

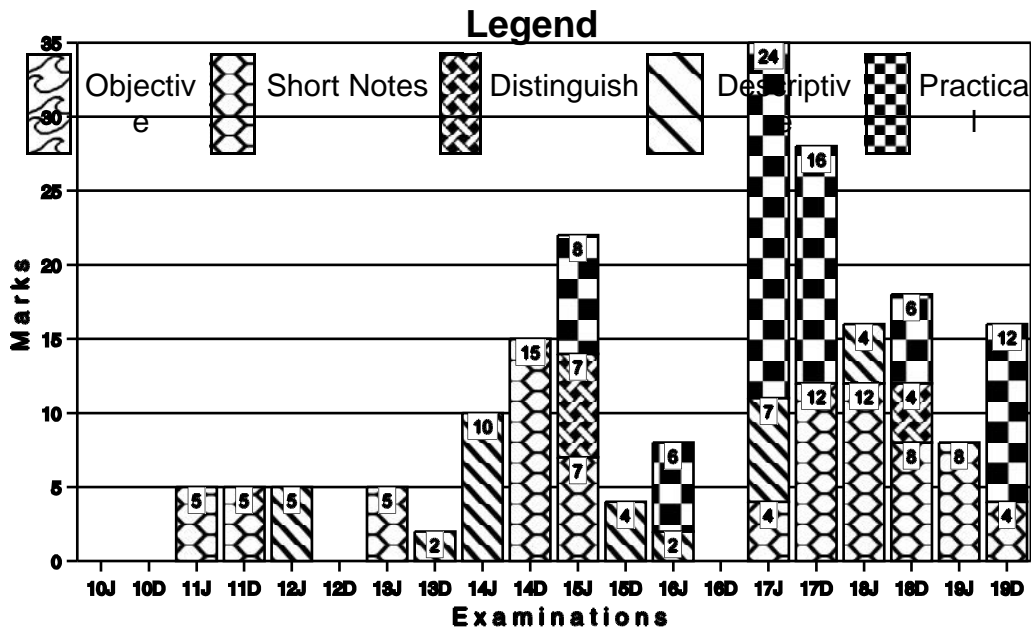
# 1

## COST MANAGEMENT

### THIS CHAPTER INCLUDES

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| <ul style="list-style-type: none"> <li>• Life Cycle Costing</li> <li>• Target Costing</li> <li>• Kaizen Costing</li> <li>• Value Analysis and Value Engineering</li> <li>• Throughput Costing</li> </ul> | <ul style="list-style-type: none"> <li>• Business Process Re-engineering</li> <li>• Back-flush Accounting</li> <li>• Lean Accounting</li> <li>• Socio Economic Costing</li> <li>• Cost Control and Cost Reduction</li> </ul> |
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Marks of Objective, Short Notes, Distinguish Between, Descriptive & Practical Questions



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## CHAPTER AT A GLANCE

### Meaning of Life Cycle Costing

Life Cycle Costing aims at cost ascertainment of a product, project etc. over its projected life.

It is a system that tracks and accumulates the actual costs and revenues attributable to cost object (i.e.; product) from its inception to its abandonment.

### Meaning of Product Life Cycle

Product Life Cycle is a pattern of expenditure, sale level, revenue and profit over the period from new idea generation to the deletion of product from product range.

### Importance of Product Life Cycle Costing

#### **(a) Time based Analysis:**

Life cycle costing involves tracing of costs and revenues of each product over several calendar periods throughout their life cycle. Costs and revenues can be analysed by time periods. The total magnitude of costs for each individual product can be reported and compared with product revenues generated in various time periods.

#### **(b) Overall Cost Analysis:**

Production Costs are accounted and recognized by the routine accounting system. However non-production costs like R&D; design; marketing; distribution; customer service etc. are less visible on a product — by — product basis. Product Life Cycle Costing focuses on recognizing both production and non-production costs.

**(c) Pre-production Costs Analysis**

The development period of R&D and design is long and costly. A high percentage of total product costs may be incurred before commercial production begins. Hence; the Company needs accurate information on such costs for deciding whether to continue with the R&D or not.

**(d) Effective Pricing Decisions**

Pricing Decisions; in order to be effective; should include market considerations on one hand and cost considerations on the other. Product Life Cycle Costing and Target Costing help analyze both these considerations and arrive at optimal price decisions.

**(e) Better Decision Making**

Based on a more accurate and realistic assessment of revenues and costs, at least within a particular life cycle stage, better decisions can be taken.

**(f) Long Run Holistic View**

Product Life Cycle Costing can promote long-term rewarding in contrast to short-term profitability rewarding. It provides an overall framework for considering total incremental costs over the entire life span of a product, which in turn facilitates analysis of parts of the whole where cost effectiveness might be improved.

**(g) Life Cycle Budgeting**

Life Cycle Budgeting, i.e., Life Cycle Costing with Target Costing principles, facilitates scope for cost reduction at the design stage itself. Since costs are avoided before they are committed or locked in the Company is benefitted.

**Target Costing**

Target Costing is defined as “a structured approach in determining the cost at which a proposed product with specified functionality and quality must be produced, to generate a desired level of profitability at its anticipated selling price.

**Steps in Target Costing****Step 1: Customer Product Design Specification:**

- (a) The customer requirements as to the functionality and quality of the product is of prime importance
- (b) The design specification of the new product is based on customer's tastes, expectations and requirements.
- (c) Competitor's products and the need to have extra features over competitor's products are also considered. However the need to provide improved products, without significant increase in prices, should be recognized as charging a higher price may not be possible in competitive conditions.

**Step 2 and Step 3: Market - Target Selling Price and Production Volume:**

- (a) The Target Selling Price is determined using various sales forecasting techniques.
- (b) The price is also influenced by the offers of competitors, product utility, prices, volumes and margins.
- (c) In view of competition and elasticity of demand, the Firm has to forecast the price volume relationship with reasonable certainty. Hence the Target Selling Price is market driven and should encompass a realistic reflection of the competitive environment.
- (d) Establishment of Target Production Volumes is closely related to Target Selling price, given the relationship between price and volume.
- (e) Target Volumes are also significant in computation of unit costs particularly Capacity Related Costs and Fixed Costs. Product Costs are dependent upon the production levels over the life cycle of the product.

**Step 4: Profitability - Target Profit Margin:**

- (a) Since profitability is Critical for survival, a Target Profit Margin is established for all new products.
- (b) The Target Profit Margin is derived from the company's long term business plan, objectives and strategies.
- (c) Each product or product line is required to earn atleast the Target Profit Margin.

**Step 5: Setting Target Costs:**

- (a) The difference between the Target Selling Price and Target Profit Margin indicates the "Allowable Cost" for the product.

- (b) Ideally, the Allowable Cost becomes the “Target Cost for the product”. However, the Target Cost may exceed the Allowable Cost, in light of the realities associated with existing capacities and capabilities.

**Step 6: Computing Current Costs:**

- (a) The “Current Costs” for producing the new product should be estimated.
- (b) The estimation of Current Cost is based on existing technologies and components, taking into account the functionalities and quality requirements of the new product.
- (c) Direct Costs are determined by reference to design specifications, materials prices, labour processing time and wage rates. Indirect Costs may be estimated using Activity Based Costing Principles.

**Step 7: Setting Cost Reduction Targets:**

- (a) The difference between Current Cost and Target Cost indicates the required cost reduction.
- (b) This amount may be divided into two constituents namely - (a) Target Cost - Reduction Objective and (b) Strategic Cost - Reduction Challenge.
- (c) The former is viewed as being achievable (yet still a very challenging target) while the latter acknowledges current inherent limitations.
- (d) After analyzing the Cost Reduction Objective, a Product-Level Target Cost is set which is the difference between the current cost and the target cost -reduction objective.

**Step 8: Identifying Cost Reduction Opportunities:**

- (a) After the Product-Level Target Cost is set, a series of analytical activities, commence to translate the cost challenge into reality.
- (b) These activities continue from the design stage until the point when the new product goes into production.
- (c) The total target is broken down into its various components, each component is studied and opportunities for cost reductions are identified.
- (d) These activities are referred to as (a) Value Engineering (VE) and (b) Value Analysis (VA).

**Kaizen Costing**

Kaizen Costing refers to the ongoing continuous improvement program that focuses on the reduction of waste in the production process, thereby

further lowering costs below the initial targets specified during the design phase. It is a Japanese term for a number of cost reduction steps that can be used subsequent to issuing a new product design to the factory floor.

### **Value Analysis**

The Value Analysis (VA) technique was developed after the Second World War in America at General Electric during the late 1940s. Since this time the basic VA approach has evolved and been supplemented with new techniques that have become available and have been integrated with the formal VA process.

### **Value Engineering**

Value Engineering is an effective problem solving technique. Value engineering is essentially a process which uses function analysis, teamwork and creativity to improve value. Value Engineering is not just “good engineering.”

It is not a suggestion program and it is not routine project or plan review. It is not typical cost reduction in that it doesn't “cheapen” the product or service, nor does it “cut corners.”

### **Throughput Costing**

Throughput Accounting is a management accounting technique used as a performance measure in the theory of constraints. It is the business intelligence used for maximizing profits. It focuses importance on generating more throughput. It seeks to increase the velocity or speed of production of products and services keeping in view of constraints. It is based on the concept that a company must determine its overriding goal and then it should create a system that clearly defines the main capacity constraint that allows it to maximize that goal.

**Business Process Re-engineering**

Business Process Re-engineering (BPR) refers to the fundamental rethinking and redesign of business processes to achieve improvement in critical measures of performance such as cost, quality, service, speed and customer satisfaction.

**Seven Principles of BPR**

- (a) Processes should be designed to achieve a desired outcome rather than focusing on existing tasks.
- (b) Personnel who use the output from a process should perform the process
- (c) Information processing should be included in the work, which produces the information
- (d) Geographically dispersed resources should be treated, as if they are centralized
- (e) Parallel activities should be linked rather than integrated
- (f) Doers should be allowed to be self-managing
- (g) Information should be captured once at source.

**Back-flush Accounting**

Backflush accounting is when you wait until the manufacture of a product has been completed, and then record all of the related issuances of inventory from stock that were required to create the product. This approach has the advantage of avoiding all manual assignments of costs to products during the various production stages, thereby eliminating a large number of transactions and the associated labour.

**Lean Accounting**

Lean Accounting is the general term used for the changes required to a company's accounting, control, measurement, and management processes to support lean manufacturing and lean thinking. Most companies embarking on lean manufacturing soon find that their accounting processes and management methods are at odds with the lean changes they are making.

**Socio Economic Costing**

Socio economics (also known as social economics) is the social science that studies how economic activity affects and is shaped by social processes. In general it analyzes how societies progress, stagnate, or regress because of their local or regional economy, or the global economy.

Socio economics is sometimes used as an umbrella term with different usages. The term 'social economics' may refer broadly to the "use of economics in the study of society.

**SHORT NOTES**

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**2011 - June [4]** Write short note on the following :

(a) Lean Organization

**(5 marks)**

**Answer :**

**Lean Organization**

- For years together manufacturers have created products in anticipation of having a market for them.
- Operations have traditionally been driven by sales forecasts and firms tended to stockpile inventories in case they were needed.
- A key difference in Lean Manufacturing is that it is based on the concept that production can and should be driven by real customer demand.
- Instead of producing what you hope to sell; Lean Manufacturing can produce what your customer wants with shorter lead times. Instead of pushing product to market, it's pulled there through a system that's set up to quickly respond to customer demand.
- Lean organizations are capable of producing high-quality products economically in lower volumes and bringing them to market faster than mass producers.
- A lean organization can make twice as much product with twice the quality and half the time and space. At half the cost, with a fraction of the normal work-in-progress inventory.



- Lean management is about operating the most efficient and effective organization possible, with the least cost and zero waste.

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**2011 - Dec [4]** Write short note on the following:

(b) Kaizen Costing

**(5 marks)**

**Answer:**

- Kaizen is a Japanese term meaning “change for the better”. The concept of Kaizen encompasses a wide range of ideas; it involves making the work environment more efficient and effective by creating a team atmosphere, improving everyday procedures, ensuring employee satisfaction and making a job more fulfilling, less tiring and safer.
- A method of costing that involves making continual, incremental improvements to the production process during the manufacturing phase of the product/service lifecycle, typically involving setting targets for cost reduction. Some of the key objectives of the Kaizen philosophy include the elimination of waste, quality control, just-in-time delivery, standardized work and the use of efficient equipment.

*An example of the Kaizen philosophy in action is the Toyota production system, in which suggestions for improvement are encouraged and rewarded, and the production line is stopped when a malfunction occurs.*

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**2013 - June [4]** Write short note on the following:

(a) Lean Accounting

**(5 marks)**

**Answer:**

**Lean Accounting**

- It refers to the application of lean principles in day to day accounting process by eliminating 3Ms (muda-waste, mura-variation, and mura-strain on resources) by looking at it from eyes of the customer/user/beneficiary group.
- Lean accounting highlights the importance of the lean performance measurements and reporting in the general accounting for lean application process.

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- There are basically three aspects to measure lean performance as given under:
  - (i) Development of strategy which supports, company level measurement,
  - (ii) Continuous improvement through value stream level measurements, and
  - (iii) Process and cell design measurements driving the mudiari Process.

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**2014 - Dec [8]** Write Short Notes on the following:

- (b) Areas of Cost Reduction and techniques to be adopted for Cost Reductions
- (c) Need for 'Lean Accounting'
- (d) Kaizen Costing

**(5 marks each)**

**Answer:**

**(b) Areas of Cost Reduction and Techniques to be adopted for Cost Reductions:**

**Areas of Cost Reduction:**

- (1) Reduce payroll costs by outsourcing activities.
- (2) Redesign processes to eliminate duplication of effort and time.
- (3) Make more use of technology and automation.
- (4) Consolidate purchasing with fewer suppliers to get better discounts and build strong relationships.
- (5) Agree to long-term supply contracts or annual purchase volumes in return for lower prices and negotiate longer payment terms.
- (6) Trim back your product range and increase production runs.
- (7) Get the most out of your premises by sub-letting spare space.
- (8) Cut the cost of communications and travel by using email, internet calls (such as Skype) or teleconferencing whenever possible.

**Cost Reduction Techniques**

- (1) **Standardization:** According to Kimball and Kimball , “By standardization in the manufacturing scene meant the reduction of any one line to fixed types, sizes and characteristics.” In simple words standardization is the process of formulating and applying rules for an orderly approach to specific activity.
- (2) **Codification:** It is a process of representing each item by a number, the digit of which indicates the group, the type and the dimension of item.
- (3) **Value Analysis:** Value analysis is defined as an organized creative approach which has, as its objective, the efficient identification of unnecessary cost.

**Answer:****(c) Need for Lean Accounting:**

- Lean Accounting provides accurate, timely and understandable information that can be used by managers, sales people, operations leaders, accountants, lean improvement teams and other policy makers.
- The information gives clear insight into the company's performance: both operational and financial.
- It measures the right things for a company that wants to drive forward with lean transformation.
- The Lean accounting reporting motivates people in the organization to move lean improvement forward. It is often stated that-what you measure is what will be improved.
- Lean Accounting is also itself lean.
- The information, reports and measurements can be provided quickly and easily.
- It does not require the complex systems and wasteful transactions that are usually used by manufacturing Companies.
- The simplicity of lean Accounting frees up the time of the financial people and the operational people so that they can become more actively involved in moving the Company forward towards its strategic goals.
- The role of the financial professional moves away from book keeper and reporter and towards strategic partnering with the Company leaders.

**Answer:**

**(d) Kaizen Costing: Please refer 2011 - Dec [4] (b) on page no. 19**

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**2015 - June [4] (a) (ii) Write a note on “Kaizen Costing”. (7 marks)**

**Answer:**

**Please refer 2011 - Dec [4] (b) on page no. 19**

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**2017 - June [8] Write a short note on the following:**

(a) Variants of Backflush Accounting.

**(4 marks)**

**Answer:**

There are a number of variants of the Back flush system, each differing as to the 'trigger points' at which costs are recognized within the cost accounts and thus, associated with products.

**Variante-1:** This has two trigger points (TP): TP 1 - purchase of raw materials/components. A 'raw and in process (RIP)' account will be debited with the actual cost of materials purchased, and creditors credited. TP 2 - completion of good units. The finished goods (FG) account will be debited with the standard cost of unit produced and the RIP and CC account will be credited with the standard cost.

**Variante-2:** This has only one trigger points - the completion of good units. The FG account is debited with the standard cost of units produced, with corresponding credits to the CC account and the creditors account.

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**2017 - Dec [8] Write short notes on the following:**

(b) Seven Principles of BPR

(d) Lean Accounting

(e) Value Engineering

**(4×3 = 12 marks)**

**Answer:**

**(b) Seven Principles of BPR:** 1. Processes should be designed to achieve a desired outcome rather than focusing on existing tasks, 2. Personnel who use the output from a process should perform the process, 3. Information processing should be included in the work, which produces the information, 4. Geographically dispersed resources should be treated, as if they are centralized, 5. Parallel

activities should be linked rather than integrated, 6. Doers should be allowed to be self-managing, 7. Information should be captured once at source.

**(d) Lean Accounting: Please refer 2013 - June [4] (a) on page no.19**

**(e) Value Engineering:** Value engineering is an organized / systematic approach directed at analyzing the function of systems, equipment, facilities, services, and supplies for the purpose of achieving their essential functions at the lowest life-cycle cost consistent with required performance reliability, quality and safety.

**Society of Japanese Value Engineering defines VE as:**

“A systematic approach to analyzing functional requirements of products or services for the purposes of achieving the essential functions at the lowest total cost”.

Value Engineering is an effective problem solving technique. Value Engineering is essentially a process which uses function analysis, team-work and creativity to improve value. Value Engineering is not just “good engineering”. It is not a suggestion program and it is not routine project or plan review. It is not typical cost reduction in that it doesn’t “cheaper” the product or service, nor does it “cut corners”.

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**2018 - June [8]** Write short notes on the following:

- (a) Backflush Accounting
- (d) Value Engineering
- (e) Life Cycle Costing

**(4 × 3 = 12 marks)**

**Answer:**

**(a)** Backflush accounting is when you wait until the manufacture of a product has been completed, and then record all of the related issuances of **inventory** from stock that were required to create the product. This approach has the advantage of avoiding all manual assignments of **costs** to products during the various production stages, thereby eliminating a large number of transactions and the associated clerical labour.

Backflush accounting is entirely automated, with a computer handling all transactions. The backflushing formula is:

Number of units produced × unit count listed in the **bill of materials** for each component = Number of **raw material** units removed from stock

Backflushing is not suitable for long production processes, since it takes too long for the inventory records to be reduced after the eventual completion of products. It is also not suitable for the production of customized products, since this would require the creation of a unique bill of materials for each item produced.

- (d) Value engineering is a function oriented, systematic team approach and study to provide value in a product, system or service. Often, this improvement is focused on cost reduction; however other important areas such as customer perceived quality and performance are also of paramount importance in the value equation.

Value engineering techniques can be applied to any product, process, procedure, system, or service in any kind of business or economic activity including health care, governance, construction, industry and in the service sector.

Value engineering focuses on those value characteristics which are deemed most important from the customer point of view.

Value engineering is a powerful methodology for solving problems and /or reducing costs while maintaining or improving performance and quality requirements.

Value engineering can achieve impressive savings, much greater than what is possible through conventional cost reduction exercise even when cost reduction is the objective of the task.

- (e) Life cycle costing is a system that tracks and accumulates the actual costs and revenues attributable to cost object from its invention to its abandonment. Life cycle costing involves tracing cost and revenues on a product by product base over several calendar periods. The total cost throughout its life including planning, design, acquisition and support costs and any other costs directly attributable to owning or using the asset”.

Life Cycle Cost (LCC) of an item represents the total cost of its ownership, and includes all the costs that will be incurred during the life of the item to acquire it, operate it, support it and finally dispose it. Life Cycle Costing adds all the costs over their life period and enables an evaluation on a common basis for the specified period (usually discounted costs are used). This enables decisions on acquisition, maintenance, refurbishment or disposal to be made in the light of full cost implications. In essence, Life Cycle Costing is a means of estimating all the costs involved in procuring, operating, maintaining and ultimately disposing a product throughout its life.

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**2018 - Dec [8]** Write short notes on the following:

- (a) Business Process Re-engineering
- (c) Features of Target Costing **(4 × 2 = 8 marks)**

**Answer:**

- (a) Business Process Re-engineering (BPR) refers to fundamental rethinking and redesign of business processes to achieve improvement in critical measures of performance such as cost, quality, service, speed and customer satisfaction.  
In contrast, the meaning of Kaizen, which involves small, incremental steps towards gradual improvement, re-engineering involves a giant leap.  
It is the complete redesign of a process with an emphasis on finding creative new way to accomplish an objective.  
It has been described as taking a blank piece of paper and starting from scratch to redesign a business process. Rather than searching continually for minute improvement, re-engineering involves a radical shift in thinking about how an objective should be met.  
Re-engineering prescribes radical, quick and significant change.  
Admittedly, it can entail high risks, but it can also bring big rewards.  
These benefits are most dramatic, when new models are discovered for conducting business.
- (c) Target Costing is defined as “a structured approach in determining the cost at which a proposed product with specified functionality and quality must be produced, to generate a desired level of profitability at its anticipated selling price.”

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**The important features or practices followed in Target Costing are:**

|                 |   |
|-----------------|---|
| <b>Step 1:</b>  | Identify the market requirements as regards design, utility and need for a new product or improvements of existing product.   |
| <b>Step 2:</b>  | Set Target Selling Price based on customer expectations and sales forecasts.  |
| <b>Step 3:</b>  | Set Target Production Volumes based on relationships between price and volume.  |
| <b>Step 4:</b>  | Establish Target Profit Margin for each product, based on the company's long term profit objectives, projected volumes, and course of action, etc.  |
| <b>Step 5:</b>  | Set Target Cost (or Allowable cost) per unit, for each product.<br>Target cost = Target selling price less Target profit margin   |
| <b>Step 6:</b>  | Determine Current Cost of producing the new product, based on available resources and conditions.   |
| <b>Step 7:</b>  | Set cost reduction Target in order to reduce the Current Cost to the Target Cost.   |
| <b>Step 8:</b>  | Analyze the Cost Reduction Target into various components and identify cost reduction opportunities using Value Engineering (VE) and Value Analysis (VA) and Activity Based Costing (ABC) |
| <b>Step 9:</b>  | Achieve cost reduction and Target profit by Effective Implementation of Cost Reduction decisions  |
| <b>Step 10:</b> | Focus on further possibilities of cost reduction i.e. Continuous Improvement program.   |

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**2019 - June [8]** Write short notes of the following:

(b) Lean Accounting



(d) Product Life Cycle Costing (4 marks each)

**Answer:**

(b) **Lean Accounting:** *Please refer 2013 - June [4] (a) on page no. 19*

(d) **Product Life Cycle Costing is considered important due to the following reasons**

- (i) **Time based analysis:** Life cycle costing involves tracing of costs and revenues of each product over several calendar periods throughout their life cycle. Costs and revenues can be analysed by time periods. The total magnitude of costs for each individual product can be reported and compared with product revenues generated in various time periods.
- (ii) **Overall Cost Analysis:** Production Costs are accounted and recognized by the routine accounting system. However non-production costs like R&D; design; marketing; distribution; customer service etc. are less visible on a product by product basis. Product Life Cycle Costing focuses on recognizing both production and non-production costs.
- (iii) **Pre-production costs analysis:** The development period of R&D and design is long and costly. A high percentage of total product costs may be incurred before commercial production begins. Hence; the Company needs accurate information on such costs for deciding whether to continue with the R&D or not.
- (iv) **Better Decision Making:** Based on a more accurate and realistic assessment of revenues and costs, at least within a particular life cycle stage, better decisions can be taken.
- (v) **Long Run Holistic view:** Product Life Cycle Costing can promote long-term rewarding in contrast to short-term profitability rewarding. It provides an overall framework for considering total incremental costs over the entire life span of a product, which in turn facilitates analysis of parts of the whole where cost effectiveness might be improved.

(vi) **Life Cycle Budgeting:** Life Cycle Budgeting, i.e., Life Cycle Costing with Target Costing principles, facilitates scope for cost reduction at the design stage itself. Since costs are avoided before they are committed or locked in the Company is benefited.

(vii) **Review:** Life Cycle Costing provides scope for analysis of long term picture of product line profitability, feedback on the effectiveness of life cycle planning and cost data to clarify the economic impact of alternatives chosen in the design, engineering phase etc.

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**2019 - Dec [8]** Write short note on the following:

(c) Target costing

**(4 marks)**

## DISTINGUISH BETWEEN

**2015 - June [4]** (b) (ii) Distinguish between Cost Reduction and Cost Control. **(7 marks)**

**Answer:**

**Difference between Cost Reduction and Cost Control:**

| Particulars           | Cost Reduction  | Cost Control  |
|-----------------------|---|---|
| 1. Permanence         | Permanent, Real and reflects genuine savings in cost.   | Represents efforts made towards achievement of pre-determined target or goal.     |
| 2. Nature of function | It is a corrective function. It can operate along with an efficient cost control system. This concept Believes that there is always a scope for further reduction in costs. | It is a preventive function, where costs are optimized before these are incurred. |

|                           |  |   |
|---------------------------|--|---|
| 3. Nature of process      | It presumes the existence of concerned potential savings in norms or standards and therefore it is a corrective process.   | It does not focus on costs independent of revenue nor considers product attributes as given. It is a holistic control process.      |
| 4. Performance evaluation | It is not concerned with maintenance of performance according to standards.  | The process involves setting up a target, investigating variances and taking remedial measures to correct them.                     |
| 5. Nature of Standards    | Continuous process of critical examination includes analysis and challenge of standards. It assumes the existence of potential savings in the standards and aims at improving them by bringing out more savings. | It accepts the standards, once they have been fixed. In other words, standards shall remain, as it is.                              |
| 6. Dynamism               | Fully a dynamic approach.  | It is a routine exercise and lacks dynamic approach.  |
| 7. Coverage               | Universally applicable to all areas of business. Does not depend upon standards, though target amounts may be set.   | Limited applicability to those items of cost for which standards can be set.  |
| 8. Basic approach         | It is not concerned with maintenance of performance according to standards. It challenges the very standards set.  | It involves setting up a target, ascertaining the actual performance and doing the variance analysis, followed by remedial actions. |

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2018 - Dec [8] (d) Differences between Standard Costing and Kaizen Costing. (4 marks)

Answer:

| Basis of difference | Standard Costing   | Kaizen Costing  |
|---------------------|--|---|
| 1. Concepts         | It is used for cost control  | It is used for cost reduction.  |
|                     | It is assumed that current manufacturing conditions remain unchanged.            | It assumes continuous improvement.  |
|                     | The cost focus is on standard costs based on static conditions                   | The cost focus is on actual costs assuming dynamic conditions   |
|                     | The aim is to meet cost performance standards                                    | The aim is to achieve cost reduction targets.   |
| 2. Techniques       | Standards are set every six or twelve months                                     | Cost reduction targets are set and applied monthly  |
|                     | Costs are controlled using variance analysis based on standard and actual costs. | Costs are reduced by implementing continuous improvement (kaizen) to attain the target profit or to reduce the gap between target and estimated profit. |
|                     | Management should investigate and respond when standards are not met.            | Management should investigate and respond when target kaizen amount are not attained.   |
| 3. Employees        | They are often viewed as the cause of problems                                   | They are viewed as the source of, and are empowered to find, the solutions.   |

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## DESCRIPTIVE QUESTIONS

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**2009 - June [1] {C}** (c) Define the following terms (in not more than two sentences):

(v) Value Engineering. **(2 marks)**

**Answer :**

Value Engineering is a function oriented, systematic team approach and study to provide value in a product, system or service. Often, this improvement is focused on cost reduction; however other important areas such as customer perceived quality and performance are also of paramount importance in the value equation.

— Space to write important points for revision —

**2012 - June [4]** Answer the following in brief:

What do you understand by the term “Life Cycle Cost”? **(5 marks)**

**Answer:**

- It focuses on total cost (**Capital cost + revenue cost**) over the products life including design. **CIMA** defines life cycle costing as the practice of obtaining over life time, the best use of physical asset at the lowest cost of entity.
- “The term “**Life Cycle Cost**” has been defined as follows, “It includes the cost associated with acquiring, using, caring for and disposing of physical asset including the feasibility studies, research, design, development, Production, maintenance, replacement and disposal as well as support, training and operating cost, generated by the acquisition use, maintenance and replacement of permanent physical assets.”
  1. Life cycle costing estimates and accumulates costs over a product’s entire life cycle.
  2. The objective is to determine whether costs incurred at different stages of development, (planning, designing and testing) manufacturing (conversion activities) and marketing (advertising

distribution, warranty) of the product will be recovered by revenue to be generated by the product over its life cycle.

3. Life cycle costing provides an insight, useful for understanding and managing costs over the life cycle of the product.
4. In particular it helps to evaluate the viability of the product, decides on pricing of the product at different stage of product life cycle and often helps to estimate the value of the product to its user.
5. When used in conjunction with target costing, life cycle costing becomes an important tool for cost management.
6. Life cycle costing estimates and accumulates costs over a product's entire life cycle in order to determine whether the profits earned during the manufacturing phase will cover the costs incurred during the pre-and post manufacturing stages.
7. Identifying the costs incurred during the different stages of product's life cycle provides an insight into understanding and managing the costs incurred throughout its life cycle. In particular, Life cycle costing helps management to understand the cost consequences of developing and making a product and to identify areas in which cost reduction efforts are likely to be most effective.
8. Most accounting system report on a period-by-period basis, and products are not monitored over their life cycles. In contrast product life cycle reporting involves tracing costs and revenue on a product-by-product basis over several calendar periods throughout their life cycle.
9. A Typical pattern of cost commitment and cost incurrence during the three stages of a product's life cycle-the planning and design stage, the manufacturing stage and the service and abandonment stage.
10. Committed or locked in cost that have not been incurred but that will be incurred in the future on the basis of decisions that have already been made. Costs are incurred when resource is used or sacrificed.
11. Costing system record costs-only when they been incurred. It is difficult to significantly alter costs after they have been committed. For example the product design specifications determine a product's material and labour inputs and the

production process. At this stage costs become committed and broadly determine the future costs that will be incurred at the manufacturing stage.

12. That approximately 80% of a product's costs are committed during the planning and design stage. At this stage product designers determine the product's design and the production process. In contrast the majority of costs are incurred at the manufacturing stage, but they have already become locked in at the planning and design stage and are difficult to alter.

— Space to write important points for revision —

**2013 - Dec [7] (b) Why 'Lean Accounting' is needed? (2 marks)**

**Answer :**

'**Lean Accounting**' provides accurate, timely and understandable information that can be used by managers, sales people, operations leaders, accountants, lean improvement teams and other policy makers. The information gives clear insight into the company's performance: both operational and financial. It measures the right things for a company that wants to drive forward with lean transformation.

— Space to write important points for revision —

**2014 - June [7] (a) What is meant by Business Process Re-engineering (BPR)? How can BPR be applied to an organisation? Give an example of BPR application. (2 + 6 + 2 = 10 marks)**

**Answer:**

**Business Process Re-engineering:** is a business management strategy, originally pioneered in the early 1990s, focusing on the analysis and design of workflows and processes within an organization. BPR is aimed to help organizations fundamentally rethink how they do their work in order to dramatically improve customer service, cut operational costs, and become world-class competitors. In the mid-1990s, as many as 60% of the Fortune 500 companies claimed to either have initiated re-engineering efforts, or to have plans to do so.

BPR seeks to help companies radically restructure their organizations by focusing on the ground-up design of their business processes. According to Davenport (1990) a business process is a set of logically related tasks performed to achieve a defined business outcome. Re-engineering emphasized a holistic focus on business objectives and how processes

related to them, encouraging full-scale recreation of processes rather than iterative optimization of sub-processes.

### **An Example of BPR Application**

For example, if a bank customer enters into the bank determined to apply for a loan, apply for an ATM card and open a savings account, most probably must visit three different desks in order to be serviced. When BPR is applied to an organization the customer communicates with only one person, called “case manager”, for all three inquiries.

The implementation of “One Stop Shopping” as a major customer service innovation, requires the close coordination with a team of staff assigned to a process powered by IT for exchanging information and documents in order to service the customer’s request.

For instance a customer applying for a loan “triggers” a team of staff assigned to service a loan application. The manager completes an application for a loan in electronic form, which in turn is submitted through the network to the next team member, the credit control director, who examines the credit status of the customer. If the credit status is not satisfactory the rejection of the loan is approved by the credit manager and a rejection form is filled and it is returned to the case manager. The case manager explains to the customer the reason that his application was rejected.

### **How can BPR be applied to an organization**

|   |                              |  |
|---|------------------------------|--|
| 1 | <b>Empowering People</b>     | Empowerment means giving people the ability to do their work: the right information, the right tools, the right training, the right environment and the authority they need. Information systems help empower people by providing information, tools and training. |
| 2 | <b>Providing Information</b> | Providing information to help people perform their work is a primary purpose of most information systems although they provide information in many different ways.   |
| 3 | <b>Providing Tools</b>       | In addition to providing the right information, empowering people means giving them the right tools.   |



|   |   |  |
|---|---|--|
| 4 | <b>Providing<br/>Training</b>   | Since information systems are designed to provide the information needed to support desired work practices, they are often used for training and learning. As shown by an expert system and a decision simulator, they sometimes provide new and unique training methods.                    |
| 5 | <b>Eliminating<br/>Unproductive<br/>Uses of Time</b>                                    | Information systems can reduce the amount of time people waste doing unproductive work.  |
| 6 | <b>Eliminating<br/>Unnecessary<br/>Paper</b>  | One common way to improve data processing is to eliminate unnecessary paper. Although paper is familiar and convenient for many purposes, it has major disadvantages. It is bulky, difficult to move from place to place and extremely difficult to use for analysing large amounts of data. |
| 7 | <b>Eliminating<br/>Unnecessary<br/>Variations in the<br/>Procedures and<br/>Systems</b> | In many companies, separate departments use different systems and procedures to perform essentially similar repetitive processes, such as paying employees, purchasing supplies and keeping track of inventories.  |
| 8 | <b>Minimizing the<br/>Burden of<br/>Record Keeping</b>                                  | Data Handling and General Office Work. Since processing data is included in most jobs, improving the way people process data is an obvious place to look for information system applications.  |

— Space to write important points for revision —

**2015 - Dec [10]** (a) What are the criteria to be maintained by the companies which want to get maximum benefit from 'target costing'?

**(4 marks)**

**Answer:**

**The following criteria are to be maintained by the companies who want to get maximum benefit from 'target costing':**

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- (i) Assembly-oriented industries, as opposed to repetitive-process industries that produce homogeneous products.
- (ii) Industries involved heavily with the diversification of the product lines.
- (iii) Used technologies of factory automation, including computer-aided design, flexible manufacturing systems, office automation, computer-aided manufacturing etc.
- (iv) Have experienced shorter product life cycles where the pay-back for factory automation typically must be achieved in short-term period (less than eight years).
- (v) Must develop the system for reducing costs during the planning, design and development stages of a PLC.
- (vi) Able for implementing management methods, such as Just-in-time. Value engineering and Total Quality Control.

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**2016 - June [7]** (b) Define the term 'value engineering'. **(2 marks)**

**Answer:**

***Please refer 2009 - June [1] {C} (v) on page no. 31***

— Space to write important points for revision —

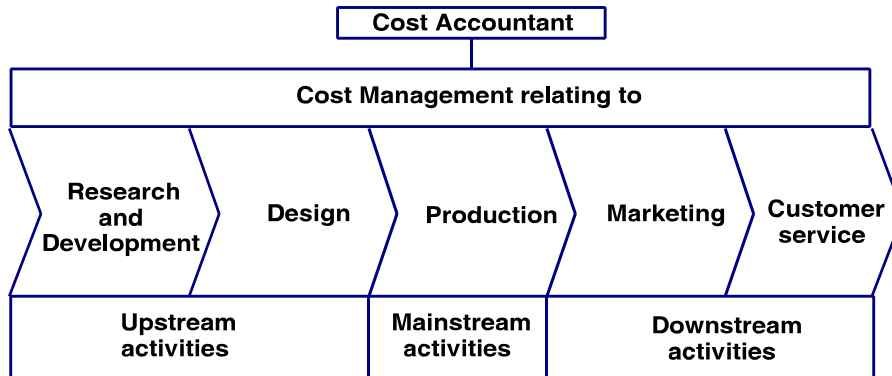
**2017 - June [2]** (a) What is Value Chain ? How does it help modern cost management? **(2+4 = 6 marks)**

**Answer:**

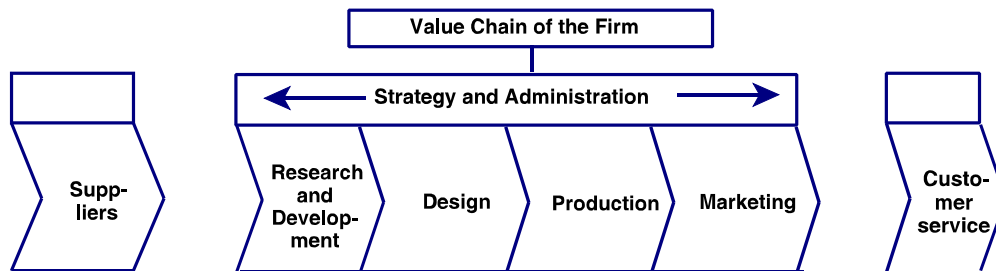
A value chain is the sequence of business functions in which utility (usefulness) is added to the products or services of the firm. Through proper analysis and management of each segment of the value chain, customer value is enhanced. Non-value creating activities are eliminated.

In value chain analysis, each of the business functions is treated as an essential and valued contributor and is constantly analyzed to enhance value relative to the cost incurred. Like business functions, in value chain approach also, it is important that the efforts of all functions are integrated and co-ordinated to increase the value of the products or services to the customers.

The following diagram shows the important functions or activities of a firm and the role of the cost accountant in cost management.



Michael Porter introduced the value chain concept in cost management in 1985. It was developed further by Ahw subsequently. When the supplier and customers are included, the firm is viewed as an extended value chain as shown below:



The value chain approach is an integral part of strategic cost management, which is an approach to Management Accounting that explicitly highlights strategic issues and concerns. It sets cost analysis as a broader context in which cost information is used to develop superior strategies.

Modern cost accountant has an important role to play in analyzing cost information relating to each of the segments of the value chain and supplying the same to other functional managers for improved decisions.

— Space to write important points for revision —

**2017 - June [2]** (b) (i) What are the problems of Traditional Costing arising out of volume-based cost allocation to products? **(1 mark)**

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**Answer:**

Under traditional costing, overhead which occupies an important share of the total cost structure of the firm is generally allocated based on volume-based allocation rates viz. rates per labour hour, rate per machine hour, % of labour cost, etc. It does not take into consideration disproportionate consumption of service from service department. As a result, the product cost gets distorted i.e., some products are over costed while others are under costed. The basic assumption in cost allocation is; the higher the volume, the greater the share of indirect costs to the product or service. This simplistic assumption does not hold good in reality.

— Space to write important points for revision —

**2018 - June [2]** (b) What is Target Cost? How would you determine it?

**(2 + 2 = 4 marks)**

**Answer:**

The target cost of a product is the expected selling price of the product minus the desired profit from selling it. In other words, target cost is really a measure of how low costs need to be to make a certain profit.

**Target costing** is an approach to determine a product's **life-cycle cost** which should be sufficient to develop specified functionality and quality, while ensuring its desired **profit**. It involves setting a target cost by subtracting a desired **profit margin** from a competitive market price. A target cost is the maximum amount of cost that can be incurred on a product, however, the firm can still earn the required profit margin from that product at a particular selling price.

**How to determine target cost:** The market requirement is identified regarding design, utility, need for the product. Target selling price is determined based on customer expectation and sales forecast. Target production volume is set based on price volume relationship. Target profit margin is established based on the company's long term profit objectives, projected volumes, course of action, etc.

The target cost or allowable cost is determined as the target selling price minus the target profit margin.

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**PRACTICAL QUESTIONS**

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**2015 - June [4]** (a) (i) Aadarsh Instruments, located in Ambala, is a medical instrument manufacturing company considered to apply Value Engineering in to the Focus Adjustment Knob in one of their model SL 250 for Slit Lamp in microscope. This microscope has found application in the field of eye inspection. The value engineering analysis may help company in running its export business of medical microscope. This firm is producing different types of microscopes which they export to various countries around the globe. All of the products manufactured here are conforming to the international standards. It is an ISO certified company. The total savings after the implementation of value engineering are as given below:

- Cost before analysis — ₹ 29.99
- Total Cost of Nylon Knob — ₹ 18.40
- Saving per product — ₹ 11.59
- Percentage saving per product — ₹ 38.64%
- Annual Demand of the product — 8,000
- Total Annual Saving — ₹ 92,720
- Value Improvement — ₹ 62.98%

What are the steps to be followed for doing Value Engineering? How can you conclude the decision on the basis of the above Value Engineering?

**(8 marks)**

**Answer:**

The following are the steps to be used for carrying out the Value Engineering exercise by Aadarsh Instruments in their model SL 250 for Slit Lamp in Microscope for the Focus Adjustment Knob:

- (i) Selection of the Product Plan.
- (ii) Gathering Product Information
- (iii) Functional Analysis
- (iv) Creativity Phase and preparing the work-sheet
- (v) Evaluation Sheet
- (vi) Cost Analysis
- (vii) Result and Conclusion
- (viii) Implementation.

**Conclusion:**

Value Engineering methodology is a powerful tool for resolving system failures and designing improvements in performance of any process, product, service or organization. In the Case Study discussed under the question, we have used the concept of Value Engineering to analyze the Focus Adjustment Knob of SL 250 Slit Lamp Microscope. With a critical evaluation of this study, we have been able to increase the value of the product by substituting another material in place of the one currently in use. The % value improvement is to the tune of 62.98% and the total annual saving has been ₹ 92,720.

The various advantages have been observed in terms of:

- Cost Reduction
- Increase in overall production
- Reduction in man-power
- Reduction in scrap.

Thus the cost has been brought down by a substantial margin and thereby the value of the product has been increased.

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**2016 - June [5] {C}** (b) The public sector Bank of India (BOI), which targets to take its business to about ₹ 12 lakhs crore in next five years, mulls to implement Business Process Re-engineering (BPR) initiates to streamline its growing business. Seven consultants, including Ernst & Young, Boston Consulting Group (BCG) and McKinsey, have expressed interest to take up the job of evaluation and restructuring the organizational set-up by using 3Rs Model of BPR. What are the actions and resources to be considered for 3Rs Model of BPR for expecting the results to BOI? **(6 marks)**

**Answer:**

BPR is achieving dramatic performance improvements through radical changes in organizational process, re-architecting of business and management process. It involves the redrawing of organizational boundaries, the reconsideration of jobs, tasks, knowledge and skills. This occurs with the creation and the use of models. In resuming the whole process of BPR in order to achieve the expected results is based on key steps- principles which include 3R (i.e., re-design, re-tool and re-orchestrate). Each step-principle embodies the actions and resources as presented in below:

| Re-design     | Re-tools  | Re-orchestrate         |
|---------------|-----------|------------------------|
| Simplify      | Networks  | Synchronies            |
| Standardize   | Intranets | Processes              |
| Empowering    | Extranets | Information Technology |
| Employee-ship | Workflow  | Human resources        |
| Groupware     |           |                        |
| Measurements  |           |                        |

— Space to write important points for revision —

**2017 - June [3]** (b) A2Z p.l.c. supports the concept of zero technology or life cycle costing for new investment decisions covering its engineering activities. The financial side of this philosophy is now well established and its principles extended to all other areas of decision making. The company is to replace a number of its machines and the Production Manager is torn between the Exe Machine, a more expensive machine with a life of 12 years, and the Wye machine with an estimated life of 6 years. If the Wye machine is chosen, it is likely that it would be replaced at the end of 6 years by another Wye machine. The pattern of maintenance and running costs differs between the two types of machine and relevant data are shown below:

|  | Exe                    | Wye                 |
|--|------------------------|---------------------|
| Purchase price                                       | ₹ 19,000               | ₹ 13,000            |
| Trade-in value/breakup/scrap                         | ₹ 3,000                | ₹ 3,000             |
| Annual repair costs                                  | ₹ 2,000                | ₹ 2,600             |
| Overhaul costs                                       | (at year 8) ₹<br>4,000 | (at year 4) ₹ 2,000 |
| Estimated financing costs averaged over machine life | 10% p.a.               | 10% p.a.            |

*Required* : Recommend with supporting figures, which machine to purchase, stating any assumptions made? **(8 marks)**

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**Answer:****Profitability of Alternate Machines**

|  |              | Exe Machine |              | WYE Machine |
|--|--------------|-------------|--------------|-------------|
| Initial cost (₹)                       |              | 19,000      |              | 13,000.00   |
| Less: Scrap at the end of the life (₹) | (3,000x0.32) | 960.00      | (3,000x0.56) | 1,680.00    |
|  |              | 18,040.00   |              | 11,320.00   |
| Present value of total annual cost (₹) | (2,000x6.81) | 13,620.00   | (2,600x4.36) | 11,336.00   |
| Overhaul Cost                          | (4,000x0.47) | 1,880.00    | (2,000x0.68) | 1,360.00    |
|  |              | 33,540.00   |              | 24,016      |
| Capital recovery factor                | (1/6.81)     | 0.15        | (1/4.36)     | 0.23        |
| Equivalent annual cost (₹)             |              | 5,031.00    |              | 5,523.68    |

**Conclusion:**

As the equivalent annual cost is less for Exe Machine, it is better to purchase the same.

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**2017 - June [4]** (a) SRM Ltd. has developed a new product 'Kent' which is about to be launched into the market and anticipates to sell 80,000 of these units at a sale price of ₹ 300 over the product's life cycle of four years. Data pertaining to product 'Kent' are as follows:

|  |                |
|--|----------------|
| Costs of Design and Development of Moulding Dies and Other tools | ₹ 10,25,000    |
| Manufacturing costs  | ₹ 125 per unit |



|                      |   |
|----------------------|---|
| Selling costs        | ₹ 12,500 per year + ₹ 100 per unit  |
| Administration costs | ₹ 50,000 per year   |
| Warranty expenses    | 5 replacement parts per 25 units at ₹ 10 per part, 1 visit per 500 units (cost ₹ 500 per visit) |

**Required :**

- (i) Compute the product Kent's Life Cycle Cost.
- (ii) Suppose SRM Ltd. can increase sales volume by 25% through 15% decrease in selling price, should SRM Ltd. choose the lower price?

**(8 marks)**

**Answer:**

**Statement showing 'Kent's Life Cycle Cost (80,000 Units)**

| Particulars   | Amount (₹)         |
|---|--------------------|
| Costs of Design and Development of Moulds, Dies and other tools | 10,25,000          |
| Manufacturing Costs (₹125 × 80,000 units)                       | 1,00,00,000        |
| Selling Costs (₹100 × 80,000 units + ₹ 12,500 × 4)              | 80,50,000          |
| Administration Costs (₹ 50,000 × 4)                             | 2,00,000           |
| <b>Warranty :</b>   |                    |
| (80,000 units / 25 units × 5 parts × ₹ 10)                      | 1,60,000           |
| (80,000 units / 500 units × 1 visit × ₹ 500)                    | 80,000             |
| <b>Total cost</b>   | <b>1,95,15,000</b> |

**Statement showing 'Kent's Life Cycle Cost (1,00,000 Units)**

| Particulars   | Amount (₹)  |
|---|-------------|
| Costs of Design and Development of Moulds, Dies and other tools | 10,25,000   |
| Manufacturing Costs (₹125 × 1,00,000 units)                     | 1,25,00,000 |

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|   |                 |
|---|-----------------|
| Selling Costs ( $\text{₹}100 \times 1,00,000 \text{ units} + \text{₹} 12,500 \times 4$ )    | 1,00,50,00<br>0 |
| Administration Costs ( $\text{₹} 50,000 \times 4$ )   | 2,00,000        |
| <b>Warranty:</b>  |                 |
| ( $1,00,000 \text{ units} / 25 \text{ units} \times 5 \text{ parts} \times \text{₹}10$ )    | 2,00,000        |
| ( $1,00,000 \text{ units} / 500 \text{ units} \times 1 \text{ visit} \times \text{₹} 500$ ) | 1,00,000        |
| Total cost  | 2,40,75,00<br>0 |

**Statement showing "Kent's Life Time Profit"**

| Particulars      | Amount (₹) 80,000 units                      | Amount (₹) 1,00,000 units                      |
|------------------|--|--|
| Sales            | ( $80,000 \times \text{₹} 300$ ) 2,40,00,000 | ( $1,00,000 \times \text{₹} 255$ ) 2,55,00,000 |
| Less: Total Cost | 1,95,15,000                                  | 2,40,75,000                                    |
| Profit           | 44,85,000                                    | 14,25,000                                      |

**Decision:** Reducing the, price by 15% will decrease profit by ₹ 30,60,000. Therefore, SRM Ltd. should not cut the price.

— Space to write important points for revision —

**2017 - June [4]** (b) BCG Manufacturers sell their product at ₹ 1,000 per unit. Their competitors are likely to reduce the price by 15%. BCG Manufacturers want to respond aggressively by cutting price by 20% and expect that the present volume of 150000 units per annum will increase to 200000 units. BCGM want to earn a 10% target profit on sales. Based on a detailed value engineering, the comparative position is given below:

| Particulars                     | Existing (₹) | Target (₹) |
|---------------------------------|--------------|------------|
| Direct Material Cost per unit   | 400          | 385        |
| Direct Labour Cost per unit     | 55           | 50         |
| Direct machinery costs per unit | 70           | 60         |

|  |           |           |
|--|-----------|-----------|
| Direct Manufacturing expenses per unit | 525       | 495       |
| Manufacturing Overheads                |           |           |
| No. of orders (₹ 80 per order )        | 22,500    | 21,250    |
| Testing hours (₹ 2 per hour)           | 45,00,000 | 30,00,000 |
| Units reworked (₹ 100 per unit)        | 12,000    | 13,000    |

Manufacturing overheads are allocated using relevant cost drivers. Other operating costs per unit for the expected volume are estimated as follows:

|                                |                     |
|--------------------------------|---------------------|
| Research and Design            | ₹ 50                |
| Marketing and Customer Service | <u>₹ 130</u>        |
|                                | <b><u>₹ 180</u></b> |

*Required:*

- (i) Calculate target costs per unit and target costs for the proposed volume showing break up of different elements.
- (ii) Prepare target product profitability statement. **(4+4 = 8 marks)**

**Answer:**

**Part 1:**

|   |       |
|---|-------|
| Target Selling Price: ₹ 1,000 less 20%    | ₹ 800 |
| Less: Target Profit Margin (10% of ₹ 800) | ₹ 80  |
| Target Cost per unit                      | ₹ 720 |

**The breakup of the target cost per unit of ₹ 720 per unit is as follows:**

|   |       |     |
|---|-------|-----|
| Direct Materials                                  |       | 385 |
| Direct Labour                                     |       | 50  |
| Direct Machinery costs                            |       | 60  |
| Direct Manufacturing costs                        |       | 495 |
| <b>Add: Manufacturing Overheads:</b>              |       |     |
| Ordering and receiving (21,250 × ₹ 80)/2,00,000   | 8.50  |     |
| Testing and Inspection (30,00,000 × ₹ 2)/2,00,000 | 30.00 |     |
| Rework (13,000 × ₹ 100)/2,00,000                  | 6.50  | 45  |
| <b>Other Operating Costs:</b>                     |       |     |
| Research and Design                               | 50    |     |

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|                                |     |     |
|--------------------------------|-----|-----|
| Marketing and Customer Service | 130 | 180 |
| Full Product Costs             |     | 720 |

**Part 2:****Target Product Profitability**

| Particulars                    | Per Unit<br>(₹) | Total for<br>200000 units (₹) |
|--------------------------------|-----------------|-------------------------------|
| 1. Sales                       | 800             | 16,00,00,000                  |
| 2. <b>Cost of Goods Sold:</b>  |                 |                               |
| Direct Materials               | 385             | 7,70,00,000                   |
| Direct Labour                  | 50              | 1,00,00,000                   |
| Direct Manufacturing Costs     | 60              | 1,20,00,000                   |
|                                | 495             | 9,90,00,000                   |
| Manufacturing Overheads        | 45              | 90,00,000                     |
|                                | 540             | 10,80,00,000                  |
| 3. Gross Margin (1-2)          | 260             | 5,20,00,000                   |
| 4. <b>Operating Costs:</b>     |                 |                               |
| Research and Design            | 50              | 1,00,00,000                   |
| Marketing and Customer Service | 130             | 2,60,00,000                   |
|                                | 180             | 3,60,00,000                   |
| 5. Operating Profit (3 - 4)    | 80              | 1,60,00,000                   |

— Space to write important points for revision —

**2017 - Dec [5]** (a) Zip Ltd. manufactures three products. The material cost, selling price and bottleneck resource details per unit are as follows:

| Particulars                             | Product<br>T | Product C | Product S |
|---|--------------|-----------|-----------|
| Selling Price (₹)                       | 66           | 75        | 90        |
| Material and other variable cost<br>(₹) | 24           | 30        | 40        |

|                                    |    |    |    |
|------------------------------------|----|----|----|
| Bottleneck resource time (minutes) | 15 | 15 | 20 |
|------------------------------------|----|----|----|

Budgeted factory costs for the period are ₹ 4,43,200. The bottleneck resource time available is 1,50,240 minutes per period.

Required:

- (i) Company adopted throughput accounting and products are ranked according to 'product return per minute'.  
Select the highest rank product.
- (ii) Calculate throughput accounting ratio and comment on it.

**(3+3 = 6 marks)**

**Answer:**

- (i) Calculation of Rank according to product return per minute:**

(₹)

| Particulars                       | T   | C  | S   |
|-----------------------------------|-----|----|-----|
| Selling price                     | 66  | 75 | 90  |
| Less: Variable Cost               | 24  | 30 | 40  |
| Throughput contribution (a)       | 42  | 45 | 50  |
| Minutes per unit (b)              | 15  | 15 | 20  |
| Contribution per minute (a) ÷ (b) | 2.8 | 3  | 2.5 |
| Ranking                           | II  | I  | III |

- (ii) Calculation of Throughput Accounting ratio:**

| Particulars   | T    | C    | S    |
|---|------|------|------|
| Factory cost per minute (₹ 2,21,600/75,120 minutes) (₹) | 2.95 | 2.95 | 2.95 |
| TA Ratio (Contribution per minute/Cost per minute)      | 0.95 | 1.02 | 0.85 |
| Ranking based on TA ratio                               | II   | I    | III  |

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**Analysis:** Product C yields more contribution compared to average factory contribution per minute, whereas T and S yield less.

— Space to write important points for revision —

**2017 - Dec [6]** (a) Wipro is examining the profitability and pricing policies of its Software Division. The Software Division develops Software Packages for Engineers. It has collected data on three of its more recent packages – (i) ECE Package for Electronics and Communication Engineers, (ii) CE Package for Computer Engineers, and (iii) IE Package for Industrial Engineers.

**Summary details on each package over their two-year cradle to grave product lives are:**

| Package | Selling Price | Number of units sold |        |
|---------|---------------|----------------------|--------|
|         |               | Year 1               | Year 2 |
| ECE     | ₹ 250         | 2,000                | 8,000  |
| CE      | ₹ 300         | 2,000                | 3,000  |
| IE      | ₹ 200         | 5,000                | 3,000  |

Assume that no inventory remains on hand at the end of year 2. Wipro is deciding which product lines to emphasize in its software division. In the past two years, the profitability of this division has been mediocre.

Wipro is particularly concerned with the increase in R & D costs in several of its divisions. An analyst at the Software Division pointed out that for one of its most recent packages (IE), major efforts had been made to reduce R & D costs. Last week, Amit, the Software Division Manager, decides to use Life Cycle Costing in his own division. He collects the following Life Cycle Revenue and Cost information for the packages (in ₹):

| Particulars       | Package ECE |           | Package CE |          | Package IE |          |
|-------------------|-------------|-----------|------------|----------|------------|----------|
|                   | Year 1      | Year 2    | Year 1     | Year 2   | Year 1     | Year 2   |
| Revenues          | 5,00,000    | 20,00,000 | 6,00,000   | 9,00,000 | 10,00,000  | 6,00,000 |
| Costs:            |             |           |            |          |            |          |
| R &D              | 7,00,000    | —         | 4,50,000   | —        | 2,40,000   | —        |
| Design of Product | 1,15,000    | 85,000    | 1,05,000   | 15,000   | 76,000     | 20,000   |
| Manufacturing     | 25,000      | 2,75,000  | 1,10,000   | 1,00,000 | 1,65,000   | 43,000   |

**[Chapter 1] Cost Management ■ 15.39**

|                  |          |          |          |          |          |          |
|------------------|----------|----------|----------|----------|----------|----------|
| Marketing        | 1,60,000 | 3,40,000 | 1,50,000 | 1,20,000 | 2,08,000 | 2,40,000 |
| Distribution     | 15,000   | 60,000   | 24,000   | 36,000   | 60,000   | 36,000   |
| Customer Service | 50,000   | 3,25,000 | 45,000   | 1,05,000 | 2,20,000 | 3,88,000 |

**Required:**

Prepare a Product Life Cycle Income Statement for each Software Package. Which package is most profitable and which is the least profitable? How do the three packages differ in their cost structure (the percentage of total costs in each category)? **(6+2+2 = 10 marks)**

**Answer:**

**Life Cycle Income Statement (in ₹ '000)**

| Particulars        | Package ECE |              |              |             | Package CE |            |              |             | Package IE   |            |              |             |
|--------------------|-------------|--------------|--------------|-------------|------------|------------|--------------|-------------|--------------|------------|--------------|-------------|
|                    | Y1          | Y2           | Total        | %           | Y1         | Y2         | Total        | %           | Y1           | Y2         | Total        | %           |
| <b>Revenues</b>    | <b>500</b>  | <b>2,000</b> | <b>2,500</b> | <b>100%</b> | <b>600</b> | <b>900</b> | <b>1,500</b> | <b>100%</b> | <b>1,000</b> | <b>600</b> | <b>1,600</b> | <b>100%</b> |
| Costs              |             |              |              |             |            |            |              |             |              |            |              |             |
| R & D              | 700         | -            | 700          | 28%         | 450        | -          | 450          | 30%         | 240          | -          | 240          | 15%         |
| Design             | 115         | 85           | 200          | 8%          | 105        | 15         | 120          | 8%          | 76           | 20         | 96           | 6%          |
| Manufacturing      | 25          | 275          | 300          | 12%         | 110        | 100        | 210          | 14%         | 165          | 43         | 208          | 13%         |
| Marketing          | 160         | 340          | 500          | 20%         | 150        | 120        | 270          | 18%         | 208          | 240        | 448          | 28%         |
| Distribution       | 15          | 60           | 75           | 3%          | 24         | 36         | 60           | 4%          | 60           | 36         | 96           | 6%          |
| Cust. Service      | 50          | 325          | 375          | 15%         | 45         | 105        | 150          | 10%         | 220          | 388        | 608          | 38%         |
| <b>Total Costs</b> | <b>1065</b> | <b>1085</b>  | <b>2150</b>  | <b>86%</b>  | <b>884</b> | <b>376</b> | <b>1260</b>  | <b>84%</b>  | <b>969</b>   | <b>727</b> | <b>1696</b>  | <b>106%</b> |
| Profit             |             |              | 350          | 14%         |            |            | 240          | 16%         |              |            | (96)         | -6%         |

**Observation:** Package ECE is most profitable, while package IE is least profitable.

— Space to write important points for revision —

**2018 - Dec [5]** (b) For a machine the financial data are given below:

| Time (Year)           | 0    | 1    | 2    | 3    | 4    |
|-----------------------|------|------|------|------|------|
| Outlay (₹)            | 5000 |      |      |      |      |
| Operating Costs (₹)   |      | 1400 | 1500 | 1600 | 1700 |
| Maintenance (₹)       |      |      | 300  | 400  | 500  |
| Value if Scrapped (₹) |      | 3400 | 2000 | 800  | 600  |

The appropriate interest rate is 12% p.a. and the discount factor is as follows:

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|                  |   |       |       |       |       |
|------------------|---|-------|-------|-------|-------|
| Year             | 0 | 1     | 2     | 3     | 4     |
| 12% Disc. Factor | 1 | 0.893 | 0.797 | 0.712 | 0.636 |

**Required:**Determine the optimal length of replacement cycle. **(4+2=6 marks)****Answer:**

| Year             | 0     | 1     | 2     | 3     | 4     | Present Value | Annuity Factor | Average PV |
|------------------|-------|-------|-------|-------|-------|---------------|----------------|------------|
| 12% Disc. Factor | 1     | 0.893 | 0.797 | 0.712 | 0.636 |               |                |            |
| 1                | -5000 | 2000  |       |       |       | 3214          | 0.893          | 3599       |
| 2                | -5000 | -1400 | 200   |       |       | 6091          | 1.69           | 3604       |
| 3                | -5000 | -1400 | -1800 | -1200 |       | 8539          | 2.402          | 3555       |
| 4                | -5000 | -1400 | -1800 | -2000 | -1600 | 10126         | 3.038          | 3333       |

**Decision:** Better to replace at the end of year 4 as the average present value is the lowest.

— Space to write important points for revision —

**2019 - Dec [3]** (a) Zenith Ltd. manufactures tablet batteries. The company is preparing a product life cycle budget for a new type of battery. Development on the new battery is to start shortly. Estimates for the new battery are as follows:

|  |            |
|--|------------|
| Life cycle units manufactured and sold | 2,00,000   |
| Selling price per battery              | ₹55        |
| Life cycle costs:                      |            |
| R&D and design cost                    | ₹8,00,000  |
| <i>Manufacturing:</i>                  |            |
| Variable cost per battery              | ₹25        |
| Variable cost per batch                | ₹300       |
| Battery per batch                      | 250        |
| Fixed costs                            | ₹12,00,000 |
| <i>Marketing:</i>                      |            |
| Variable cost per battery              | ₹3.50      |



|  |           |
|--|-----------|
| Fixed costs                                  | ₹8,00,000 |
| <i>Distribution:</i>                         |           |
| Variable cost per batch                      | ₹140      |
| Battery per batch                            | 100       |
| Fixed costs                                  | ₹4,60,000 |
| Customer service cost per battery (Variable) | ₹1.70     |

Ignore the time value of money.

*Required:*

- (i) Calculate the budgeted life cycle operating income for the new battery.
- (ii) What percentage of the budget total product life cycle costs will be incurred by the end of the R&D and design stages?
- (iii) Company's market research department estimates that reducing price by ₹2.50 will increase life cycle unit sales by 8%. If unit sale increases by 8%, the company plans to increase manufacturing and distribution batch sizes by 8% as well. Assume that all variable costs per battery, per batch and fixed costs will remain the same. Should the company reduce battery price by ₹2.50? Show your calculations.

**(5 + 2 + 5 = 12 marks)**

| <b>Repeatedly Asked Questions</b> |  |                  |
|-----------------------------------|--|------------------|
| <b>No.</b>                        | <b>Question</b>  | <b>Frequency</b> |
| <b>1</b>                          | Write Short Notes on Kaizen Costing<br>11 - Dec [4] (b), 14 - Dec [8] (d),<br>15 - June [4] (a) (ii)   | 3 Times          |
| <b>2</b>                          | Define the term 'value engineering'.<br>09 - June [1] {C} (v), 16 - June [7] (b),<br>18 - June [8] (d) | 3 Times          |
| <b>3</b>                          | Write Short Notes on Lean Accounting<br>13 - June [4] (a), 17 - June [8] (d),<br>19 - June [8] (b)     | 3 Times          |

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| <b>Table Showing Marks of Compulsory Questions</b> |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>Year</b>  | <b>15<br/>J</b> | <b>15<br/>D</b> | <b>16<br/>J</b> | <b>16<br/>D</b> | <b>17<br/>J</b> | <b>17<br/>D</b> | <b>18<br/>J</b> | <b>18<br/>D</b> | <b>19<br/>J</b> | <b>19<br/>D</b> |
| <b>Practical</b>                                   |                 |                 | 6               |                 |                 |                 |                 |                 |                 |                 |
| <b>Total</b>                                       |                 |                 | 6               |                 |                 |                 |                 |                 |                 |                 |