplish its objectives. In theory, all functions that we expect a single organization to perform can be performed by a consortium of independent entities each contracting with a central coordination. However, in most situations, organizations find it advantageous to perform a significant proportion of the administrative, productive, distributive, or marketing process required to produce their products in-house rather than through contracts with a series of independent entities. Thus, they go for vertical integration.

Vertical integration can be achieved in two ways: forward and backward. In forward integration, the organization develops outlets for the use/sale of its products, for example, a TV picture tube manufacturing organization going for manufacturing of TV sets which uses its own picture tubes. In backward integration, additional processing is undertaken in reverse direction, for example, a fabric manufacturing unit adding spinning unit.

Many organizations have gone for vertical integration, either forward or backward, for example, Reliance (backward), Bombay Dyeing (backward), many spinning units (forward), etc. However, vertical integration is not always profitable but has some costs. Therefore, management should be aware of various benefits and costs of vertical integration

Benefits of Vertical Integration

Vertical integration has many benefits which differ greatly depending on the particular industry and the strategic situation of the organization. Further, these are also affected by the type of integration—forward or backward—under consideration. The strategic benefits that accrue out of vertical integration are of the following types:

1. **Economies of Integration.** Vertical integration offers economies of scale provided the volume of throughput is sufficient to reap the benefits of economies of scale. In such a situation, benefits of the following types are available:

(a) The organization can take the advantages of combined operation by putting technologically distinct operations together.

(b) The organization can save cost of internal control and coordination. The cost of scheduling, coordinating operations, and responding to emergencies may be lower in an integrated organization as most of the supplies are available from internal source.

(c) The integrated organization can have economies of information. The fixed cost of monitoring the market and predicting supply, demand, and prices can be spread over all parts of the integrated organization whereas they would have to be borne by each unit in an unintegrated organization.

(d) The integrated organization can save the cost of selling, price shopping, negotiating, and transactions. The availability of various types of economies depends on the type of the organization, its strategy, and strengths and weaknesses.

2. **Assured Supply and/or Demand.** Vertical integration assures the organization that it will receive supplies in tight periods or that it will have an outlet for its products in periods of low overall demand. However, the ability of downstream unit to absorb the output of the upsteam unit depends on the effect of competitive conditions on the demand of the downstream unit. If demand is down in the downstream industry, the sales of the downstream unit may also be low, and consequently needs for the input of its internal supplies will be low. Thus, integration may only reduce the uncertainty that the organization will be arbitrarily cut off by its customers rather than assume demand in the literal sense. This reduction of uncertainty is important specially when one or both stages are capital intensive, for example, petroleum, steel, and aluminum industry.

3. **Offsetting Bargaining Power.** If an organization is dealing with suppliers who exert considerable bargaining power and reap returns on investment in excess of the opportunity cost of the capital, it is better to integrate the organization. Offsetting bargaining power through integration may not only lower costs of supplies in the case of backward integration or raise realisation in the case of forward integration but also allows the organization to operate more efficiently by eliminating otherwise valueless practices used to cope with the powerful suppliers or customers. Backward integration has another benefit beside offsetting bargaining power. Internalising the profits earned by suppliers of an input can reveal the true costs of that input. The organization then has the choice of adjusting the price of final products to maximise overall profit of the two entities before integration. Further, the organization will be in a better position to change the mix of various inputs used in the downward business production process. This decision, however, depends on the ability of the downstream unit to vary the mix of its inputs.

4. **Enhanced Ability to Differentiate.** Vertical integration can improve the ability of the organization to differentiate itself from others by offering a wide range of value addition

under the control of management because the organization can control more elements of the production process of the way the product is sold.

5. **Elevates Entry and Mobility Barriers.** If vertical integration achieves some of the above benefits, it can raise mobility barriers. The integrated organization derives some advantages over the unintegrated one in the form of lower costs, lower price, lower risk, etc. Therefore, the unintegrated organization cannot compete with an integrated organization. This also does not allow the new entrant without integration because of cost factor and the investment requirement for a new integrated organization may be high enough to dissuade it to enter the field. If the scale economies and capital requirements are not significant, the integration may not have significant advantage or may not act as entry barrier.

(ii) Risks Associated with Cost Leadership Strategy

There are certain risks associated with cost leadership strategy which are as follows:

1. A basic question in cost leadership strategy without some kind of differentiation is: how long is it a source of sustainable competitive advantage? It can be sustained only if barriers exist that prevent competitors from achieving the same low cost. However, in the era of technological development and innovation, organizations constantly leapfrog over one other in pursuit of lower cost. With decreasing national and international barriers, sustaining cost leadership requires continuous efforts for being cost effective.

2. Sometimes, cost leadership strategy becomes less market friendly. Often, over-emphasis on cost reduction leads to diluting customer focus and limits experimentation with product value addition.

3. If cost leader is able to garner a significant market share, often, less cost-efficient organizations prefer to leave the field. This phenomenon leads to market stagnation as innovative methods are unlikely to be adopted for market development. This affects the cost leader too.

Question 3: **[20 Marks]**

Read the case and answer the following questions:

Timex makes digital watches. Timex is preparing a product life-cycle budget for a new watch, MX3. Development on the new watch is to start shortly. Estimates for MX3 are as follows:

Life-cycle units manufactured and sold	**4,00,000**
Selling Price per watch (₹)	**400**

Life-cycle costs

R&D and design costs (₹)	**1,00,00,000**

Manufacturing

Variable Cost per watch (₹)	**150**
Variable Cost per Batch (₹)	**6,000**
Watches per Batch	**500**
Fixed Costs (₹)	**1,80,00,000**

Marketing

Variable cost per watch (₹)	**32**
Fixed Costs (₹)	**1,00,00,000**

Distribution

Variable Cost per batch (₹)	**2800**
Watches per batch	**160**
Fixed Costs (₹)	**72,00,000**
Customer Service per watch (₹)	**15**

Ignore the time value of money.

Required:

1. **Calculate the budgeted life-cycle operating income for the new watch.**
2. **What percentage of the budgeted total product life-cycle costs will be incurred by the end of the R&D and design stages?**
3. **Ana analysis reveals that 80% of the budgeted total product life-cycle costs of the new watch will be locked in at the R&D and design stages. What are the implications for managing MX3's costs?**
4. **Timex's Market Research Department estimates that reducing MX3's price by ₹30 will increase life-cycle unit sales by 10%. If unit sales increase by 10%, Timex plans to increase manufacturing and distribution batch sizes by 10% as well. Assume that all variable costs per watch, variable costs per batch and fixed costs will remain the same. Should Timex reduce MX3's price by ₹ 30? Show your calculations.**

[7+3+3+7 = 20]

Answer:

1. Life –cycle product costing:

Revenues [₹ 400 × 4,00,000]	₹16,00,00,000
R&D and design costs	₹ 1,00,00,000
Manufacturing Costs:	

• Variable [₹ 150 × 4,00,000]	₹ 6,00,00,000
• Batch [WN 1]	₹ 48,00,000
• Fixed	₹ 1,80,00,000
Marketing Costs:	
• Variable [₹ 32 × 4,00,000]	₹ 1,28,00,000
• Fixed	₹ 1,00,00,000
Distribution Costs:	
• Batch [WN 2]	₹ 70,00,000
• Fixed	₹ 72,00,000
Customer Service Costs:	
• Variable [₹ 15 × 4,00,000]	₹ 60,00,000
Total costs	₹ 13,58,00,000
∴ Operating income	₹ 2,42,00,000

∴ The budgeted life-cycle operating income for the new watchMX3 is ₹ 2,42,00,000

Working Note 1:

Number of batches = $\frac{4,00,000}{500}$ = 800 batches

∴ Batch Cost = ₹ 6,000 × 800 = ₹ 48,00,000

Working Note 2:

Number of batches = $\frac{4,00,000}{160}$ = 2,500 batches

∴ Batch Cost = ₹ 2,800 × 2,500 = 70,00,000

2. Budgeted product life-cycle costs for R&D and design:

Total budgeted product life-cycle costs	₹1,00,00,000
Total costs	₹13,58,00,000

∴ Percentage of budgeted product life-cycle costs incurred till the R&D and design stages is

$$= \frac{1,00,00,000}{13,58,00,000} \times 100 = 7.36\%$$

3. Discussion on the analysis:

An analysis reveals that 80% of the total product life-cycle costs of the new watch will be locked in at the end of the R&D and design stages when only 7.36% of the costs are incurred (as calculated in the above case). The implication is that it will be difficult to alter or reduce

the costs of MX3 once Timex finalises the design of MX3. To reduce and manage total costs, Timex must act to modify the design before costs gets locked in.

4. Analysis of the proposition of reducing MX3's price by ₹30:

Revised Life –cycle product costing:

Revenues [₹ 370 × 4,40,000]	₹16,28,00,000
R&D and design costs	₹ 1,00,00,000
Manufacturing Costs:	
• Variable [₹ 150 × 4,40,000]	₹ 6,60,00,000
• Batch [WN 1]	₹ 48,00,000
• Fixed	₹ 1,80,00,000
Marketing Costs:	
• Variable [₹ 32 × 4,40,000]	₹ 1,40,80,000
• Fixed	₹ 1,00,00,000
Distribution Costs:	
• Batch [WN 2]	₹ 70,00,000
• Fixed	₹ 72,00,000
Customer Service Costs:	
• Variable [₹ 15 × 4,40,000]	₹ 66,00,000
Total costs	₹ 14,36,80,000
∴ Operating income	₹ 1,91,20,000

The budgeted life-cycle operating income for the new watch MX3 if Timex reduces its price by ₹ 30 is ₹ 1,91,20,000, as calculated above. This is less than the operating income of ₹ 2,42,00,000 as calculated, without the reduction in price.

∴ Timex should not reduce the price of MX3 in this case.

Working Note 1:

Number of batches = $\frac{4,40,000}{550}$ = 800 batches

∴ Batch Cost = ₹ 6,000 × 800 = ₹ 48,00,000

Working Note 2:

Number of batches = $\frac{4,40,000}{176}$ = 2,500 batches

∴ Batch Cost = ₹ 2,800 × 2,500 = 70,00,000

Question 4: Answer any two questions **[30 Marks]**

Question 4(a)(i):

A. Radha Tours and Travels Ltd, comprises of three divisions viz. Buses, Taxis and Maintenance. Buses division operates a fleet of 8 vehicles on four different routes in Kolkata city. Each vehicle has a capacity of 30 passengers. There are two vehicles assigned in each route, and each vehicle completes five return journeys per day for six days in each week, for 52 weeks a year. The division is considering its plans for the year ending on 31st March, 2016.

Data in respect of each route is given below:

Particulars	North	South	West	East
Return Travel distance (Kms)	42	36	44	38
Average number of passengers:				
• Adult	15	10	25	20
• Children	10	8	5	10
Return Journey Fares (₹):				
• Adult	3.00	6.00	4.50	2.20
• Children	1.50	3.00	2.25	1.10

The following cost estimates have been made:

- **Fuel and Repairs per kilometer** **₹ 0.1875**
- **Drivers wages per vehicle per work-day** **₹ 120**
- **Vehicles Fixed Cost per annum** **₹ 2,000**
- **General Fixed Cost per annum** **₹ 3,00,000**

Required:

1. **Prepare a statement showing the planned contribution of each route and the Total contribution and profit of the buses division for the year ending 31st March, 2016.**
2. **Calculate the effect on contribution of route North of increasing the adult fare to ₹ 3.75 per return journey if this reduces the number of adult passengers using this route by 20% and assuming that the ratio of Adults to Child passengers remain same. Recommend whether or not the buses division should amend the Adult fare on route North.**

B. The Maintenance Division comprises 2 fitters who are paid an annual salary of ₹ 15,808 each, and a Transport Supervisor who is paid an annual salary of ₹ 24,000. The work of Maintenance Division is to repair and service the buses and taxis of the company. In total there are 8 buses and 6 taxis which need to be maintained.

Each Vehicle requires routine servicing on a regular basis on completion of 4,000 kilometers. Every two months each vehicle is fully tested for safety. The Maintenance Division is also responsible for carrying out any breakdown work, though the amount of regular servicing is only 10% of the Division's work.

The annual distance travelled by each taxi is 1,28,000 kilometers. The projected Material Costs associated with each service and Safety Check are ₹ 100 nad ₹ 75 respectively.

The Directors of the Company are concerned over the efficiency and cost of its own Maintenance Division. The Company invited its Local Garage to tender for the Maintenance Contract for its fleet and the quotation received was for ₹ 90,000 per annum including parts and labour.

If the Maintenance Contract is awarded to the Local Garage, then the Maintenance Division will be closed down, and the two fitters made redundant with a redundancy payment being made of 6 months salary to each fitter. The Transport Supervisor will be retained at the same salary and would be deployed elsewhere in the Group instead of recruiting a new employee at an annual salary cost of ₹ 20,000.

Required:

1. **Calculate the cost of the existing maintenance function.**
2. **Advise the company whether to award the Maintenance Contract to the Local to the Local Garage on financial grouds.**

[(4+2) + (3+3) = 12]

Answer 4(a)(i):

A.

1. **Preparation of Statement showing planned contribution of each route and the Total Contribution and Profit of the buses division for the year ending 31st March, 2016.**

Number of trips per annum = 5 trips × 2 buses per route × 6 days × 52 weeks = 3,120 trips (two-way trips)

WN – 1: Revenue per annum

Particulars	North	South	West	East
(a) Number of Trips per annum	3120	3120	3120	3120
(b) Average No. of Passenger - Adults	15	10	25	20
(c) Return Journey Fares – Adults (₹)	3.00	6.00	4.50	2.20
(d) Total collection from Adults (₹) [a × b × c]	1,40,400	1,87,200	3,51,000	1,37,280
(e) Average No. of Passenger - Children	10	8	5	10
(f) Return Journey Fares – Children (₹)	1.50	3.00	2.25	1.10
(g) Total collection from Children (₹) [a × e × f]	46,800	74,880	35,100	34,320

(h) Total Collection [d + g]	1,87,200	2,62,080	3,86,100	1,71,600

WN – 2: Costs of Routes per annum

Particulars	North	South	West	East
(a) Number of Trips per annum	3120	3120	3120	3120
(b) Return travel distance (kms)	42	36	44	38
(c) Total distance covered p.a [a × b]	1,31,040	1,12,320	1,37,280	1,18,560
(d) Fuel and Repairs costs @ ₹ 0.1875 (₹)	24,570	21,060	25,740	22,230
(e) Number of work days 52 weeks × 6 days	312	312	312	312
(f) Driver's wages (₹) [(e) × ₹ 120 ×2 buses per route]	74,880	74,880	74,880	74,880

Statement of Profitability (₹)

Particulars	North	South	West	East	Total
Total Revenue Collection [WN 1]	1,87,200	2,62,080	3,86,100	1,71,600	
(-) Fuels & Repairs Cost [WN 2]	24,570	21,060	25,740	22,230	
Gross Contribution	1,62,630	2,41,020	3,60,360	1,49,370	
(-) Driver's Wages [WN 2]	74,880	74,880	74,880	74,880	
(-) Vehicle Fixed Costs [₹ 2,000 × 2 vehicles]	4,000	4,000	4,000	4,000	
Net Contribution	83,750	1,62,140	2,81,480	70,490	5,97,860
(-) General Fixed Costs					3,00,000
Net Profit for the year					2,97,860

2. Calculation of the effect of Fare Change Proposal

Evaluation of the Fare Change Proposal

Particulars	Present	Proposed
Number of Passengers:		
• Adults	15	15- 20% = 12
• Children	10	(Ratio = 3:2) = 8
Return Journey Fare (₹)		
• Adults	3.00	3.75
• Children	1.50	1.50
Total Collection (₹)	[(15 × 3) + (10 ×1.50)] = 60	[(12 × 3.75) + (8 ×1.50)] = 57

The Fare reduction proposal will result in a reduction by [₹60 - ₹ 57] = ₹ 3 in terms of contribution per Return Journey. Hence, it is not worthwhile.

B.

1. Calculation of the existing maintenance function

Particulars	Computation	₹
Salary of Fitter	₹15,808 × 2 Fitters	31,616
Salary of Transport Supervisor	Given	24,000
Service Cost of Buses	$\frac{(1,31,040+1,12,320+1,37,280+1,18,560)}{4,000} \times$ ₹100	12,480
Service Cost of Taxis	$\frac{1,28,000}{4,000} \times 6 \text{Taxis} \times$ ₹100	19,200
Safety Check Cost of Buses	8 buses × 6 Checks p.a. × ₹75	3,600
Safety Checks Cost of Taxis	6 Taxis × 6 Checks p.a. × ₹75	2,700
Total Costs		93, 596

2. Evaluation of Relevant Costs for Maintenance Contract:

Particulars	₹
Cost per annum for own maintenance function [₹ 93,596 + ₹ 20,000 (Cost of new employee)]	1,13,596
Cost per annum for Maintenance Contract	90,000
Cost Savings due to Maintenance Contract	23,596

Decision:

- The Maintenance Contract should be accepted, since there is a cost savings of ₹ 23,596.
- However, it is to be noted that, in the first year the savings due to Maintenance Contract would be:
  [₹ 23,596 - ₹ 15,808] = ₹ 7,788.

Question 4(a)(ii):

Do you think that prices can be fixed above Marginal Cost but below Total Costs? 3

Answer 4(a)(ii):

In this case there should be use of Differential Selling Price, which is above Marginal Cost but below Total Cost, is primarily intended to absorb surplus capacity. It can be achieved in any of the following ways –

1. **Different Markets (e.g. Export Pricing):** The Firm producing a branded article may use the surplus capacity to produce the same article to be sold above Variable Cost in a different market, e.g. Export Sales. The articles sold in home market will recover all Fixed Expenses. Price reduction in the local market will reflect on sales value and profits, and is not resorted to. Any reduction in the selling prices in the export markets will not affect the price prevailing in the home market.

2. **Different products:** The firm may produce and sell one product, which covers the entire Fixed Overheads and use the surplus capacity to produce another product, which may be sold at a price above its Marginal Cost. The overall profitability will thus increase. The manufacture of the second product should be confined to surplus capacity, and it should have the possibility of becoming a major product at the low price at which it is sold. If it becomes so, there will be a reduction in profit.

Question 4(b)(i):

Jyoti Ltd has a dedicated set of Production Facilities for Component X. The Company operates a JIT system and no Stocks of Materials, WIP or Finished Goods are held.

At the beginning of Year 1, the planned information relating to the production of Component X through the dedicated facilities is as follows -

1. **Every unit of Component X requires 3 units of Material A at ₹ 18 per unit and 2 units of Material B at ₹ 9 per unit.**
2. **Variable Cost per unit of Component X (excluding materials) is ₹ 15 per unit worked on.**
3. **Fixed Costs of the dedicated facilities for Year 1: ₹1,62,000.**
4. **It is anticipated that 10% of the units of X worked on in the process will be defective and will be scrapped.**
5. **It is estimated that customers will require replacement (free of charge) of faulty units of Component X at the rate of 2% of the quantity invoiced to them in fulfillment of orders.**

The Company is pursuing a TQM Philosophy. Consequently, all losses will be treated as abnormal in recognition of a zero defect policy and will be valued at Variable Cost of Production.

Actual figures for Years 1 to 3 for Component X are shown below. No changes have occurred from the planned price levels from Materials, Variable Overhead or Fixed Overhead Costs.

Particulars	Year 1	Year 2	Year 3
Invoiced to Customers (units)	5,400	5,500	5,450
Worked on in the process (units)	6,120	6,200	5,780
Total Costs:			
Materials A and B	₹ 4,40,640	₹ 4,46,400	₹ 4,16,160
Variable Costs of Production (excluding Materials)	₹91,800	₹ 93,000	₹86,700
Fixed Costs	₹1,62,000	₹ 1,77,000	₹1,85,000

Required:

1. **For Year 1:**
   - **(a) Prepare an analysis of the actual figures relating to Year 1 to show that Year 1 Actual Results were achieved at the planned level in respect of - (i) quantities and losses, and (ii) Unit Cost Levels for Material and Variable Costs.**
   - **(b) Use your analysis from (1) above, to calculate the amount of the Planned Level of**

each of Internal Failure and External Failure Costs for Year 1.

2. **For Years 2 and 3:**
   Actual Free Replacement of Component X to Customers were 170 units and 40 units in Years 2 and 3 respectively. The Company authorized additional expenditure during Years 2 and 3 as follows:
   - **Year 2: Equipment Accuracy Checks ₹ 10,000 and Staff Training Costs ₹ 5,000.**
   - **Year 3: Equipment Accuracy Checks ₹ 10,000, Inspection Costs ₹ 5,000, Staff Training Costs ₹ 3,000 on extra Planned Maintenance of Equipment.**

   (a) Prepare an analysis for each of Year 2 and 3 which reconcile the number of components invoiced to customers with those worked-on in the production process. Show the change from the planned quantity of process losses and changes from the planned quantity of replacement of faulty components in customer hands, in the above analysis.
   (b) Prepare a Cost Analysis for each of Years 2 and 3 which shows actual Prevention Costs, Appraisal Costs Internal Failure Costs, and External Failure Costs.

3. **Prepare a report which explains the meaning and inter-relationship of figures in Years 1 to 3 as given above, and in your analysis in (1), and (2) above. The report should also give examples of each cost type and comment on their use in the monitoring and progressing of the TQM Policy being pursued by the Company.**

[(3+1) + (2+2) + 4]

Answer 4(b)(i):

1.

Actual vs. Planned Results for Year 1
(a) (i) Quantities and Losses

Particulars	Units
Components worked on in the process (given)	6,120
Less: Planned defective units (10% of the above)	(612)
Less: Replacements to customers (2% × 5,400)	(108)
Components invoiced to Customers (given)	5,400

Thus, Actual Results agree with Planned Results, in terms of quantities and losses.

(a) (ii) Unit Cost Levels for Materials and Variable Costs

Particulars	Actuals per unit	Planned Per Unit
Materials A and B	$\frac{₹4,40,640}{6,120 \text{ units}} = ₹ 72$	(Material A 3 units × ₹18) + (Material B 2 units × ₹ 9) = ₹ 72
Other Variable Costs	$\frac{₹91,800}{6,120 \text{ units}} = ₹ 15$	Given = ₹ 15
Total	₹ 87	₹87

Thus, Actual Results agree with Planned Results, in terms of Unit Costs for Materials A and B, and Other Variable Costs.

1 (b) Internal Failure Costs = (612 units × ₹ 87) = ₹ 53,244.
External Failure Costs = (108 units × ₹ 87) = ₹ 9,396

2.

(a) Reconciliation of Quantities and Losses for Years 2 and 3

Particulars	Year 2 (units)	Year 3 (units)
Components invoiced to Customers	5,500	5,450
Add: Planned Replacement (2% of above)	110	109
(+/-) Unplanned Replacement	170-110 = 60	40 - 109 = - 69
Components delivered to Customers	5,670	5,490
Add: Planned Process Defects (10% of units worked on) (given)	620	578
Less: Unplanned Defects (balancing figure)	-90	-288
Components worked on in the process (given)	6,200	5,780

(b) Costs of Quality for Years 2 and 3

Particulars	Year 2	Year 3
1. Prevention Costs: Staff Training	₹ 5,000	₹ 8,000
2. Appraisal Costs: Equipment Accuracy Checks + Inspection Costs	₹ 10,000	₹ 15,000
3. Internal Failure Costs: Net Process Defects Quantity × ₹ 87 per unit	(620 - 90) × ₹ 87 = ₹ 46,110	(578 - 288) × ₹ 87 = ₹ 25,230
4. External Failure Costs: Net Replacement Quantity × ₹ 87 per unit	(110 + 60) × ₹ 87 = ₹ 14,790	(109 - 69) × ₹ 87 = ₹ 3,480

3. Reporting and Analysis:

The following points should be included in the report -

(a) There is insufficient detail in the actual data. So, there is a need for an improvement in COQ Reporting.

(b) Analysis in 2 (a) indicates that free replacements to customers were 60 units higher than planned in Year 2 but approximately 70 less than planned in Year 3. However, in contrast, the in-process defects were 90 less than planned (about 15%) in Year 2 and 288 less than plan (approximately 50%) in Year 3.

(c) The impact on Customer Goodwill from the reduction in replacements should also be examined.

(d) Internal Failure Costs show a decreasing trend from Years 1-3 with a substantial decline in Year 3. External Failure Costs have increased in Year 2 but declined significantly in Year 3.

(e) The Cost Savings in Years 2 and 3 are as follows:-

Particulars	From Year 1 to Year 2	From Year 2 to Year 3
Prevention Costs	Increase ₹ 5,000	Increase ₹ 8,000
Appraisal Costs	Increase ₹ 10,000	Increase ₹ 15,000
Internal Failure Costs	(53,244 - 46,110) = Decrease ₹ 7,134	(46,110 - 25,230) = Decrease ₹ 20,880
External Failure Costs	(9,396 - 14,790) = Increase ₹ 5,394	(14,790 - 3,480) = Decrease ₹ 11,310
Net Incr. / (Deer.) in Costs	Increase ₹ 13,260	Decrease ₹ 9,190

There has also been an increase in External Failure Costs from Year 1 and 2. Investigations should be made relating to the likely time lag from incurring Prevention / Appraisal Costs and their subsequent benefits.

Question 4(b)(ii):

From the following information, calculate Labour Cost Variance, Labour Rate Variance and Labour Efficiency Variance:

Standard rate per hour – ₹ 4.00
Standard time per unit of output - 20 hours
Units produced - 500
Actual hours worked - 12,000
Actual labour cost – ₹ 38,400. **3**

Answer 4(b)(ii):

Working Note:
(1) Standard labour hours required for actual output = 500 units × 20 hours = 10,000 hours

Labour Cost Variance = (Standard labour cost of actual output - Actual labour cost)

Alternatively,
Labour Cost Variance = (SH x SR) - (AH x AR)
where,
SH = Standard hours required for actual output = 10,000 hours (Note 1)
SR = Standard labour hour rate = ₹ 4
AH = Actual hours worked = 12,000 hours
AR=Actual labour hour rate =₹ 3.20 (₹ 38,400/12,000)

Labour Cost Variance = (10,000 hours x ₹ 4) - (12,000 hours x ₹ 3.20)
= ₹ 40,000 – ₹38,400.
= ₹ 1,600 (Favourable)

Labour Rate Variance = Actual hours worked x (Standard labour hour rate - Actual labour hour rate)

Alternatively,
Labour Rate Variance = AH x (SR - AR)
= 12,000 hours x (₹ 4 – ₹ 3.20)
= ₹ 9,600 (Favourable).

Labour Efficiency Variance = Standard labour hour rate x (Standard labour hours required for actual output - Actual labour hours worked)

Alternatively,
Labour Efficiency Variance = SR x (SH - AH)
= ₹ 4 × (10,000 hours -12,000 hours) = ₹ 8,000 (Adverse)

Check:
Labour Cost Variance = Labour Rate Variance + Labour Efficiency Variance
₹ 1,600 (Favourable) = 9,600 (Favourable) + ₹ 8,000 (Adverse).

Question 4(c)(i):

A Car Rental Agency has collected the following data on the demand for five-seater vehicles over the past 50 days.

Daily Demand	4	5	6	7	8
No. of days	4	10	16	14	6

The Agency has only 6 cars currently.

1. **Use the following 5 Random Numbers to generate 5 days of demand for the Rental Agency.**
   Random Nos: 15, 48, 71, 56, 90
2. **What is the average number of Cars rented per day for the 5 days?**
3. **How many rentals will be lost over the 5 days?**

3

Answer 4(c)(i):

Random Numbers Allocation Table

Cars	Probability	Cumulative Prob.	Random Nos.
4	$\frac{4}{50} = 0.08$	0.08	00-07
5	$\frac{10}{50} = 0.20$	0.28	08-27

6	$\frac{16}{50} = 0.32$	0.60	28-59
7	$\frac{14}{50} = 0.28$	0.88	60-87
8	$\frac{6}{50} = 0.12$	1.00	88-99

Simulation Table

Day	R. No.	Demand	Rentals lost for
1	15	5 Cars	-
2	48	6 Cars	-
3	71	7 Cars	1 Car
4	56	6 Cars	-
5	90	8 Cars	2 Cars
Total		**32 Cars**	**3 Cars**

$$\text{Average Demand} = \frac{32 \text{ Cars}}{5 \text{ days}} = 6.4 \text{ Cars per day}$$

Question 4(c)(ii):

A Company has two divisions. Division A and Division B. Both divisions of the Company manufacture the same product but located at two different places. The annual output of Division A is 6,000 tons (at 80% capacity) and that of Division B is 7,500 tons (at 60% capacity). The basic Raw Material required for production is available locally at both the places, but at Division A, it is limited to 4,000 tons per annum at the rate of ₹ 100 per ton, at Division B, it is limited to 8,000 tons per annum at the rate of ₹ 110 per ton. Any additional requirement of Material will have to be purchased at a rate of ₹ 125 per ton from other markets at either of division. Variable Costs per ton at each division remain constant. For every 1,000 tons of output, 800 tons Raw Material is required. The details of other costs of the divisions are as follows:

Particulars	Division A	Division B
Other Variable Costs of output (₹)	**122 per ton**	**120 per ton**
Fixed Cost per annum (₹)	**3,80,000**	**6,00,000**

Required:

1. **Calculate Variable Cost per ton for each division's product and decide ranking in order of preference.**
2. **The Company desires to fully utilize the available local supplies of Raw Material to save the Overall Variable Cost of production, keeping the total production of both the divisions putting together is the same as at present level. Calculate the quantity of production (output) that could be transferred between the two divisions and overall saving in Variable Cost.**
3. **After considering the option (2), how the balance capacity should be utilized, if the Company is working at 100% capacity, and also calculate Selling Price per ton, if**

Company wants a mark-up 10% on full cost of each division's product.

[4 + 4 + 4 = 12]

Answer 4(c)(ii):

1. Computation of Variable Cost per Ton

Particulars	Division A	Division B	Total
(a) Annual Output	6,000 Tons	7,500 Tons	13,500 Tons
(b) Raw Material required	6,000 x 80% = 4,800 Tons	7,500 x 80% = 6,000 Tons	10,800 Tons
(c) Raw Materials available locally	(Given) 4,000 Tons	(Given) 8,000 Tons	12,000 Tons
(d) Cost of RM purchased locally	4,000 Tons x ₹ 100 = ₹ 4,00,000	6,000 Tons x ₹ 110 = ₹ 6,60,000	₹ 10,60,000
(e) Cost of RM Purchased from other markets	800 Tons x ₹ 125 = ₹ 1,00,000	Nil	₹ 1,00,000
(f)Total Cost of RM purchased (d+e)	₹ 5,00,000	₹ 6,60,000	₹ 11,60,000
(g) Other Variable Cost	6,000 tons x ₹ 122 = ₹ 7,32,000	7,500 tons x ₹ 120 = ₹ 9,00,000	₹ 16,32,000
(h) Total Variable Cost (f + g)	₹ 12,32,000	₹ 15,60,000	₹ 27,92,000
(i) Cost per ton of Output (h ÷ a)	205.33	208.00	
(j) Rank based on priority	I	II	

Alternative Approach for Ranking:

Particulars	Division A		Division B	
Usage of	Local RM	Outside RM	Local RM	Outside RM
(a) RM as % of FG	80%	80%	80%	80%
(b) RM Price per Ton	₹ 100	₹125	₹ 110	₹125
(c) RM Cost per Ton of FG (a x b)	₹80	₹ 100	₹88	₹100
(d) Other Variable Cost per Ton of FG	₹ 122	₹ 122	₹120	₹120
(e) Total Variable Cost per Ton of FG	₹202	₹222	₹208	₹220
(f) Rank	I	IV	II	III

2. Quantity of production based on Local Purchases

Present Total Output = 6,000+7,500 = 13,500 Tons. This should be retained only by local supplies, as under:

Particulars	Division A	Division B	Total
(a) Present Output (FG)	6,000 Tons	7,500 Tons	13,500 Tons
(b) Capacity Utilisation	80%	60%	
(c)Total Capacity of Output (FG)	$\frac{6,000\ MT}{80\%}$ = 7,500 Tons	$\frac{7,500\ MT}{60\%}$ = 12,500 Tons	

(d) Raw Material available locally	4,000 Tons	8,000 Tons	
(e) Possible Production from locally available Raw Material	$\frac{4,000\ MT}{80\%}$ = 5,000 Tons	$\frac{8,000\ MT}{80\%}$ = 10,000 Tons	
(f) Revised Output using local purchases only (Total = 13,500 MT)	5,000 Tons (maximum)	8,500 Tons (balancing figure)	
(g) Cost of Material Purchases	4,000 Tons x ₹ 100 per Ton = ₹ 4,00,000	8,500 tons x 80% x ₹ 110 = ₹ 7,48,000	₹ 11,48,000
(h) Other Variable Costs	5,000 Tons x ₹ 122 per Ton = ₹ 6,10,000	8,500 MT x ₹ 120 = ₹ 10,20,000	₹ 16,30,000
(i) Total Variable Costs (g+h)	₹ 10,10,000	₹ 17,68,000	₹ 27,78,000

Overall Savings in Variable Costs = ₹ 27,92,000 - ₹ 27,78,000 = ₹ 14,000.

3. If Company is working at 100% Capacity

	Particulars	Division A	Division B	Total
(a)	100% Capacity Finished Goods Output	7,500 Tons	12,500 Tons	20000 Tons
(b)	Raw Material required at 80% thereon	6,000 Tons	10,000 Tons	
(c)	Raw Material locally (max)	4,000 Tons	8,000 Tons	
(d)	Balance RM purchased at other mkts (b - c)	2,000 Tons	2,000 Tons	
(e)	Cost of locally purchased Raw Material	4,000 Tons x ₹ 100 = ₹ 4,00,000	8,000 Tons x ₹ 110 = ₹ 8,80,000	₹ 12,80,000
(f)	Cost of Raw Material purchased at other mkts	2,000 Tons x ₹ 125 = ₹ 2,50,000	2,000 Tons x ₹ 125 = ₹ 2,50,000	₹ 5,00,000
(g)	Other Variable Costs	7,500 Tons x ₹ 122 = 19,15,000	12,500 Tons x ₹120 = ₹ 15,00,000	₹ 24,15,000
(h)	Fixed Costs (given)	₹ 3,80,000	₹ 6,00,000	₹ 9,00,000
(i)	Total Costs (e + f + g + h)	₹ 19,45,000	₹ 32,30,000	₹ 51,75,000
(j)	Add: Mark-up at 10% on Full Cost	₹ 1,94,500	₹ 3,23,000	₹ 5,17,500
(k)	Desired Sales Value (i + j)	₹ 21,39,500	₹ 35,53,000	₹ 56,92,500
(l)	Average Selling Price per ton (k ÷ a)	₹ 285.27	₹ 284.24	284.63