

Analysis of Past Years Theory Marks

Examination	Theory	Practical	Total	Theory % of Total
2013(N)	37	83	120	30.83
2013(M)	39	81	120	32.50
2012(N)	46	70	116	40.00
2012(M)	28	88	116	24.14
2011(N)	32	83	116	28.00
2011(M)	33	83	116	28.45
2010(N)				
New	38	78	116	32.76
Old	28	88	116	24.14
2010(M)				
New	29	71	100	29.00
Old	27	73	100	27.00
2009(N)				
New	24	76	100	24.00
Old	26	74	100	26.00
2009(M)				
New	29	87	116	25.00
Old	35	81	116	30.17
2008(N)				
New	27	89	116	23.28
Old	38	78	116	32.76
2008(M)	33	86	119	27.73
2007(N)	45	74	119	37.81

In the last examination i.e. 2013(N) all theory questions were asked practical oriented. Now depth and conceptual knowledge is also needed in theory part. And it is very difficult to score good marks without covering theory. Theory part covers one third portion of examination marks on an average. As it is shown in the above statement, the theory part of the costing plays a key role in your examination. I am also trying to cover questions of **CIMA (London)**, and **ACCA (London)**.

You may leave your precious suggestion: ravishanker7511@gmail.com.

“My best wishes with you”

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Analysis of Past Years Examination of Total Marks (Practical and Theory)

CHAPTERS	2013 (N)	2013 (M)	2012 (N)	2012 (M)	2011 (N)	2011 (M)	2010 (N)	2010 (M)
Development in Business Environment	20	25	26	14	13	26	24	25
Decision Making – Cost Concepts	14	5	8	5	11	14	5	5
Decision Making – CVP Analysis	-	5	4	29	18	-	28	18
Pricing Decision	4	20	12	-	10	9	4	4
Transfer Pricing	12	4	11	10	8	11	-	-
Costing of Service Costing	16	-	7	4	-	11	4	-
Standard Costing	8	8	9	6	10	5	-	12
Budget & Budgetary control	5	8	4	16	10	7	19	7
<u>Operational Research</u>								
Simulation	8	4	7	4	4	5	4	7
Learning Curve theory	4	4	4	-	4	-	4	11
Assignment	5	5	8	4	6	10	-	-
Transportation	4	8	5	8	-	9	8	4
CPM and PERT	8	11	5	4	6	10	-	-
Linear Programming	8	8	9	8	10	5	6	-

The above table consists of analysis of recent past year's trend of examination question marks weightage. Please check your coverage before appearing in the examination by using last year examination question asked by ICAI, Compilation or Scanner. The most reliable sources of study for examination are:

1. ICAI Module.
2. ICAI Practice Manual.
3. Suggested answer by ICAI.
4. Last 3 attempts RTP.
5. Compilation issued by ICAI.
6. Scanner.

“DO NOT BELIEVE IN A THING BECAUSE YOU HAVE READ ABOUT IT IN A BOOK. DO NOT BELIEVE IN A THING BECAUSE ANOTHER MAN HAS SAID IT WAS TRUE. DO NOT BELIEVE IN WORDS BECAUSE THEY ARE HALLOWED BY TRADITION. FIND OUT THE TRUTH FOR YOURSELF. REASON IT OUT. THAT IS REALIZATION.”

SWAMI VIVEKANANDA

Coverage of Last 2 Attempts Examination Question With Proper Analysis by RS Academy

ANALYSIS 2013(N) PAPER

Q. No.	Topic/Chapter	Marks	Module	Q. No.	Page No.	Comment
1.						
(a)	Relevant Costing	5	Decision Making	5(a)	75	Same question
(b)	Assignment	5	O.R	-	-	Concept part Covered
(c)	Budgetary control	5	Basic	12	94	Similar question
(d)	Relevant Costing	5	Decision Making	2	74	Same question
2.						
(a)	Pricing Decision	4	Decision Making	-	-	Discussed in the class
(b)	Simulation	8	O.R	5	11	Same question
(c)	Just In Time	4	Decision Making	-	-	Topic discussed in the class
3.						
(a)	Service Costing	12	Basic	13	17	Same Question
(b)	Uniform Costing	4	Theory	-	48	Point no. 10
4.						
(a)	Transfer Pricing	12	Decision Making	21	162	Same question
(b)	Learning Curve	4	O.R.	1	3	Similar question
5.						
(a)	Standard Costing	8	Basic	10	58	Same question
(b)	L.P.P	8	O.R.	-	-	Covered in the part of the every simplex question
6.						
(a)	Activity Based Costing	8	Decision Making	17	33	Same question without change in any digit
(b)	Critical Path Analysis	8	O.R.	36	53	Small part of said question
7.						
(a)	Service Costing	4	Theory		47	Point No.: 1
(b)	Value Chain Analysis	4	Theory		17	Point No.: 10.6
(c)(i)	Transportation	2	Theory		53	Point No.: 2.3
(c)(ii)	Transportation	2	Not Covered			
(d)	Types of cost	4	Basic			Covered in class notes and discussed
(e)	Budgeting	4	Theory		43	Point 14 and part of discussion

ANALYSIS OF 2013(M) PAPER

Q. No.	Marks	Topic	Module	Question No of Module
1				
(a)	5	Further processing decision	Decision Making	Covered in Class as example
(b)	5	Pricing Decision	Decision Making	P-11, Page No: 144,
(c)	5	Assignment	O.R.	Covered in Class as concept
(d)	5	Indifference Point	Basic	Similar to P-37, Page No: 37,
2				
(a)	8	Activity Based Costing	Decision Making	Similar to P-25, Page no: 38
(b)	8	Budgeting and Budgetary Control	Basic	P-13, Page No: 92
3				
(a)	8	Linear Programming	O.R.	P-29, Page No: 56
(b)	8	Standard Costing	Basic	Similar to P-29, Page no: 63
4				
(a)	8	Transportation	O.R.	Similar to P-17, Page no: 29
(b)	8	Throughput Accounting	Decision Making	P-56, Page No: 57
5				
(a)	12	Pricing Decision	Decision Making	Similar to Q.No: 17, Page-147
(b)	4	Cost Sheet, Profitability Analysis and Reporting	-	-
6				
(a)	7	CPM/PERT	O.R.	Similar to P-30, Page no: 43
(b)	4	Learning Curve	Theory	Point No – 5.3 Page no: 58
(c)	5	Other Chapters	Theory	Point No – 58, Page – 49
7				
(a)	4	Theory of Constraint	Theory	Point 11.1, Page No: 18
(b)	4	Simulation	Theory	Point 4.7, Page No: 57
(c)	4	Pricing Decision	Theory	Point 1, Page No: 31
(d)	4	CPM/PERT	Theory	Point 3.5 & 3.6, Page No: 55
(e)	4	Transfer Pricing	Theory	Point 4, Page: 35

Development in the Business Environment

1. Life Cycle Costing:

1.1 Meaning [2002(M), 2003(N), 2004(N), 2007(M), 2010(N)] (4 marks)

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.

- 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 most effective.
- Most accounting system report on a period-by-period basis and product profits are not monitored over their life cycles. In contrast, product life-cycle reporting involves tracing costs and revenues on a product-by-product basis over several calendar periods throughout their life cycle.

1.2 Phases of Product Life Cycle [2011(N)] (4 Marks)

Product life cycle consists of following four stages:

(i) Introduction :

- ❖ During introductory phase, product is launched into the market.
- ❖ Its customers are innovators.
- ❖ Competitor is almost negligible and profits are none-existence.

(ii) Growth :

- ❖ Under growth phase, sales and profit rise, at a fast pace.
- ❖ Competitor enters in the market often in large numbers.
- ❖ As a result of competition, profit start declining near the end of the growth phase.

(iii) Maturity :

- ❖ During the phase of maturity sells continues to increase, but at a decreasing rate.
- ❖ When sells level off, profits are decline.
- ❖ The main reason is intense price competition; some firms extend their product line with new model.

(iv) Saturation and decline :

- ❖ Under this phase of product life cycle demand of the product disappear.
- ❖ Better and less costly substitute is available in the market.

1.3 Uses of Product Life Cycle

- (i) Planning tool: It characterizes the marketing challenges in each stage and poses major alternative strategies, i.e. application of kaizen.
- (ii) Control tool: The PLC concept allows the company allows the company to measure product performance against similar products launched in the past.
- (iii) Forecasting tool: It is less useful because sales histories exhibit diverse patterns and the stages vary in duration.

1.4 Product Life Cycle Characteristics Industry Phase

Basis	Introduction	Growth	Maturity	Decline
Number of firms	Small, growing fast	Large	Shakeout, number stabilizes	Small, exit
Market size	Small	Large	Large	Declining
Market	Fast	Fast	Slow	Negative
Entry	Large	Medium	Low	Negative
Market Leader Characteristics	Existing Reputation innovator, Educator, Flexible, Total solution	Existing Reputation Marketing, Quality production Modular.	Reputation for quality, low cost production and distribution, specialization	Low cost, serves place market
Profit	Negative	Low, but sharply increasing	High, then declining	Low, then negative
Product Varieties	Few and Growing	Increases, then declines to few dominant designs	Increasing specialization segmentation	Declining
Investment	High	High	Low	Negative
Average costs	High, falling	Medium, falling	Low	Negative
Foreign Trade	Low export	Increasing export	Initial exports then imports	Import
Customer Name	Innovator/Early Adopter	Early Majority	Late Majority	Lagged
Customer Needs	Sophistication, Features, Fit	Performance	Price/Performance	Low price
Customer Knowledge	Low	Medium	High	High, Declining
Product Complexity	High	Product simplified	Low standardization & commoditization	Low
Information Collection	Demand, Customer awareness and satisfaction,	Marketing, relative performance, product	Cost reduction, new markets, competitive threats	Capacity reduction, new uses, new uses, new features
Marketing Strategy	Promotion of brand and market	Build brand identity	Segment market; steal business	New promotions; Bitter attacks

1.5 Stages of a Product Life Cycle

[2003(N)] (7 Marks)

- Market research:** Market research establishes what does product the customer want and how much he is prepared to pay for it and how many he will buy.
- Specifications:** It describes product design, product life, maximum permissible maintenance cost, maximum permissible manufacturing cost etc.
- Design:** Designers provide the drawings and process schedules which provide geometry of product and some of the manufacturing process.
- Prototype manufacture:** Under this stage small number of the product are produce to meets the requirements of the specification.

- e) **Development:** Under this stage testing and changes are made in the product to meet the requirement of the specification.
- f) **Tooling:** Tooling up for production mean building a production line costing several lakhs of rupees, building expensive jigs, buying special purpose machine tools. We may say that it is decision phase whether it is profitable or not and should it be produced?
- g) **Manufacturing:** This stage involves purchase of raw materials, purchase of components, and use of labour and assemble the product.
- h) **Selling:** In this stage products are sold.
- i) **Distribution:** In this stage products are distributed to the sales outlets and to the customers.
- j) **Product support:** Under this stage products are free replacement and free services are provided.
- k) **Decommissioning or Replacement:** After end of life of product, the plant used to build the product must be re-used, sold, scrapped or decommissioned.

1.6 Importance of Life Cycle Costing [2006(M)] (4 Marks)

- (i) Non-production (pre-production) costs are significant like research and development costs, design, marketing and customer services and these costs are essential for target price and value engineering.
- (ii) It helps to decide whether R&D and design activities should be undertaken, where R&D and design cost constitute high % of total life cycle cost.
- (iii) A complicated design may lead to huge expenditure on material and labour cost every time the product is produced. Life cycle budgeting highlights costs throughout the product life cycle and facilitates value engineering at the stage before costs are locked in. (locked in means committed)

1.7 The major characteristics of product life-cycle concept are as follows : [2004(N)] (5 marks)

- (i) The products have limited lives and pass through the cycle of development, introduction, growth, maturity, decline and deletion at varying speeds.
- (ii) Profit per unit varies as products change through their life cycles.
- (iii) Each phase of the product life-cycle poses different threats and opportunities that give rise to different strategic actions.
- (iv) Finding new uses or new users or getting the present users to increase their consumption may extend the life of the product.
- (v) Products require different functional emphasis in each phase-such as an R&D emphasis in the development phase and a cost control emphasis in the decline phase.

1.8 Essential features of Life Cycle Costing [2009(M)] (5 Marks)

- (i) Tracing of costs and revenue of product over several calendar period-throughout their entire life cycle.
- (ii) Emphasis is on cost and revenue accumulation over the entire life cycle of the product.
- (iii) Life cycle costing traces design and development costs.
- (iv) It focuses on development costs, incurred to individual products over their entire life cycles.
- (v) Total magnitude of research and development costs are reported and compared with product revenues generated in later periods.

1.9 Benefits of the Product Life Cycle [2002(N), 2004(N), 2010(M)] (4 marks)

- (i) It is an earlier action to generate revenue or to lower cost than otherwise might be considered.
- (ii) Better decision should be taken after the assessment of revenues and costs in the earlier stage of the product.
- (iii) It promotes long-term rewarding in difference to short-term profitability rewarding.
- (iv) It provides an overall framework for considering total incremental costs over the life span of a product.

2. Activity Based Costing/ Activity Based Management

2.1 Meaning of Activity Based Costing [2000(M), 2005(N)] (4 Marks)

- Activity Based Costing is an accounting methodology that assigns costs to activity rather than products or services.
 - It enables resources & overhead costs to be more accurately assigned to products & services that consume them.
- Or,
- According to **CIMA** “Cost attribution to cost units on the basis of benefits received from indirect activities i.e. ordering cost, setting up, assuring quality etc.”
 - ABC assign cost to activity based on their use of resources. It then assigns cost to objects, such as products or customers, based on their use of activities.

2.2 Difference Between Traditional Costing and ABC System [2007(N)] (5 Marks)

Activity Based Costing	Traditional Absorption System
Overheads are related to activities and grouped into activity cost pools.	Overheads are related to cost centers/departments.
Activities are classified as – (i) Unit Level, (ii) Batch Level, (iii) Product Level and (iv) Facility Level activities.	Only (i) Unit Level (Variable) and (ii) Facility Level (Fixed) activities are identified.
Costs are related to activities and hence are more realistic.	Costs are related to cost centers and hence not realistic of cost behavior.
Activity-wise cost drivers are determined.	Time (Hours) are assumed to be the only cost driver governing costs in all departments.
Recovery-wise recovery rates are determined and there is no concept of a single overhead recovery rate.	Either multiple overheads recovery rate (for each department) or a single overhead recovery rate may be determined for absorbing overheads.
Cost are assigned to cost object, e.f. customers, products, services, departments, etc	Costs are assigned to cost units i.e. to products, or jobs or hours.
Essential activity can be simplified and unnecessary activity can be eliminated.	Cost centers/departments cannot be eliminated. Hence not suitable for cost control.

2.3 Factor promoting the development of Activity Based Costing system includes or Need for emergence of Activity Based Costing [2004(M)] (5 Marks)

- (i) Growing overhead costs because of increasingly automated production

- (ii) Increasing market competition which necessitated more accurate product costs.
- (iii) Increasing product diversity to secure economies of scope & increased market share.
- (iv) Traditional costing fails to capture cause and effect relationship.
- (v) Traditional costing often to highlight inter-relationship among activities in different department.
- (vi) Decreasing costs of information processing because of continual improvements and increasing application of information technology.

2.4 The following are the reasons for adoption of ABC by manufacturing and non-manufacturing Industries [2004(M), 2007(N)] (5 Marks)

- (i) ABC helps to estimate cost of individual product or service more accurately.
- (ii) The costs associated with bad decisions have increased substantially.
- (iii) Reduction in the cost of data processing has reduced the cost of tracking resources consumption to large number of activities.
- (iv) Demand on resources by products/customers differs among product/customers. Therefore, product/customer profitability can be measured reasonably or accurately, only if consumption of resources can be traced to each individual product/customer.
- (v) New production techniques have resulted in the increase of the proportion of support service costs in the total cost of delivering value to customers. ABC improves the accuracy of accounting for support service costs.

2.5 Following reason may create problem for adoption of ABC system in service organization [2005(M)] (4 Marks)

- (i) It is quite difficult to establish appropriate cost drivers for facility sustaining cost.
- (ii) Cost objective are difficult to be specified when products are intangible.
- (iii) Introduction of ABC system become expensive when required information for setting up of ABC system is not available.

2.6 ABC support corporate strategy in many ways such as [2005(N)] (4 marks)

- (i) Information generated by ABC system can also encourage management to redesign the products.
- (ii) ABC system will report on the resource spending.
- (iii) Performance based accurate feedback can be provided to cost centre managers.
- (iv) ABC provides data which effectively support to operational level and strategic level.
- (v) Accurate product costing will help the management to compare the profits of various customers, product lines and to decide on price strategy.

2.7 ABC and Decision Making [2000(N)] (4 Marks)

The areas in which Activity based information is used for decision making are as follows:

1. Transfer pricing
2. Make or buy decisions and outsourcing
3. Pricing decision
4. Plant closed down decision or shut down decision
5. Capital investment decision and Product line profitability.

2.8 Stages in Activity Based Costing/Activity Based Management

1. Identification of the activities that have taken place in the organization.
2. Group overheads into cost pools, according to how they are driven. This involves gathering overheads that are caused by same activity into one group.
3. Identifying the cost drivers for each activity (that is, what causes the activity to be incurred).
4. Calculate a cost per unit of cost driver

$$\text{Cost driver rate} = \frac{\text{Total cost of Activity}}{\text{Cost driver}}$$
5. Absorb activity costs into production based on the usages of cost drivers.

2.9 Practical stages in the implementation of ABC

[IMP]

Following are practical stages in the ABC implementation are as follows:

1. **Staff training:**
 - The co-operation of the workforce is critical to the successful implementation of ABC.
 - They are closet to the process and most aware of the problems.
 - Staff training should be, as far as possible, jargon-free, and create an awareness of the purpose of ABC.
2. **Process specification:**
 - Interviews with key members of personnel will identify the different stages of the production process, the commitment of resources to each, processing time and bottlenecks.
 - The interviews will yield a list of transactions which may, or may not, be defined as activity at subsequent stage.
3. **Activity definition:**
 - The listed transactions must be rationalized in order to aggregate those in similar categories and eliminate those deemed immaterial.
 - The resultant cost pools will likely have a number of different events, or drivers, associated with their incurrence.
4. **Activity driver selection:**
 - A single driver covering all of the transactions grouped together in an 'activity' probably does not exist.
 - Multiple driver models could be developed if the data were available, but cost-benefit analysis has rarely shown these to be desirable.
5. **Costing:**
 - A single representative activity driver can be used to assign cost from the activity pools to cost objective.

2.10 Different level of activities that drive the expenses at the product level:

[2002(N), 2006(N)]

Following are four different categories of activities that drive the expenses at the product level.

1. **Unit level activities:**
 - ❖ Unit level activities are the activities whose costs are strongly help to the number of units produced.
 - ❖ For example, the use of indirect materials and indirect consumable tends to increase in proportion to the number of units produced.

2. Batch level activities:

- ❖ Batch level activities are the activities whose costs are driven by one number of batches of units produced.
- ❖ For example- material ordering cost and machine set up cost falls into this category they are incurred for the batch.

3. Product level activities:

- ❖ Product level activities are driven by the creation of a new product line and its maintenance.
- ❖ For example, advertising costs and product designing costs fall into this category because they are incurred for the individual product.

4. Facility level activities:

- ❖ Facility level activities costs are related to maintaining the building and other facilities required by a concern.
- ❖ For example plant security costs and maintenance cost fallen into this category.

2.11 Definition of Activity Based Management (ABM)

- Activity Based Management (ABM) is used to describe the cost management application of ABC.
- The use of ABC as a costing tool to manage cost at activity level is known as Activity Based Cost Management (ABM).
- ABM is a discipline that focuses on the efficient and effective management of activities as the route to continuously improving the value received by customers.
- ABM utilizes cost information gathered through ABC. Through various analysis, ABM manages activities rather than resources.

2.12 Benefits of Activities Based Cost Management

- (i) Provision of clear understanding of the underlying causes of business processing costs.
- (ii) Provision of excellent basis and focus for cost reduction.
- (iii) Provision of excellent basis for effectiveness of management decision making.
- (iv) Provides operational management with a clear view of HOW to implement an Activity Based budget.
- (v) Identification of key process waste element permits management prioritization and leverage of key resources.

2.13 Difference Between Activity Based Costing and Activity Based Management

Activity Based Costing	Activity Based Management
The ABC refers to the technique for determining the cost of activities and the output that those activities produce.	The ABM is a much broader concept. It refers to the management philosophy that focuses on the planning, execution and measurement of activities as the key to competitive advantage.
It is logical distribution of overhead i.e., overhead should be distributed on the consumption of resources consumed by products and services.	It is discipline that focuses on efficient and effective management of activities as the route to improve the value received by customer and profits received by providing this value.
It helps to avoid distorted product/service cost.	It helps in cost reduction, business process re-engineering, and benchmarking and performance measurement, etc.

2.14 Uses of Activity Based Management

Activity Based Management is used for a variety of business applications. Such as:

- (i) **Cost Reduction:**
 - ABCM helps the organisation to identify costs against activities and to find opportunities to streamline or reduce the costs or eliminate the entire activity, especially if there is no value added.
 - It is particularly useful in identifying and quantifying process waste and providing vehicle for continuous process improvement through continuous cost reduction.
- (ii) **Activity Based Budgeting:**
 - Activity based budgeting analyse the resource input or cost for each activity.
 - It provides a framework for estimating the amount of resources required in accordance with the budgeted level of activity.
 - Key elements of activity based budgeting are a (i) Type of work to be done, (ii) Quantity of work to be done, (iii) Cost of work to be done.
- (iii) **Business Process Re-engineering:**
 - Business process re-engineering involves examining business process and making substantial changes to how organization currently operates.
 - ABCM is a powerful tool for measuring business performance, determining the cost of business output and is used as a means of identifying opportunities to improve process efficiency and effectiveness.
- (iv) **Bench Marking:**
 - Bench marking is a process of comparing of ABC-derived activity costs of one segment of company with those of other segments.
 - It requires uniformity in the definition of activities and measurement of their costs.
- (v) **Performance Measurement:**
 - Many organization are now focusing on activity performance as a means of facing competitors and managing costs by monitoring the efficiency and effectiveness of activity.
 - Activity performance measures consist of measure relating to costs, time, quality and innovation.

2.15 Practical application of ABC

ABC and Coca Cola Enterprises Belgium (CCEB):

- CCEB produces, distributes, and sells the different brands of 'The Coca Cola Company'.
- In the field of distribution, it is also CCEB who services the entire Belgian and Luxembourg market.
- CCEB is present in more than 85,000 points of sale.
- Like many other company CCEB was confronted with an increasing Cost of Serve (CTS) due to a changing customer landscape.
- This created a challenge to which CCEB needed to formulate decision answers to stay on track towards achieving their growth path and their company objective.
- When companies are confronted with increasing CTS, it is essential to analyse the organization, its revenues and costs and its processes down to the most to the most detailed level of information. It is this data that give the true reasons behind certain evolutions so that management can take fact based decisions. When having such a challenge at hand, Activity Based Costing is the most advanced and complete method to gain this information. Thus CCEB wanted to use the information from ABC analysis to formulate:
 - Cost/Profit modeling
 - Performance Modeling and
 - Set-up an internal recharge mechanism to sales

- By implementing Activity-Based Costing, CCEB obtained the right information that enabled them to harmonise and streamline the process of their different distribution centres.
- This made it possible for CCEB to calculate the costs in a fair and transparent way, so that the sales force is charged correctly according to the complexity that supply chain had to deal with.
- From the capacity insights that CCEB got from Activity-Based Costing are
 - Optimising efficiency and capacity within the logistic department
 - Designing the most efficient processes, based on the time equations from ABC Analysis.
 - Implementing “best practice” processes in the CCEB distribution centres.

These actions successfully reduce their Cost of Serve and still be in line with the new corporate S&M-strategy.

3. Target costing

3.1 Meaning

[2000(N), 2007(N)] (4 Marks)

- It is estimation of process which is based on understanding of
- Customer's supposed value for the product or service and how competitor will price competing products or services.
- Target costing is a customer-oriented technique that is widely used by Japanese companies and which has recently been adopted by companies in Europe and the USA.

A **major feature of target costing** is that a team approach is adopted to achieve the target cost.

- The team members include designers, engineering, purchasing, manufacturing, marketing and management accounting personnel.
- Their aim is to achieve the target cost specified for the product at the prescribed level of functionality and quality.

3.2 Feature of Target Costing System

1. Target costing is viewed as an integral part of the design and introduction of new products.
2. A target selling price is determined using various sales forecasting techniques.
3. It established relationship between target selling price and volume.
4. Target costing is also determined cost reduction target.
5. The total target is broken down into its various components, each component is studied and opportunities for cost reductions are identified.

3.3 Advantages of Target costing

The **major advantage** of adopting targeting costing is that

1. It is determined during a product's design and planning stage so that it can have a maximum impact in determining the design and planning the level of the committed costs.
2. It is repetitive process with the design team, which ideally should result in the designs that give an expected cost is equal or less than target cost.
3. If the target cost cannot be achieved then the product should not be launched.
4. Foster partnership with supplier
5. Minimise non value-added activities.
6. Encourages selection of lowest cost value added activities.

3.4 Disadvantages of Target Costing

1. Effective implementation and use requires the development of detailed cost data.
2. Its implementation requires willingness to cooperate.
3. Requires many meeting for coordination.
4. May reduce the quality of products due to the use of cheap components which may be of inferior quality.

3.5 Stages of Target costing [2000(Nov), 2004(M), 2006(N)] (4 Marks)

1. **Stage 1:-** Determine the target price which customers will be prepared to pay for the product.
2. **Stage 2:-** Deduct a target profit margin from the target price to determine the target cost.
3. **Stage 3:-** Estimation of actual cost of the product.
4. **Stage 4:-** If estimated actual cost exceeds the target cost investigate ways of driving down the actual cost to the target cost

3.6 Steps of implementing a Target Costing System

Following steps are followed for implementation of Target Costing System:

- (i) **Create a project charter:** The target costing effort should begin with a document approved by senior management that describes its goals and what it is authorized to do.
- (ii) **Obtain a management sponsor:** The strongest possible support from the top management helps in obtained goals of target costing and support the initiative in all aspects – obtaining funding, lobbying other members of top management, working to eliminate road blocks, and ensuring that other problem are overcome in timely manner.
- (iii) **Obtain a budget:** The target costing program requires funds to ensure that one or more well-staffed design teams can complete target costing tasks.
- (iv) **Assign a strong team manager:** Team functions properly is to assign to the effort a strong manager skilled in dealing with management, the use of project tools, and working with a diverse group of people.
- (v) **Enroll full-time participants:** A target costing team members puts the greatest effort into the program when he or she is focused only on target costing.
- (vi) **Use project management tools:** Target costing can be a highly complex effort especially for high-cost products with many features and components.

3.7 Problem with Target Costing

1. During development phase the team may require a number of design repetitions before it can plan a sufficient low-cost product to meet target cost and target profit margin. But project manager is unwilling to “pull and plug” on a design project that cannot meet its costing goals within a reasonable time frame. Or, longer product development times because of numerous changes to design and costings.
2. Large amount of cost cutting may increase dissatisfaction among the various part of company, especially for employee.
3. Design team can sometime make it more difficult to reach a consensus on the proper design because there are too many opinion regarding design issues.

3.8 Impact of Target Costing on Profitability

Target costing improves profitability in two ways:-

- (a) It places such a detailed continuing emphasis on product costs throughout the life cycle of every product.
- (b) It improves profitability through precise targeting of the correct prices at which the company feels it can field a profitability product in the marketing that will sell in a robust (healthy) manner.

3.9 Target Costing may assist control of costs and pricing of product as under [2008(N)](4 Marks)

- (a) Target costing considers the price that ought to be charged by a company to achieve a given market share.
- (b) Target costing should take life cycle costs in to consideration.
- (c) If there is a gap between the target cost and expected cost, ways and means of reducing or `
- (d) The target cost may be used for controlling costs by comparison.

3.10 Benefits of Target Profit [2010(M)] (3 Marks)

- (a) It helps to create company's competitive position in market oriented management approach.
- (b) Management control system focuses on cost reduction with value addition.
- (c) It helps to retain or increase market share by aligning the product with customer needs.
- (d) It promotes team spirit.

3.11 Target Costing Control Points

(1) Identification of Principal control point:

- Experience shows that there always comes a point, where the cost of maintaining the design team exceeds the savings gardened from additional repetitions.
- It is also necessary that most products should be launched within a reasonably short time or they will miss the appropriate market.
- This emphasis that the principal control points over the course of target costing programme should be properly taken care of.

(2) Point of Go/No Go decision:

- If target costing is not reached, management retains power to abandon the design project.
- There comes a point, when actual performance is very close to expected performance in matter of cost incurrence.

(3) Milestone can be in terms of timer or points:

- A milestone can be in the terms of time say one month or one year etc.
- It can also be on the points in design process, at which specific activities are completed.

3.12 Practical application and non-application of Target Costing

A. Target Costing is not possible in following industries:

1. Fast-Food Restaurant:

- Design team can lay out the floor plan of a fast food restaurant, with the objective of creating an arrangement that allows employees to cover the shortest possible distances with preparing food and serving customers; this is similar to design of a new product
- However, unlike a product design, this layout can be readily altered at any time if the design team can arrive at a better layout, so that the restaurant staff can continue to experience high levels of productivity improvement even after the initial design and layout of the facility.
- In this situation costs are not locked in during the design phase, so there is less need for target costing.

2. Chemical Costing & Chemical Production Industry:

- Another situation where target costing results in less value is the production of raw materials, such as chemical.
- In such case there are no design features for a design team to labour over; instead, the industrial engineering staff tries to create the most efficient possible production process, which has little to do with cost reduction through the improvement of customer value by creating a product with a high ratio of features to costs.

B. Application of Target Costing:

Target costing and A Textile Manufacturer of the USA:

- A major textile manufacturer in the USA introduced a target costing system.
- Beginning the project, they realized the need for better-cost management and have worked to overcome that issue.
- The company's journey has led them to a realization that cost management is different from other accounting efforts, and has undertaken a target costing program to help them build profit and decrease the cost of their products at the design stage.
- They recognised the importance of breaking down the traditional barriers of the firm towards cost management. This approach was addressed using of three strategies.

Strategy 1:

Separate the functions of managerial and financial accounting so that each could serve its customer to the best advantages. This separation is important to any management accounting evolution.

Strategy 2:

Achieve a level of accurate product costing. This accuracy school of cost management obviously is concerned with accurate product costs. Although this goal sometimes sounds simplistic, it is not always that easy to get product costs as close to actual as possible.

Strategy 3:

Going from the accuracy school to target costing. Costing products accurately is a worthy goal. Accurate product costing, however, in and of itself does little to improve the firm's position and does nothing to reduce costs. This strategy includes the discovery that an overwhelming majority of costs were created and built into the products before the manufacturing process ever begins.

4. Value Engineering/Value Analysis

4.1 Meaning

[1999(M), 2009(N)] (4 Marks)

- It is systematic interdisciplinary examination of factors affecting the cost of a product or service in order to devise means of achieving the specified purpose at the required standard of quality and reliability at the target cost.
- The aim of value engineering is to achieve the assigned target cost by
- Identifying improved product designs that reduce the product's cost without sacrificing functionality (value added cost) and
- Elimination unnecessary functions that increase the product's costs and for which customer are not prepared to pay extra for (i.e. non value added cost).

4.2 Difference Between Value Added and Non-value Added activities costs**[2006(M)] (4 Marks)**

Value Added	Non Value Added
Value added activities are those activities which add value to the product or service.	Non value added activities are those activities which do not add value to the product or service.
These activities are necessary for the performance of the process.	These activities are not fully necessary for the performance of the process.
It represents work that is valued by the external and internal customer.	It represents work that is not valued by the external or internal customer.
They improve the quality or function of a product.	They do not improve the quality or function of a product.
Customers are usually willing to pay for the service hence value added activities result in cost not in loss.	They create waste result in delay of some sort, add cost to the product or service for which the customer is not willing to pay.

4.3 Value Analysis and Cost Reduction**[2000(M), 2009(N)] (5 Marks)**

In value analysis each and every product or component of a product is subjected to a critical examination so as to ascertain its utility in the product, its cost, cost benefit ratio and better substitute etc.

Value analysis can do cost reduction in the following manner:

- By identifying and removing unnecessary components in a product which had utility earlier.
- By introducing component substitution at a lesser cost without affecting the quality of the product.
- By simplifying the product design.
- By introducing alternative methods with less cost but improved efficiency.

4.4 Importance of Value Analysis in Cost Reduction**[2000(M)] (4 Marks)**

Value analysis consists of examining each product or component critically a check-list containing the following representative questions may be useful for achieving cost reduction:

- What is the precise function of an item? How important is this function?
- What is the cost of the item? Is the cost commensurate with its utility?
- Can a standard item be substituted for a non-standard item?
- Will a change in the design lead to a lower process cost or a lower material cost?
- Can the item be redesigned to make it more durable?
- Are there any possible economies available in packaging or shipping, etc.?

4.5 Business Process Re-engineering

- Business process re-engineering involves examining business process and making substantial changes in the day to day operation of the organisation. It involves the redesign of work by changing the activities.
- A business process consists of a collection of activities that are linked together in coordinated & sequential manner to achieve goal & objective.
- The aim of business process re-engineering is to improve the key business process in an organisation by focusing on
 - Simplification
 - Cost reduction
 - Improved quality and
 - Enhanced customer satisfaction.

5. Total Quantity Management

5.1 Meaning

[2002(N), 2011(N) 2012(M),] (4 Marks)

- A situation where all business functions are involved in a process of continuous quality improvement has been adopted by the company.
- The emphasis of TQM is to design and build quality in, rather than trying to inspect it in, by focusing on the causes rather than the symptoms of poor quality.

5.2 Definition of Quality Term

- (i) Quality : It is measure of goodness to understand how a product meets its specifications.
- (ii) Quality Cost : Cost of performing the activities to check failure in meeting the quality specification.
- (iii) Quality Control (QC) It is concerned with the past, and deals with data obtained from previous production which allow action to be taken to stop the production of defective units.
- (iv) Quality Assurance (QA) It deals with the present, and concerns the putting in place of systems to prevent defects from occurring.
- (v) Quality Management (QM) It is concerned with the future, and manages people in a process of continuous improvement to the products and services offered by the organisation.

5.3 Differentiate between Quality Planning, Quality Planning, Quality Control & Quality Improvement

Quality Planning	Quality Control	Quality Improvement
Determine who are the customers	Choose control subject what to control.	Establish the infrastructure need to secure annual quality improvement
Determine the needs of the customers	Choose units of measurements – Evaluate Measurement	Identify the specific needs for improvement – the improvement projects
Development product feature that respond to the customer's need	Establish standard of performance	For each project establish a project team with clear responsibility for bringing the project to a successful conclusion.
Development process that agreeable to product feature	Measure actual performance	Provide the resources, motivation and training needed by the teams

5.4 Steps of implementation of TQM

Following steps are to be taken in implementation of TQM:

Stage 1: Who is the customer?

Stage 2: What does the customer expect from us?

Stage 3: What are the customer's decision-making requirements?

Stage 4: What problem areas do we perceive in the decision-making process?

Stage 5: How do we compare with other organizations? What can we gain from benchmarking?

Stage 6: What does the customer think?

Stage 7: Identification of improvement opportunities

Stage 8: Quality improvement process or elimination of deficiencies solutions

- (a) Determination of new strategies
- (b) Elimination of deficiencies
- (c) Identifying solution

5.5 Quality Cost**[2011(N)] (5 Marks)**

Cost of performing the activities to check failure in meeting the quality specification. These specifications are as follows:

1. Prevention costs:

- These costs are incurred in preventing the production of products that do not conform to specification.
- They include the costs of preventive maintenance, quality planning, quality engineering, quality audits, design review and training and the extra costs of acquiring higher quality raw materials.

2. Appraisal cost:

- These cost are incurred to ensure that materials and products meet quality conformance standards
- They include the costs of inspection product acceptance, packaging inspection, field testing, continuing supplier verification.

3. Internal failure costs:

- These costs are associated with materials and products that fail to meet quality standards.
- They incurred before the product is dispatched to the customers.
- They include scrap, rework, re-inspection, re-testing, and repairs etc.

4. External failure costs:

- These costs are incurred when products or services fail to conform to requirements or satisfy customer needs after they have been delivered.
- They include costs of handling customer complaint, warranty replacement, repairs of returned products and discount due to defects.

5.6 Six C's of successful implementation of TQM/ Essential Requirement for Successful Implementation of TQM [2005(M), 2007(M), RTP 2011(N)-RTP 2012(M),] (5 Marks)**1. Commitment:**

- Quality improvement must be everyone's job (i.e. group job).
- Clear commitment from the top management, steps necessary to provide an environment for changing attitudes and breaking down barriers to quality improvement must be provided.
- Support and training for this must be extended.

2. Culture: Proper training must be given to effect changes in culture and attitude.**3. Continuous Improvement:** Recognition of room for improvement continually as a process, and not merely a one-off programmed.**4. Cooperation:** Must be ensured by involving employees by resorting to mutually agreeable improvement strategies and associated performance measures**5. Customer Focus:** Perfect service with zero defectives with satisfaction to end user whether external customer or internal customer.**6. Control:** Documentation, procedures and awareness of current practices ensure checking deviation from the intended course of implementation**5.7 Benefits of implementing TQM****[2008(N)] (4 Marks)**

- (i) There will be increased awareness of quality culture in the organization
- (ii) It will lead to commitment to continuous improvement
- (iii) It will focus on customer satisfaction.
- (iv) A greater emphasis on team work will be achieved

5.8 Critical Success Factors of TQM**[2009(N), 2004(M)] (5 Marks)**

1. Focus on customer needs.
2. Everyone in the organisation should be involved.
3. Focus on continuous improvement.
4. Design quality in product and production process
5. Effective performance measurement system.
6. Rewards and performance measurements should be renewed.
7. Appropriate training and education to everyone to understand the aim of TQM.

5.9 “PRAISE Analysis”**[IMP]**

The PRAISE six-step quality improvement process :

Step	Activity	Elements
1	Problem identification	- Areas of customer dissatisfaction - Absence of competitive advantage - Complacency regarding present arrangement
2	Ranking	Priorities problems and opportunities by - Perceive importance, and - Ease of measurement and solution
3	Analysis	- Ask ‘Why?’ to identify possible causes - Keep asking ‘Why?’ to move beyond the symptoms - and to avoid jumping to premature conclusions - Ask ‘What?’ to consider potential implications - Ask ‘How much?’ to quantify cause and effect
4	Innovation	Use creative thinking to generate potential solutions - Barriers to implementation - available enablers, and - people whose co-operation must be sought
5	Solution	- Implement the preferred solution - Take appropriate action to bring about required changes - Reinforce with training and documentation backup
6	Evaluation	- Monitor the effectiveness of actions Establish and interpret performance indicators to track progress towards objectives - Identify the potential for further improvements and return to step 1

5.10 Four P’s of Quality Improvement Principles**[2009(N)] (4 Marks)**

1. **People:** It will quickly become apparent that some individuals are not ideally suited to the participatory process. Lack of enthusiasm will be apparent from a generally negative approach and a tendency to have prearranged meeting which coincide with the meetings of TQM teams.
2. **Process:** The rhetoric and inflexibility of a strict Deming approach will often have a demotivating effect on group activity.
3. **Problem:** Experience suggests that the least successful groups are those approaching problems that are deemed to be too large provide meaningful solutions within a finite time period.
4. **Preparation:** Training in the workings of Deming- like processes is an inadequate preparation for the efficient implementation of a quality improvement process.

5.11 Remedies Available for Difficulties Experienced during Implementation of Praise [2010(N)] (4 Marks)

Step	Activity	Difficulties	Remedies
1	Problem Identification	- Problems are difficult to identify. - If problem are identified then it is difficult to identify a measurable improvement opportunity.	- Participate in programs like brainstorming, multi voting, panel discussion etc. - Quantification and precise definition of problem
2.	Ranking	- Difference in perception of individual in ranking - Difference in preference based on function e.g. production, finance, marketing etc - Lack of consensus between individuals	- Participative approach - Subordination of individual to group interest
3	Analysis	Adoption of adhoc approaches and quick fix solutions	Lateral thinking and brainstorming
4	Innovation	- Lack of creativity or expertise - Inability to operationalise ideas, i.e. convert thoughts into action points	Systematic evaluation of all aspects of each strategy
5	Solution	Resistance from middle managers	- Effective internal communication - Training of personnel and managers - Participative approach
6	Evaluation	- Problem in implementation - Lack of measurable data for comparison of expectations with actual	Effective control system to track actual feedback system.

5.12 Deming “14 Point” on Quality Improvement

W. Edwards Deming is often referred to as the “father of quality control”. Deming “14 point” are as under:

- “Create constancy of purpose towards improvement”:** Replacement of short-term reaction with long-term planning.
- “Adopt the new philosophy”:** Management should actually adopt his philosophy, rather than merely expected the workforce to do so.
- “Cease dependence on inspection”:** If variation is reduced, there is no need of inspect manufactured items for defects, because there won’t be any.
- “Move towards a single supplier for any one item”:** Multiple supplier mean variation between feedstock (raw material used to supply a machine or industry process)
- “Improve constantly and forever”:** Constantly strive to reduce variation
- “Institute training on the job”:** If people are inadequately trained, they will not all work the same way, and this will introduce variance.
- “Institute leadership”:** Deming makes a distinction between leadership and mere supervision.
- “Drive out fear”:** Management by fear as counterproductive in the long term, because it prevents workers from acting in the organization’s best interests.
- “Break down barrier between departments”:** Another idea central to TQM is the concept of the ‘internal customer’, that each department serves not the management, but the other departments that use its outputs.

10. **“Eliminate slogans”**: Another central TQM idea is that it’s not people who make most mistakes -it’s the process they are working within. Harassing the processes they use is counter-productive.
11. **“Eliminate management by objectives”**: Deming saw production targets as encouraging the delivery of poor-quality.
12. **“Remove barrier to pride of workmanship”**. Many of the other problems outlined reduce worker satisfaction.
13. **“Institute education and self-improvement ”**
14. **“The transformation is everyone job”**

5.13 The Plan-Do-Study-Act Cycle

- The Plan-Do-Study-Act (PSDA) cycle describes the activities a company needs to perform in order to incorporate continuous improvement in its operation.
- This cycle, is also referred to as the Shewhart cycle or the Deming wheel.
- The circular nature of this cycle shows that continuous improvement is a never-ending process.
- Specific steps in the cycle:
 - (i) **Plan:**
 - Evaluation of current process and formulation of plan based on finding of problem.
 - Information obtained through evaluation of current process should be used to develop a plan for improvement as well as specific measure to evaluate performance.
 - (ii) **Do:**
 - Implementation of the plan
 - During implementation process managers should document all changes made and collect data for evaluation.
 - (iii) **Study/Check:**
 - Study of data collected in the planning step.
 - The data are evaluated to see whether the plan is achieving the goals established in the plan phase.
 - (iv) **Act:**
 - Act on the basis of the results of the first three phases.

Communicate the results to other members in the company and then implement the new procedure if it has been successful.

5.14 Six Sigma

- Six sigma is the statistical measure used to ensure quality of products and services.
- The Six sigma academy has developed a break through strategy consisting of measure, analyze, improve and control, that allows companies to make exceptional bottom-line improvement.
- In addition to the material and labour savings, which flow directly to the bottom line, a company engaged in six sigma can expect to see.
 - Improved customer satisfaction
 - Reduction cycle time
 - Increased productivity
 - Reduction in total defect
 - Improved process flow.

5.15 Practical application of TQM**Tata Steel:**

- Tata steel has maintained the confidence to improve performance globally even in the face of a challenging economic climate in which the steel industry happens to be severely affected.
- One factor that contributes to this confidence is the Company adherence to Total Quality Management (TQM) to achieve its goals.
- Since the formal incorporation of TQM for Business excellence in the late 1980's Tata Steel has adopted a number of improvement initiatives popular around the world.
- At Tata steel's European operations, Continuous improvement activities are focused on providing Business Units with the ability to drive business through Lean Management, a common strategy deployment process, training of CI coaches and knowledge sharing through operations.
- Tata Steel maintains a systematic approach towards improving productivity and enhancing quality while reducing cost at the same time.
- The Singapore operations concentrated on yield improvement, reduction in power consumption and a significant bottom line benefit.
- The Xiamen operations have also adopted measures to reduce vulnerability caused by price fluctuations.
- Tata Steel's has initiated a culture of value creation with customers and suppliers.
- Specific approaches focus on the 'needs' of the customer as opposed to 'want's Programme include those on Customer Value Management, Retail Value management, and Solution for sales and Suppliers Value Management.
- The company emphasis effective daily work management practices, a clean and safe work environment and consistency and stability of processes as important factors in sustaining development and growth.
- In the face of high raw-material price volatility and an overall trend of rapidly increasing prices, in 2009-10 the procurement Division of Tata Steel India focused its efforts on keeping these trends in check by leveraging long-term contracts and relationship, and on minimizing risk by hedging and through various other strategic sourcing tools, including innovations and improvement initiatives using Total Quality Management precepts.
- Tata Steel is the first integrated steel company in the world, outside of Japan, to win the Deming Application Prize. The steel giant won the 2008 prize for achieving distinctive performance improvement through the application of total quality management (TQM).

General Electronic Company and Motorola Inc:

- Today's customers demand and expect high quality. Companies that do not make quality a priority risk long-run survival.
- World-class organization such as General Electric and Motorola attribute their success to having one of the best quality management programs in the world.
- These companies were some of the first to implement a quality program called, Six Sigma, where the level of defects is reduced to approximately 3.4 parts per million.
- To achieve this, everyone in the company is trained in quality. For example, individuals highly trained in quality improvement principles and techniques receive a designation called "Black Belt." The full-time job of Black Belts is to identify and solve quality problems.
- In fact, Motorola was one of the first companies to win the prestigious Malcom Baldrige National Quality Award in 1988, due to its high focus on quality.

Both GE and Motorola have had a primary goal to achieve total customer satisfaction. To this end, the efforts of these organization have include eliminating almost all defects from products, processes, and transactions. Both companies consider quality to be the critical factor that has resulted in significant increase in sales and market share, as well as cost saving in the range of millions of dollars.

6. Just in Time System

6.1 Meaning [2003(N), 2008(N), 2011(N)] (4 Marks)

- It is mechanism for reducing non-value added cost and long-run costs.
- It involves a continuous commitment to the pursuit of excellence in all phases of manufacturing system design and operation.
- The aims of JIT are to produce the required items, at the required quality and in the required quantities, at the precise time they are required.

6.2 Goals of JIT

- Elimination of non-value added activities;
- Zero inventory;
- A 100% on time delivery service.
- Zero defects Batch sizes of one;
- Zero breakdowns;

6.3 Steps involves in implementation of JIT

- (i) **Evaluation of supplier:** Evaluation of supplier by purchase staff in regard to quality of supply and reliability.
- (ii) **Inspection:** Visit of supplier site and inspection of supply quality there to ensure quality and time etc.
- (iii) **Monitoring of output:** A small cluster of machines are operated who can monitor each output part from machine to machine within the cell and can immediately identify defective output.
- (iv) **Power to stop machines:** Empowered workforce are allowed to stop their machine when they see a problem and take all action for immediate resolution of the bulk of performance problems.

6.4 Necessary condition for successful implementation of JIT [2008(N)] (5 Marks)

Following are necessary condition for successful implementation of JIT:

1. The need of smooth and uniform production rates and the need to avoid fluctuation in production rates since this will lead to excess work in progress.
2. A description of the pull/kanban system.
3. The need to ensure a cell production layout and that workers have multiple skills.
4. Focus on eliminating non-value added activities.
5. Focus on routine and preventative maintenance to avoid machine downtime.
6. Focus on reducing set-up time to a minimum.
7. Establishment of JIT purchasing arrangement accompanied by establishing close relationship with suppliers.

6.5 Elimination of Wastage of Resources [2003(N)] (4 Marks)

JIT helps in reducing the wastage of time in the following way:

- All inspection time is eliminated from the system as operators conduct their own quality checks.
- All movements which involve shifting inventory and WIP throughout various parts of the plant are

eliminated by clustering machines together in logical groups.

- Storage time is eliminated by clearing out excessive stocks of inventory and having suppliers deliver parts only as and when needed.
- Cost drivers are charged to wasteful activities that accumulate costs. By shrinking the amount of wastage of time out of the manufacturing process, a company effectively eliminates activities that do not contribute to the value of production.

6.6 Reduction of Inventory Costs Through Implementation of JIT

Following inventory costs are reduced through implementation of JIT:

- (i) Interest cost related to the debt that funds the inventory investment.
- (ii) Cost of inventory that becomes obsolete over time.
- (iii) Cost of rent for inventory storage facilities.
- (iv) Cost of all equipment used in the warehouse.
- (v) Cost of warehouse utilities.
- (vi) Cost of insurance needed to cover the possible loss of inventory.

6.7 Competitive Advantage from Implementation of JIT

JIT provides competitive advantage in the following ways:

- (i) Stock holding costs are avoided by elimination of Stock of raw materials and finished goods.
- (ii) Elimination of non-value added activities and elimination of cost in this direction will improve competitive advantages.
- (iii) It affords flexibility to customer requirements where the company can manufacture modified product.
- (iv) It focuses the direction of performance based production of high quality product.
- (v) It minimize waiting times and transportation time.

6.7 Effects on Profitability of the Organization

[2007(M)] (4 Marks)

JIT approach helps in improving organization profitability:

- (i) **By eliminating non-value added activity:**
 - It do not improve the quality or function of a product or service
 - but they increase the cost of the product or services.
- (ii) **Zero Defects:**
 - JIT firms decrease defect rates subsequently reducing their inventory and enhancing the attributes of their products.
 - Zero defect policy eliminates all internal and external failure costs.
- (iii) **Cellular manufacturing system:**
 - The operators are trained to operate all the machines on the line and undertaking preventive maintenance.
- (iv) **Adopting pull manufacturing system:**
 - Pull manufacturing system reduces idle time thereby reducing cost of production.
- (v) **JIT purchasing:**
 - It reduces investment in raw materials and WIP stocks.
 - It also reduces cost through saving in factory space and availing benefit of negotiating with fewer suppliers and reducing of paper work.

6.8 JIT in Production Process**[2011(N)] (4 Marks)**

- (i) Products, Spare parts/materials are received directly at production floor. Inspection is completed before delivery of materials.
- (ii) Set up time is minimized while also reducing long production runs, thereby eliminating defectives, and scrap and product obsolescence.
- (iii) Work-in-progress is reduced by use of kanban card or working cells or both.
- (iv) Workers are trained on a variety of machines, allowed to stop machines when they identify a problem, fix it or call the repair team and adequately compensated.
- (v) Supporting systems such as administration, accounting and cost reporting are suitably modified to shift from the conventional mode to the improved JIT requirements

6.9 Impact of JIT on Overhead Costs

- The costs of material handling, facilities, and quality inspection decline when a JIT system is installed.
- In addition, the reduction of all types of inventory results in a massive reduction in the amount of space required for the warehouse facility.
- Since all costs associated with the warehouse are assigned to the overhead cost pool, the amount of overhead is reduced when the costs of staff, equipment, fixed assets, facilities, and rent associated with the warehouse are sharply cut back.

6.10 Problem Associated With JIT**[IMP]**

Following problems are associated with JIT:

- (a) It is not always easy to predict patterns of demand.
- (b) JIT makes the organization far more vulnerable to disruptions in the supply chain.
- (c) JIT was designed at a time when all toyots's manufacture was done within a 50 km radius of its headquarters. Wide geographical spread, however, makes this difficult.

6.11 Performance Measurement in a JIT System

- a) **Inventory turnover** : Those who have installed JIT system emphasise the extraordinarily high inventory turnover that they now experience.
- b) **Setup time reduction** : The shortest possible setup intervals are crucial for the success of short production run, so this is a major JIT measurement.
- c) **Customer complaints** : The accumulation of customer complaints and their dissemination to management should be considered a major JIT measure.
- d) **Scrap** : Little waste should be generated by a JIT system, which means that materials scrap should be driven down to exceedingly low level.
- e) **Cost of quality** : one focus of JIT is on creating high-quality products, so it is reasonable to keep track of the full cost of quality (which comprises defect control costs, failure costs, and the cost of lost sales) on a trend line.
- f) **Customer service** : this measure really has several components – delivering products on the dates required by customers, shipping full orders to customers, and not having products returned because of poor quality.
- g) **Ideas generated**: A JIT system works best when employees pitch in with hundreds of suggestion for improvement that. When taken in the total, result in vastly improved, efficient operation.

6.12 Impact of JIT on Other Costs

Following other cost also reduce because of implementation of JIT:

- Interest cost related to the debt that funds the inventory investment
- Cost of inventory that becomes obsolete over time
- Cost of rent for inventory storage facilities
- Cost of all equipment used in the warehouse
- Cost of warehouse utilities
- Cost of warehouse employees
- Cost of insurance needed to cover the possible loss of inventory
- Cost of taxes on the inventory

6.13 Features of JIT

The five main features of JIT production system:

- (i) Organise production in manufacturing cells, a grouping of all the different types of equipment used to make a given product. Material handling cost are reduced.
- (ii) Hire and retain workers who are multi-skilled so that they are capable of performing a variety of operations, including repairs and maintenance tasks. Thus, labour idle time gets reduced.
- (iii) Apply TQM to eliminate defects. Defects arising in one stage can hamper the other stages. JIT creates urgency for eliminating defects as quickly as possible.
- (iv) Place emphasis on reducing set-up time which makes production in smaller batches economical and reducing inventory levels. Thus company can respond to customer demand faster.
- (v) Carefully selected suppliers capable of delivering high quality material in a timely manner directly at the shop – floor, reducing the material time.

6.14 Essential Pre-requisites of a JIT System

- Low variety of goods
- Vendor reliability
- Good communication
- Demand stability
- TQM
- Defect free materials
- Preventive maintenance

6.15 Practical use of JIT

1. Concept of JIT followed by ‘Mahindra & Mahindra’:

M&M wanted to implement JIT at their main plant in Nasik as they were aware of the fact that JIT approach will help them to operate with minimal levels of inventory.

Their business objective was to make all our suppliers active participants in the production process. They wanted that the supplier should be enabled to know of any change in the whole production process and at the same time contribute actively. This was necessary to reduce the time-to-respond to a situation and help “Just-in-time” approach in the production process.

Objective:

- Make all the suppliers active participants in the production process.
- Suppliers should be able to know of any change in the whole production process and at the same time contribute actively.
- Update to best practices for supply strategies for 400 vendors, 150 vehicles per day and 1,100 parts
- Improvement of the replenishment efficiency
- Reduction of stock at the assembly line favoring a flexible manufacturing

2. JIT and VSS Service

Concept planning for JIT and supply chain including defining of load units and their arrangement at the assembly line, definition of the replenishment trigger concept, design of stores and handling equipment and review of the method of supply from vendors.

Implementation of the proposed concept:

Solution:

Modular standard metal containers and totes based on Indian truck dimensions. Load units ergonomically presented to the workers.

25 JIT parts identified (supplied in sequence), two-tier shelving system for totes with dynamic allocation and picking containerized supply from local vendors with round pick up.

Reduced personnel and replacement lead time; improved manufacturing flexibility.

Benefits:

- By making the suppliers participant in the 'just in time' method of production, they could maintain the least inventory level.
- Suppliers could see real time the status of the suppliers, bill settlement and host of other parameters.
- All active participants of a process, for instance, the process from a supplier to the dealer can handle change management with the help of a particular solution and a defined process.
- Set up times are significantly reduced in the warehouse. Cutting down the set up time to be more productive allowed the company to improve their bottom line to look more efficient.
- Having employees focused on specific areas of the system allowed them to process goods faster instead of having them vulnerable to fatigue from doing too many jobs at once and simplifies the tasks at hand
- Increase emphasis on the supplier relationships.

7. Enterprise Resource Planning and Material Requirement Planning

7.1 Meaning of ERP

[2002(M), 2006(N)] (4 Marks)

- Enterprise resource planning (ERP) software
- It attempts to integrate all departments and functions across a company into a single computer system that can serve all those different departments' particular needs.
- It combines all computerized departments together with the help of a single integrated software
- It helps to various departments to share information and communicate with each other.

7.2 Benefits of ERP**[2004(M), 2006(N), 2010(N)] (4 Marks)**

Following are the benefits of ERP:

- ❖ Product costing.
- ❖ Inventory management.
- ❖ Competitive edge by improving business process.
- ❖ Quick response to change in market condition.
- ❖ Sales service.
- ❖ Automatic control of quality.
- ❖ Distribution and delivery of products.
- ❖ E-commerce

7.3 Features of ERP**[2003(M), 2004(N)] (3 Marks)**

Following are major features of ERP:

- 1) It is covering all functional areas like manufacturing, selling and distribution, payables, receivables, inventory etc. of a company.
- 2) It performs core activities and increases customer services thereby augmenting the corporate image.
- 3) ERP bridges the information gap across organization.
- 4) ERP provides complete integration of systems.
- 5) It is a solution for better project management.
- 6) It allows automatic introduction of latest technologies like electronic fund transfer (EFT), Electronic Data Interchange (EDI), Internet, Intranet, Video Conferencing, E-commerce etc.
- 7) It eliminates most business problems like material shortage, productivity enhancements, customer service, cash management etc.
- 8) It provides business intelligence tools.

7.4 Meaning of Material Requirement Planning**[2002(M)] (5 Marks)**

- Material Requirement Planning (MRP) systems is a computer-based inventory information system used to plan and control raw materials and component parts inventories.
- It is usually used to plan a future time period of a manufacturing operation, like a month, quarter, or even a year into the future.
- Originating in the 1960s, MRP systems were designed to serve the large EOQ lot-size principles of inventory management commonly used at that time.

7.5 Objectives of MRP**[2004(M)] (4 Marks)**

- (i) To determine the quantity of finished goods demanded.
- (ii) To ascertain quantity of raw materials and components required for production.
- (iii) To ascertain components and raw-materials bought in relation to the order received.
- (iv) To ascertain inventories, WIP, batch sizes and manufacturing and packing lead time.

7.6 Pre-requisition for Successful Operation of MRP System [2011(M)] (5 Marks)

Following are pre-requisition for operation of MRP system:

- (i) The latest production and purchasing schedules prepared should strictly follow. Day to Day change from predetermined schedules will cause disorder in production and purchase.
- (ii) Standard should be set for the consumption quantity, quality, mix and yield of raw materials for every unit of finished product.
- (iii) Quantity of Raw Materials, sub-assembly and components required for production should be pre-determined.
- (iv) Work-force must be appraised and need for absolute adherence to the schedules prepared.
- (v) Internal control system should be developed to ensure total adherence to the schedule.
- (vi) Accuracy of the data supplied vital to the MRP system.

7.7 Data required to Operate MRP System [2010(N)] (4 Marks)

Following data are required to operate MRP system:

- (i) **The master production schedule:** it specifies the quantity of each finished units of products to be produced and the time at which each unit will be required.
- (ii) **The Bill of materials file:** it specifies the sub-assemblies, components and materials required for each of the finished goods.
- (iii) **The inventory file:** it maintains details of items in hand for each sub-assembly, components and materials required for each of the finished goods.
- (iv) **The routing file:** it specifies the sequence of required to manufacture sub-assemblies, components and finished goods.

8. Divestment Strategy

8.1 Meaning [2009(M)] (4 Marks)

- Divestment involves a strategy of selling off business operations to divert the resources, so released, for other purposes.
- Selling off a business segment or product division is one of the frequent forms of divestment strategy.
- It may also include selling off or giving up the control over subsidiary where wholly owned subsidiary company's securities are quoted.

8.2 Reason for Divestment Strategy [2009(M)] (4 Marks)

1. To earn more profit sell out unprofitable or less profitable product or segment and utilized the resources realized from unprofitable or less profitable product or segment in more profitable product or segment. Cost benefit analysis and Capital Budgeting Method are useful tools for it.
2. In case of purchase of new business, it may be found that some of the part of the acquired business is not up to the mark. In such a case such part is disposed off.
3. In case where any business segment or product or subsidiary is pull down the profit of the whole organization, it is better to cut down of that operation of the product or business segment.

9. Synchronous Manufacturing

9.1 Meaning

[2010(M)] (5 Marks)

- It is an all-encompassing manufacturing management philosophy
- It includes a set of principles, procedures, and techniques where every action is evaluated in terms of common goals of the organization.

9.2 Principles of synchronous Manufacturing

[2010(M)] (5 Marks)

- a) Focus on synchronizing the production flow than on idle capacities.
- b) Value of time at a bottleneck resource is equal to the throughput rate of products processed by the bottle neck.
- c) Value of time at a non-bottleneck resource is negligible.
- d) Level of utilization of a non-bottleneck resource controlled by other constraints within the system.
- e) Resources must be utilized, not simply activated.
- f) Transfer batch should not be equal to the process batch.
- g) A process batch should be variable both along its route and overtime.

10. Value Chain Analysis

10.1 Meaning

[2002(N), 2009(June)] (4 Marks)

- The VALUE CHAIN is 'The sequence of business activities by which, from the perspective of the end user, value is added to the products and services produced by an entry.
- Or,
- Value Chain Analysis is a continuous process of identifying Value Chain which will yield the maximum competitive advantages and applying the organisation resources to each linked process so as to achieve cost effectiveness.

10.2 Business Function

- 1) Research and Development – New ideas for products, service or process
- 2) Design - Planning and engineering
- 3) Production - Coordination and assembly of resources to produce a product.
- 4) Marketing - Teaching customers about products and persuading them to purchase.
- 5) Distribution – Delivery to customers
- 6) Customer Service – Support to customers

10.3 Benefits of Value Chain Analysis

[2006(M), 2009(J)] (4 Marks)

- (i) Value Chain Analysis helps the organization to better understand which segments, distribution channels, price points, product differentiation. Selling proposition and value chain configuration will yield them the greatest competitive advantage.
- (ii) It helps managers in deciding how to apply the organisation's valuable physical and human resources to each linked process so as to achieve cost effectiveness.

- (iii) Value analysis facilitates cost reduction in the following manner :
 - By identifying and removing unnecessary components in a product which had utility earlier.
 - By introducing component substitution at a lesser cost without affecting the quality of the product.
 - By simplifying the product design.
 - By introducing alternative methods with less cost but improved efficiency.
- (iv) Value chain analysis offers an excellent opportunity to integrate strategic planning with management accounting to guide the firm to growth and survival.

10.4 Value Chain and Cost Reduction

Value chain can do cost reduction in the following manner:

- By identifying and removing unnecessary components in a product which had utility earlier.
- By introducing component substitution at a lesser cost without affecting the quality of the product.
- By simplifying the product design.
- By introducing alternative methods with less cost but improved efficiency.

10.5 The Value Chain and Competitive Advantage

[IMP]

According to Porter, an organisation can develop sustainable competitive advantages by following one of two strategies

- (a) **Low-cost strategy** – Essentially this is a strategy of cost leadership, which involves achieving a lower cost than competitors via access to low-cost raw material; innovative process technology; low-cost access to distribution channel or customers; and superior operating management.
- (b) **Differentiation strategy** – This involves creating something that customers perceive as being unique via brand loyalty, superior customer service, product design and features, technology and so on.

As competitive advantage is gained either from providing better customer value for equipment cost or equipment customer value for lower cost, value chain analysis is essential to determine where in an organisation's value chain costs can be lowered or value enhanced.

10.6 Business Activities

1. Primary Activities

Primary activities are directly related to production, sales, marketing, delivery and service.

	Comments
Inbound logistics	Receiving, handling and storing inputs to the production system (warehousing, transport, inventory control and so on)
Operation	Converting resources inputs into a final product. Resource inputs are not only materials. 'People' are a 'resource' especially in service industry.
Outbound logistics	Storing the product and its distribution to customers (packaging, warehousing, testing and so on)
Marketing and sales	Informing customers about the product, persuading them to buy it, and enabling them to do so (advertisement, promotion and so on)
After sales service	Installing products, repairing them, upgrading them, providing spare parts and so on.

Support Activities

Support activities provide purchased inputs, human resources, technology and infrastructure functions to support the primary activities.

	Comments
Procurement	Acquiring the resource inputs to the primary activities (such as purchase of materials, subcomponents equipment)
Technology development	Designing products, improving processes and/or resource utilization
Human resource management	Recruiting, training, developing and rewarding people
Firm infrastructure	Planning, finance, quality control (Porter believe they are crucially important to an organisation's strategic capacity in all primary activities.)

10.7 Steps involved in “Value Chain Analysis” approach for assessing its competitive advantage [2002(N)] (4 Marks)

Following steps are involved in “Value Chain Analysis” approach for assessing its competitive advantages

- (i) **Internal cost analysis** — Organisations use the value chain approach to identify sources of profitability and to understand the cost of their internal processes or activities.

The principal steps of internal cost analysis are:

- Identify the firm's value-creating processes.
- Determine the portion of the total cost of the product or services attributable to each value-creating process.
- Identify the cost drivers for each process.
- Identify the links between processes.
- Evaluate the opportunities for achieving relative cost advantage.

- (ii) **Internal differentiation analysis** — To understand the sources of differentiation (including the cost) within internal value-creating processes. In this situation, the primary focus is on the customer's perceived value of the products and services. Guidelines for using differentiation:

- Identify the customer's value-creating processes.
- Evaluate differentiation strategies for enhancing customer value.
- Determine the best sustainable differentiation strategies.

- (iii) **Vertical linkage analysis** — To understand the relationships and associated costs among external suppliers and customers in order to maximise the value delivered to customers and to minimise cost.

Vertical linkage analysis includes the following steps:

- Identify the industry's value chain and assign costs, revenues and assets to value-creating process.
- Diagnose the cost drivers for each value-creating process.
- Evaluate the opportunities for sustainable competitive advantage.

10.8 Strategic Framework for Value Chain Analysis:

Value chain analysis requires a strategic framework or focus for organizing internal and external information, for analyzing information, and for summarizing findings and recommendations. Useful strategic frameworks for value chain analysis are:

- (i) **Industry Structure Analysis**

- Michael Porter developed a five factors model as a way to organize information about an industry structure to evaluate its potential attractiveness.

- Under this model. The profitability of an industry or market – measure by the long-term return on investment of the average firm – depends largely on five factors that influence profitability.
- Factors which influence profitability are:
 - a) Bargaining power of buyer
 - b) Bargaining power of suppliers
 - c) Threat of substitute products or services
 - d) Threat of new entrant
 - e) Intensity of competitor

(ii) Core Competencies Analysis

- Industry structure analysis is well suited to describing the what of competitiveness, i.e. what makes one firm or one industry more profitable than another.
- Core competencies should tie together the portfolio of end products and help a firm excel in dominating its industry.
- Steps for core competencies for competitive advantage includes following:
 - a) Validate core competencies in current business.
 - b) Export or leverage competencies to the value chains of other existing businesses.
 - c) Use core competencies to reconfigure the value chains of existing businesses.
 - d) Use core competencies to create new value chain.

(iii) Segment Analysis

- Industries are sometimes collection of different market segments. Vertically integrated industries are good example of a string of natural businesses from the source of raw material to the end use by the final consumer.
- This analysis will reveal the competitive advantages or disadvantages of different segments.
- A firm may use this information to decide to exit the segment, to enter a segment, reconfigure one or more segments, or embark on cost reduction/differentiation programs.
- Five steps for using the value chain approach for segment analysis:
 - a) Identify segmentation variables and categories
 - b) Construct a segmentation matrix
 - c) Analysis segment attractiveness
 - d) Examine key success factors for each segment
 - e) Analysis attractiveness of broad versus narrow segment scope

10.9 Approaches to defining Segmentation Variables

Customer Characteristics Approach

Geographic	Small communities as markets for discount stores
Type of organization	Needs of computer for restaurants versus manufacturing firms versus banks versus retailers
Size of firm	Large hospital versus medium firms versus small firms
Life-style	Jaguar buyer tend to be more adventurous, less conservative than buyer of Mercedes-Benz and BMW.
Sex	The Virginia Slims cigarettes for women
Age	Cereals for children versus adults
Occupation	The paper copier needs of lawyer versus bankers versus dentists.

Product-Related Approaches

Use type	Appliance buyer-home builder, remodeler, homeowner
Usage	The heavy potato user-the fast-food outlets
benefits sought	Dessert caters – those who are calorie-conscious versus those who are more concerned with convenience
Price sensitivity	price-sensitivity Honda Civic buyer versus the luxury Mercedes-Benz buyer
Competitor	Those computer users now committed to IBM
Application	Professional users of chain saws versus the homeowner
Brand loyalty	Those committed to IBM versus others

10.10 Limitation of Value Chain Analysis

- (i) **Non-availability of data:** For long term strategic decision making, changes in cost structure, market prices and capital investment etc. data may not be readily available.
- (ii) **Identification of stages:** Identifying stages in an industry's value chain is limited by the ability to locate atleast one firm that participates in a specific stage.
- (iii) **Ascertainment of cost, revenues and assets:** There is no scientific approach and much depends upon trail and experimentation methods hence ascertain cost, revenues, and assets value are not much reliable.
- (iv) **Identification of cost drivers:** identifying value chain linkages across activities and computing supplier and customer profit margins present serious challenges.
- (v) **Resistance from employees:** Value chain analysis is not easily understandable to all employees hence may face resistance form employees as well as managers.

10.11 Distinction Between 'Value Chain Analysis' and 'Traditional Management Accounting'

[2003(M), 2008(N)] (5 Marks)

Basis	Value Chain Analysis	Traditional Management Accounting
Focus	It focuses on external information.	It focuses on internal information.
Prospective	Entire set of linked activities from suppliers to end-use customers	Value added
Cost driver concept	Multiple cost drivers Structural drivers Executional drivers	Single cost driver
Cost containment philosophy	A set of unique cost drivers for each activity	Application at the overall firm level.
Insights for strategic decision	Views cost containment as a function of the cost drivers regulating reductions each value activity.	Across the board cost.

10.12 Practical use of Value Chain Analysis

1. Value Chain Difference: The Telecommunication Industry:

Value chain Process	AT & T	Strategic Difference NYNEX	IBM
Procurement	Own manufacturing Branch	Free to use any supplier it wants	Owns Rolm, CPE manufacturing
Technology Development	Technological leadership through Bell Labs	Focus on software product	Strong R & D in computer hardware and software technologies
Operation	- National presence high quality of equipment through heavy capital expenditure - Similar communications standards nationwide - Strongest national telecommunications network	- Regional monopoly Innovative equipment from outside suppliers - High quality regional heavy capital investment	- Global presence Leading computer technology - Partnership with MCI
Marketing and sales	- New emphasis on marketing (still weak) - High name recognize - Long-term relationship with clients - Recruits computer executives	- Use of Bell logo Focus on top 1,000 corporate customers - Sales and distribution centres close to customers	- Strong reputation for marketing excellence - Already sells to most major corporation - Experienced Sales force

2. Example of Core-Competencies Analysis:

a) Honda:

- One of Honda's core competencies is designing and producing small engines. Honda's produces engines of autos, motorcycles, snowmobiles, lawnmowers, snow blowers, chain saws and power tools. (i.e. Manufacturing capabilities)
- Other Honda core competencies are dealership management and shorter product development cycles. (i.e. Culture of innovation)

b) Marriot Corp.:

- Marriot Corp. has core competencies in fold service and hospitality skills, standardised hotel operating procedures, and a shared procurement and distribution system.
- Besides employing these core competencies in hotels, the company uses them in its other business, including institutional food service, consumer uses them in its other businesses, including institutional food service, consumer food and restaurants, cruise ship and theme parks.

c) AT&T:

- AT&T extended its core competence as an efficient processor of customer accounts by entering the credit card business.
- Kimberly Clarks's entry into disposable diapers extended its core competence in the design of paper products.

3. Example of use Core competencies to reconfiguring the value chain of existing business:

a) Japanese watch-maker:

Japanese watch-maker side-stepped traditional distribution channels in favour of mass merchandiser such as department store chains.

b) Tetra-Pak:

Tetra-Pak is an excellent example of a firm that reconfigured the value chain in the packaging industry for dairy products and orange juice.

Tetra-Pak designed filling machine for its aseptic packages and changed the packaging industry.

c) IKEA:

IKEA grew from a small Swedish mail-order furniture operation to one of the world's largest retailers of home furnishing.

IKEA selected numerous factors to offer prices that are 25-50 per cent lower than those of competitors. Some of them are as follows:

Value Chain	Major Choice
Design	Simple, high quality, designed to lower cost
Parts	Standard & common, global supplier network
Assembly	By customer
Transport/stocking	Computerised system for suppliers & warehouses
Marketing	Scandinavian image
Display	Focus on designs, not pieces, to create value
Home Delivery	By the customer

4. Example of use of Core competencies to create new value chains:

Federal Express (FedEX):

- FedEx transferred its expertise in the delivery of small packages to contract new business with L.L. Bean for overnight distribution.
- Disney has exported its people-moving skills to urban mass transit for Oakland, California.

5. Example of analyse segment attractiveness:

Frozen Food Industry:

- In the frozen foods industry segmentation independent grocers and and caters may be willing to substitute fresh fruits and vegetable for frozen goods.
- Therefore, the threat of substitutes within the segments and from outside sources must be carefully examined. In addition the interrelationship among segments must be carefully considered.

Automobile Industry:

- The luxury car and sports car segments were high-priced, high-margin products with less intense competition than other automobile segments.
- The introduction of high-quality lower-priced Acura, Lexus and Infinity autos change the competitive structure of these high-priced segment.

11. Others

11.1 Theory of Constraints

[2008(M), RTP 2011(M), RTP 2012(N)] (7 Marks)

The theory of constraints focuses on revenue and cost management when faced with bottlenecks. It advocates the use of three key measures. These are

(a) **Throughput contribution:**

- It is rate at which the system generates profits through sales.
- It is defined as sales revenues less completely variable cost. i.e. sales less material costs only because labour costs tend to be partially fixed and are excluded normally.

(b) **Investment (Inventory):**

- This is equal to the sum of material costs of direct materials inventory, work-in-process and finished goods inventory, research and development costs and the costs of equipment and building.

(c) **Other operating costs:**

- The other operating costs equal to all operating costs (other than direct materials) incurred to earn throughput contribution.
- Other operating cost includes salaries and wages, rent utilities and depreciation.

11.2 Back Flushing

[2009(M), 2010(M), RTP 2011(N)] (4 Marks)

- Back flushing requires no data entry of any kind until a finished product is completed. At that time the total amount finished is entered into the computer system, which multiplies it by all the components listed in the bill of materials for each item produced.
- For determination of closing inventories, components that should have been used in the production process subtracted from opening inventories.
- Back the entire production process. Given the large transaction volumes associated with JIT, this is an ideal solution to the problem.

11.3 Problem with Back Flushing

The following problems must be corrected before it will work properly:

- (i) **Production reporting** : The total production quantity entered into the system must be absolutely correct, if not, then wrong components and quantities will be subtracted from the stock.
- (ii) **Scrap reporting**: All abnormal scrap must be diligently tracked and recorded. Otherwise materials will fall outside the back flashing system and will not be charged to inventory.
- (iii) **Lot tracing** : Lot tracing is impossible under the back flushing system. This is required when a manufacturer need to keep records of which production lots were used to create product in case all the items in a lot need be recalled.
- (iv) **Inventory accuracy** : the inventory balance may be too high at all times because the back flushing transactions that relieves inventory usually does so only once a day, during which time other inventory is sent to the production process. This makes it difficult to maintain an accurate set of inventory records in the warehouse.

11.4 Advantages of Back Flushing

[IMP]

- (a) It is much simpler, as there is no separate accounting for WIP.
- (b) Even the finished goods account is unnecessary.

- (c) The number of accounting should be greatly reduced.
- (d) The system should discourage managers from producing simply for inventory since working material does not add value until the final product is completed.

11.5 Throughput Accounting

- It is an approach to accounting which is largely in sympathy with the JIT philosophy.
- It is the accounting system developed in the UK, based on theory of constraints and JIT.
- In essence, TA assumes that a manager has a given set of resources available. Using those resources to generate sales revenue.
- Throughput contribution = sales revenue – direct material cost.

11.6 Difference Between Throughput Accounting and Traditional Product Cost System and Throughput Accounting

Throughput Accounting	Traditional Product Costing
Value is added when an item is sold.	Value is added when an item is produced.
Schedule adherence and meeting delivery dates are the key to working effectively.	Full utilization of labour and machine time is the key to working efficiently.
Variance analysis only investigates why the scheduled mix was not produced.	Variance analysis investigates whether standards were achieved.
Labour and traditionally defined variable overheads are not normally treated as variable costs.	Labour and traditionally defined variable overheads are treated as variable cost.
Stock is valued in the P&L and balance sheet at material cost only.	Stock is valued in the P&L and balance sheet at total production cost.

11.7 Other Factors that Might Throughput Other Than a Lack of Production (Bottlenecks)

- (a) The existence of a non-competitive selling price.
- (b) The need to deliver on time to particular customers, which may disrupt normal production flow.
- (c) The lack of product quality and reliability, which may cause large amounts of rework or an unnecessary increase in production volume.
- (d) Unreliable material suppliers, which will lead to poor quality products that require rework.

11.8 Industry Value Chain

- Industry Value Chain refers to the series of activities, which add value to the product supplied to the industry.
- The industry value chain starts with the value-creating processes of suppliers, who provide the basic raw materials and components.
- It continues with the value creating processes of different classes of buyer or end-use consumer, and culminates in the disposal and recycling of materials.

11.9 Difference between Cost Control and Cost Reduction [1999(N), 2001(M)] (6 Marks)

Basis	Cost Control	Cost Reduction
Meaning	Comparison of actual with the standards or budgets to regulate the actual cost.	Achievement of real and permanent of real and permanent reduction in unit cost of products manufactured.
Objective	Maintaining the cost in accordance with the established target or standards.	Directed to explore the possibilities of improving the target or standards. It challenges all efforts to better them.
Saving	Temporary saving in cost.	Realistic saving in cost.
Approach	Lacks of dynamism since it aims to attain lowest possible costs under existing circumstances.	It is continuous process and recognizes no condition as permanent.
Applicability	Limited applicability to those items of cost for which standards can be set.	Universally applicable to all area of business.
Nature	It is preventive function	It is corrective function.
Assumption	The existences of certain standards or norms are not challenged.	The existences of standards or norms are subject to challenge.
Function	Cost control does competitive analysis of actual results with established standard.	Cost Reduction is to find out substitute ways and new means like waste reduction, expenses reduction and increased production.
Tools and Techniques	Essential: budgetary control, standard costing and quality control.	Essential: value engineering, work study, quality management, operational research, market research etc.
Emphasis	On the past.	On the present and future.

11.10 Programme for Cost Reduction

Following approach may be used for Cost Reduction:

1. Product Design:

Efficient designing for a new product or improving the design for an existing product reduces cost in the following manner:

- Cheaper substitute, higher yield and less quantity and varieties of materials
- Reduced time of operation and increased productivity.
- Cost of gigs, tools and fixture are to be minimized
- Standardisation and simplification in variety.

2. Organisation:

Following point are taken into consideration for Cost Reduction:

- Defining of each function and responsibility
- Proper assignment of task and delegation of responsibility to avoid overlapping
- A suitable channel of communication between various management levels.
- Co-operation and closed relationship between the various executives.
- Removal of doubts and fiction
- Encouragement to employees for cost reduction suggestion.

3. Factory Lay out:

Following may help in reduction of cost:

- Scope of cost reduction by elimination of wastage of man material and maximum utilization of the facilities available.
- The necessity of replacement of plant, introduction of new techniques or expansion of facilities.

4. Production Plan Programme and Method:

Following points may help for production control:

- Whether wastage of manpower and material is kept to the minimum
- Whether there is any scope for reducing idle capacity.
- Whether the procedure for the control of stores and maintenance services are efficient.
- Whether labour wastage may be reduced and productivity increased eliminating faulty production method, plant layout and designs or introduction incentive schemes.
- Whether there is scope for reduction of overhead by budgetary control system is in operation to ensure the control over overhead costs.

11.11 Cost Reduction Techniques

Tools and techniques for cost reduction:

- Budgetary control and standard cost
- Work study and organisation and method of produce
- Value analysis
- Standardisation
- Simplification and variety reduction
- Economic batch quantity
- Coding and classification
- Improvement in design
- Substitute material utilisation
- Automation
- Operation Research
- Quality Control
- Production planning and Control
- Inventory Control
- Purchase Scheduling
- Job evaluation and merit voting
- Training and development
- Business forecast
- Market Research

11.12 Uniform Costing**[2009(M)] (4 Marks)**

- It is not a distinct method of costing.
- When several undertakings start using the same costing principles or practices, they are said to be following uniform costing.

- Different concerns in an industry should adopt a common method of costing and apply uniformly the same principles and techniques for better cost comparison and common good and helps in mutual cost control and cost reduction.
- It is recommended that a uniform method of costing should be adopted by the member units of an industry.

11.13 Objective of Uniform Costing

The main objectives of Uniform Costing are as follows:

- To eliminate unhealthy competition.
- To improve production capacity level and labour efficiency by comparison the production costs of different units with each other.
- To compare costs and performance of different unit in the same industry.
- To provide relevant data/information to the Government for fixing and regulation of the product price.
- To ensure standardisation and uniformity in the operation of participating units.
- To reduce production, administrative, selling and distribution costs and to exercise control on fixed costs.

11.14 Essential Requisites for the Installation of a Uniform Costing System

[2008(N), 2010(M)] (4 Marks)

Essential requisites for the installation of uniform costing are as under:

- The firm's in the industry should be willing to share / furnish relevant data or information.
- Mutual exchange of ideas, methods used, special achievement made, research and know how etc. should be frequent.
- Bigger firms should take the lead towards sharing their experience and knowhow with the smaller firm to enable the latter to improve their performance.
- In case of accounting methods, principles, procedure and production method uniformity must be established.

11.15 Limitation of Uniform Costing

[2013(N)] (4 Marks)

- Sometimes it is not possible to adopt uniform standards, methods and procedures of costing in different firms due to differing circumstances in which they operate.
- Many firms do not wish to share such information with their competitors in the same industry.
- Small firms in an industry believe that uniform costing system is only meant for big and medium size firms, because they cannot afford it.
- It induces monopolistic trend in the business, due to which prices may be increased artificially and supplies withheld.

11.16 Advantages of Uniform Costing

[Imp]

- The management of each firm will be saved from the exercise of developing and introducing a costing system of its own.
- It facilitates comparison of cost figures of various firms to enable the firms to identify their weak and strong points.
- It provides information to make comparison of its cost data with others.

- (d) Research and development benefits of bigger firms may be made available to smaller firms.
- (e) It helps in the reduction of labour turnover, as a uniform wage system is the pre-condition of a uniform costing system.
- (f) Uniform costing provide a basis for the comparative assessment of the performance of two firms in the same industry but in different sectors.
- (g) It helps the Government in regulating the prices of essential commodities such as bread, sugar, cement, steel etc.

11.17 Inter-Firm Comparison

- It is technique of evaluating the performance, efficiency, costs and profits of firms in an industry.
- It consists of voluntary exchange of information/data concerning costs, prices, profits, productivity and overall efficiency among firms engaged in similar type of operations for the purpose of bringing improvement in efficiency and indicating the weaknesses.

11.18 Requisite of Inter-firm Comparison System

- 1) **Center of inter-comparison:** For collection and analyzing data received from member units, for doing a comparative study and for dissemination of the results of study a central body is necessary.
- 2) **Membership:** Firms of different sizes should members of the Centre entrusted with the task of carrying out inter-firm comparison.
- 3) **Nature of information to be collected:** Following information useful to the management is it general collected by the centre for inter-firm comparison:
 - Information regarding costs and cost structures,
 - Raw material consumption,
 - Capital employed and return on capital,
 - Stock of raw material, wastage of materials,
 - Methods of production and technical aspects etc..
- 4) **Method of collection and presentation:** Information should be supplied by firms is generally in the form of ratio and not in absolute figures and the collected information by centre is stored and presented in the form of report.

11.19 Advantages of Inter-firm Comparison

[2013(M)] (5 Marks)

- (a) It helps a concern in knowing its strengths or weakness in relation to others.
- (b) It ensures an unbiased specialized reporting on particular problem of the industry.
- (c) It develops cost consciousness among members of the industry.
- (d) It helps Government in effective price regulation.
- (e) It helps to improve the quality of products manufactured and to reduce the cost of production.

11.20 Limitation of Inter-firm Comparison

[IMP]

- (a) Top management feels that secrecy will be lost.
- (b) Middle management is usually not convinced with the utility of such a comparison.
- (c) In the absence of a suitable Cost Accounting System, the figures supplied may not be reliable for the purpose of comparison.
- (d) Suitable basis for comparison may not be available.

11.21 Losses and Their Treatment in Cost Account

Nature of loss	Meaning	How to Control over the loss.	Cost accounting treatment
Waste	It represents the portion of basic raw materials lost in storage, handling and in manufacturing processing having no recoverable value. It may or may not be physically presented.	Normal allowance for yield and waste should be made from past experience, technical factors and special features of the material process and product. Actual yield and waste should be compared with anticipated figures and appropriate action where necessary.	Normal Waste: - It is being a normal feature and inherent in the manufacturing therefore normal loss should be charged on the good output. Abnormal Waste: - Waste which is beyond the normal waste should be transferred to the costing profit & loss account.
Scrap	It is incidental residue from certain types of manufacturing of small amount and low value, recoverable without further processing. It is always physically presented.	Standard allowance should be fixed and should be compared with actual scrap. A periodic scrap report would serve the purpose where two or more departments or cost centres are responsible for the scrap.	Where scrap is negligible, the cost of scrap is borne by good units and income from scrap is treated as other income (i.e. credited to costing profit and loss account). The net sale proceeds from scrap value (i.e. sale price of scrap less selling and distribution cost) should be reduced from material or factory overhead rate. It is useful where scrap cannot be segregated job or process wise. The net sale proceeds from scrap value (i.e. sale price of scrap less selling and distribution cost) should be reduced from particular job, process or operation. It is useful where scrap can be identifying with job, process or operation.
Spoilage	When the goods damaged beyond rectification and to be sold suitably without further processing. It is also below the normal quality level.	Actual spoilage should be compared with the standard or normal spoilage. The spoilage should be classified in to normal and abnormal. Appropriate action should be taken for abnormal spoilage.	Normal spoilage: - it is uncontrollable spoilage which is inherent in nature. It should be spread over the good units (i.e. charged to the good units). Abnormal spoilage: - it is arising not because of inherent in nature and it can be avoidable. It should be charged to costing profit and loss account.
Defective	When production of goods below the normal quality but can be rectified.	Defective report should be prepared and causes of defective should be fully investigated so that corrective action may be taken.	Normal defective: - it is inherent nature of production process. Cost of rectification of normal defective should be charged to good units. Abnormal defective: - it is arising in the abnormal situation. It should be charged to the costing profit and loss account.

11.22 Application of cost control in Material Cost

Following are fundamental requirement of such a control:

- Definite responsibility in respect of every function of material control should be specified and allocated.
- Proper co-ordination between the various section/departments responsible for different function should be achieved.

- (iii) Purchasing function should be centralized as far as possible and entrusted to a competent person conversant with purchasing function.
- (iv) Controlled procedure should be standardized and uniform forms and documents should be used all over the organisation.
- (v) A proper system of stock control should be introduced and maintained.

11.23 Cost Management

- Cost management to describe the approach and activities of managers to use resources to increase value to customers and to achieve organisational goals.
- Cost management decision include decisions such as the amounts and kinds of materials used, changes in plant processes, and kinds of material used, changes in plant processes, and changes in product design.

11.24 Distinguish between 'Cost Reduction' and 'Cost Management'

Cost Reduction :

- Cost reduction is the achievement of permanent reduction in the unit cost of goods manufactured or services rendered without impairing their suitability for the use intended or diminution in the quality of product.
- It uses the techniques like value engineering, work study, quality management, operational research, market research etc.
- It is continuous of critical examination, analysis, and challenges of established standards.
- It helps to business in improving the efficiency and effectiveness so that costs are reduced.
- It is a corrective action.

Cost Management :

- Is a broader concept. It aims to optimal utilization of resources to enhance the operating income of the firm.
- It established linkage between costs and revenues. It relates costs and revenues with product attributes to have insight into how various resources attributes generates revenue and create demand on resources.
- It provides information to manage product attributes to optimise resources utilization.

11.25 Practical Application of Theory of Constraints

Theory of Constraints and Sunshine Pte Ltd.

- Sunshine Pte Ltd produces parts for automotive. Its primary measure of productivity is labour absorption under the assumption that if more work is being done to create inventory, profit will increase. However, using this measure resulted in actions to increase inventory and build stock products rather than fill actual customer order.
- Process improvements were implemented to reduce costs. Efforts were made to decrease the labour involved in producing parts. This was done for all operations. Many non-constraints became faster, producing even more work than the constraints could handle. Even though labour went down, inventory increased and it became more difficult to fulfill orders on time and to properly prioritize manufacturing jobs.
- When management learned about throughput, it shifted its focus from absorption costs into inventory to increasing how quickly work could be completed. Emphasis was given to improving constraints. By investing \$89,000 in the facility and adding 3 additional workers to the day shift, output efficiency would have declined on a per labour hour basis. However, the cost was minimal compared to the increase in throughput.