

# **EXAMINATION NOTES**

**M.COM 4th SEMESTER**

**SUBJECT : ADVANCED COST ACCOUNTING**

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# UNIT-1

## INVENTORY SYSTEM (COST ACCOUNTING CONTEXT)

In **advanced cost accounting**, an **inventory system** refers to the **methods and controls used to record, value, and manage materials, WIP, and finished goods** in a way that supports **cost control, cost reduction, and decision-making**.

Inventory affects:

- Cost of production
- Cost of goods sold
- Profit measurement
- Working capital

### Types of Inventory Systems

#### 1. Periodic Inventory System

Inventory is **not continuously updated**.

#### Key Features

- Physical stock count at period end
- Purchases recorded in a purchases account
- Inventory value determined after stocktaking

#### Cost Accounting View

- Less control
- Not suitable for large or complex organizations
- Mostly theoretical relevance in advanced studies

#### COGS Formula:

Opening Stock + Purchases - Closing Stock = Cost of Goods Sold

#### 2. Perpetual Inventory System (Very Important)

Inventory records are **updated continuously**.

#### Key Features

- Every receipt and issue recorded
- Real-time stock balance
- Supported by bin cards & stores ledger

### **Advantages**

- Better cost control
- Stock discrepancies detected quickly
- Essential for standard costing and variance analysis

### **Most widely used in advanced cost accounting**

### **Inventory Control Techniques (Advanced Level)**

#### **1. Economic Order Quantity (EOQ)**

Determines **optimal order size** to minimize:

- Ordering cost
- Carrying cost

#### **EOQ Formula:**

$$EOQ = \sqrt{\frac{2AB}{CS}} \quad EOQ = \frac{CS}{2AB}$$

Where:

- A = Annual demand
- B = Ordering cost per order
- C = Cost per unit
- S = Storage/carrying cost %

#### **2. Just-In-Time (JIT) Inventory System**

Materials are purchased **only when needed**.

#### **Objectives**

- Zero inventory
- Reduced holding cost
- Improved efficiency

#### **Suitability**

- Highly automated production
- Reliable suppliers

Risk: Production stoppage if supply fails

### 3. ABC Inventory Control

Based on **value of inventory**, not quantity.

Category	% of Items	% of Value	Control Level
A	Low	High	Strict
B	Medium	Medium	Moderate
C	High	Low	Simple

Focuses management attention where it matters most

### Inventory Valuation Methods (Cost Accounting Angle)

Used under **perpetual inventory system**:

- FIFO
- LIFO (for internal costing, not financial reporting in many countries)
- Weighted Average
- Standard Cost

### Role of Inventory System in Advanced Cost Accounting

An effective inventory system helps in:

- Material cost control
- Reduction of wastage & losses
- Accurate product costing
- Budgetary control
- Variance analysis
- Decision making (make or buy, pricing, shutdown)

### ABC ANALYSIS

**ABC Analysis** is an **inventory control technique** based on the principle of “**management by exception.**”

It classifies inventory items according to their **annual consumption value** so that **greater control** is exercised over **high-value items**.

It follows the **Pareto Principle (80:20 rule)**.

### Basis of Classification

Items are ranked based on:

Annual Consumption Value = Annual Usage × Unit Price  
 $\text{Annual Consumption Value} = \text{Annual Usage} \times \text{Unit Price}$

### Categories under ABC Analysis

Category	% of Items	% of Inventory Value	Control Required
A	5–10%	70–80%	Very strict
B	15–25%	15–25%	Moderate
C	65–80%	5–10%	Simple

### Features of ABC Analysis

- Based on **value**, not quantity
- Focuses managerial attention on **important few**
- Ensures **efficient use of resources**
- Helps in **cost reduction**

### Advantages of ABC Analysis

- Better inventory control
- Reduction in carrying cost
- Avoids stock-outs of critical items
- Efficient utilization of management time
- Improves purchasing and storage decisions

### Limitations of ABC Analysis

- Ignores criticality of items
- Not suitable where prices fluctuate heavily
- Requires accurate data
- Should be combined with other techniques (like VED, HML)

### Uses of ABC Analysis

- Fixing stock levels
- Inventory review frequency
- Delegation of authority
- Budgetary control
- Store layout planning

### \* JUST-IN-TIME (JIT)

**Just-In-Time (JIT)** is an **inventory management and production system** in which materials are **purchased and produced only when required**, in the **exact quantity and at the exact time** they are needed.

Objective: **Eliminate waste and reduce inventory to minimum (ideally zero).**

### **Key Features of JIT**

- Zero or minimum inventory
- Frequent small purchases
- Continuous production flow
- Close coordination with suppliers
- Emphasis on quality (no defects)
- Short lead time

### **Objectives of JIT**

- Reduce carrying cost
- Eliminate wastage
- Improve quality
- Increase efficiency
- Reduce production cycle time
- Improve cash flow

### **Advantages of JIT**

- Lower inventory holding cost
- Reduced storage space
- Less risk of obsolescence
- Better quality control
- Faster response to customer demand

### **Limitations of JIT**

- High dependence on suppliers
- Risk of production stoppage
- Not suitable where demand is uncertain
- Requires strong planning and discipline

### **Suitability of JIT**

JIT works best when:

- Demand is stable
- Suppliers are reliable
- Production process is standardized

- Lead time is short
- Quality standards are high

### **JIT in Cost Accounting Context**

- Reduces **material cost**
- Minimizes **WIP**
- Simplifies **costing records**
- Supports **lean manufacturing**
- Improves **cost control**

### **JIT vs Traditional Inventory System**

<b>Basis</b>	<b>JIT</b>	<b>Traditional</b>
Inventory level	Very low	High
Purchases	Frequent & small	Bulk
Focus	Waste elimination	Stock availability
Risk	Stock-out	Obsolescence

### **\*AIMS AND OBJECTIVES OF JIT**

#### **1. Minimization of Inventory**

To reduce inventory levels of raw materials, WIP, and finished goods to the **lowest possible level** (ideally zero).

#### **2. Reduction of Inventory Carrying Cost**

To eliminate costs such as:

- Storage
- Insurance
- Handling
- Obsolescence
- Pilferage

#### **3. Elimination of Waste**

To remove all forms of waste including:

- Overproduction
- Waiting time
- Excess movement
- Defective production

#### **4. Improvement in Quality**

To achieve **zero defects** by emphasizing quality at every stage of production.

#### **5. Smooth and Continuous Production**

To ensure uninterrupted production flow by receiving materials **exactly when needed**.

#### **6. Reduction in Production Cycle Time**

To shorten lead time and speed up the manufacturing process.

#### **7. Better Utilization of Resources**

To use men, machines, and materials more efficiently.

#### **8. Improved Supplier Relationships**

To develop close, long-term relationships with reliable suppliers for timely deliveries.

#### **9. Cost Reduction**

To reduce overall cost of production by minimizing waste and non-value-adding activities.

#### **10. Improved Cash Flow**

To avoid blocking funds in excess inventory and improve liquidity.

### **\*METHODOLOGY FOR IMPLEMENTING JUST-IN-TIME (JIT)**

#### **1. Top Management Commitment**

Successful JIT implementation requires strong support from top management to bring cultural and structural changes in the organization.

#### **2. Supplier Development and Integration**

- Select few reliable suppliers
- Develop long-term relationships
- Ensure frequent, small, and timely deliveries
- Reduce lead time

#### **3. Demand Forecasting and Production Planning**

- Accurate demand estimation
- Levelled production (Heijunka)

- Avoid overproduction and idle time

#### **4. Plant Layout Improvement**

- Cellular or product-oriented layout
- Reduced material movement
- Smooth workflow

#### **5. Reduction in Setup Time**

- Quick changeover of machines
- Flexible production systems
- Use of SMED techniques

#### **6. Quality Management**

- Total Quality Management (TQM)
- Zero-defect approach
- Quality at source (no inspection buffers)

#### **7. Employee Involvement and Training**

- Multi-skilled workforce
- Teamwork and empowerment
- Continuous improvement mindset (Kaizen)

#### **8. Inventory Reduction Gradually**

- Phase-wise reduction of inventory
- Eliminate safety stock carefully
- Monitor performance continuously

#### **9. Use of Pull System (Kanban)**

- Production based on actual demand
- Use of Kanban cards/signals
- Avoid push-based production

#### **10. Continuous Improvement and Monitoring**

- Regular performance evaluation
- Cost, quality, and delivery tracking
- Continuous process improvement

## **Impact of JIT on Production Cost / Price**

Just-In-Time (JIT) has a **direct and significant impact** on the **cost of production**, which ultimately affects the **selling price**.

### **1. Reduction in Inventory Carrying Cost**

JIT minimizes raw material, WIP, and finished goods inventory, leading to savings in:

- Storage cost
- Insurance
- Handling
- Obsolescence

**Lower production cost → Lower selling price**

### **2. Reduction in Material Wastage**

Materials are purchased only when required, reducing:

- Spoilage
- Pilferage
- Excess handling

**Material cost per unit decreases**

### **3. Lower Work-in-Progress (WIP) Cost**

Continuous production flow reduces WIP and:

- Shortens production cycle
- Reduces capital tied up

**Lower conversion cost per unit**

### **4. Improved Quality – Lower Rework Cost**

JIT emphasizes **zero defects**, which reduces:

- Scrap
- Rework
- Warranty and rejection costs

**Cost of poor quality is minimized**

### **5. Reduction in Setup and Waiting Time**

Quick setup and smooth flow reduce:

- Idle time of machines
- Labor inefficiency

### **Lower overhead absorption rate**

## **6. Better Utilization of Resources**

Efficient use of men, machines, and materials leads to:

- Higher productivity
- Lower cost per unit

### **Competitive pricing possible**

## **7. Lower Administrative and Inspection Costs**

- Fewer inventory records
- Less inspection due to quality at source

### **Indirect cost reduction**

### **Overall Impact on Production Price**

<b>Aspect</b>	<b>Impact</b>
Cost of Production	Decreases
Unit Cost	Reduces
Profit Margin	Increases (or price reduces)
Selling Price	More competitive
Market Position	Improves

### **\*EFFECT OF JIT ON COSTING SYSTEM**

Implementation of **Just-In-Time (JIT)** brings significant changes in the **traditional costing system** by simplifying cost accumulation and focusing on value-adding activities.

#### **1. Simplification of Costing Records**

- Reduced inventory levels
- Fewer material movement records
- Less documentation

Cost accounting becomes **simpler and faster**

## 2. Reduction or Elimination of Stores Ledger

- Materials move directly to production
- Stores function is minimized

Traditional stores ledger and bin cards become less relevant

## 3. Backflush Costing

JIT often uses **backflush costing**, where:

- Costs are recorded **after production is completed**
- Detailed tracking at each stage is avoided

Saves time and accounting effort

## 4. Reduced Work-in-Progress (WIP) Accounting

- Continuous production flow
- Minimal WIP

Less need for WIP valuation and control

## 5. Change in Overhead Allocation

- Focus on **process-based costing**
- Reduction in non-value-adding overheads

More accurate cost per unit

## 6. Greater Emphasis on Quality Costs

- Prevention and appraisal costs increase
- Failure costs decrease

Costing system highlights **cost of quality**

## 7. Shift Towards Lean / Activity-Based Costing

JIT supports:

- Lean costing
- Activity-Based Costing (ABC)

Better cost control and decision-making

## 8. Improved Cost Control and Variance Reduction

- Fewer material, labor, and overhead variances
- Standard costing variances become less significant

More stable and predictable costing system

### Traditional Costing vs JIT Costing (Quick View)

Aspect	Traditional Costing	JIT Costing
Inventory	High	Very low
Cost Recording	Detailed & frequent	Simplified
WIP Accounting	Extensive	Minimal
Cost Flow	Stage-wise	Backflush
Focus	Control	Elimination of waste

### \* MATERIAL REQUIREMENT PLANNING (MRP)

**Material Requirement Planning (MRP)** is a **systematic technique** used to determine **what materials are required, how much is required, and when it is required** for production, based on the **master production schedule**.

Objective: **Ensure availability of materials while minimizing inventory cost.**

**Definition :** MRP is a **planning and control system** that calculates material requirements based on **production schedules, bill of materials, and inventory records.**

### Elements / Inputs of MRP

#### 1. Master Production Schedule (MPS)

- Specifies *what, how much, and when* to produce finished goods

#### 2. Bill of Materials (BOM)

- Detailed list of materials, components, and sub-assemblies needed

#### 3. Inventory Records

- Information about:
  - Opening stock
  - Orders in hand
  - Lead time

## Working of MRP (Process)

1. Identify production requirements (MPS)
2. Break down product structure (BOM)
3. Check available inventory
4. Calculate net material requirements
5. Schedule purchase and production orders

## Objectives of MRP

- Ensure timely availability of materials
- Reduce inventory levels
- Avoid production delays
- Improve production planning
- Optimize use of resources
- Reduce material wastage

## Advantages of MRP

- Better inventory control
- Reduced carrying cost
- Improved production scheduling
- Lower chances of stock-outs
- Better coordination between departments

## Limitations of MRP

- Requires accurate data
- Expensive to implement
- Complex system
- Not suitable for small organizations
- Ineffective if demand fluctuates heavily

## MRP vs JIT (Very Important Comparison)

<b>Basis</b>	<b>MRP</b>	<b>JIT</b>
Nature	Planning system	Inventory philosophy
Inventory	Planned	Minimal
Demand	Forecast-based	Actual demand
Focus	Material availability	Waste elimination
Flexibility	Less	High

**Material Requirement Planning (MRP)** into **aims, methodology, and methods of operation** in a structured, exam-ready way. I'll cover it clearly so it can be answered in theory or applied questions.

## 1. Aims of MRP

The main aims of **Material Requirement Planning (MRP)** are:

1. **Ensure Material Availability**
  - Provide the right materials in the right quantity at the right time for production.
2. **Reduce Inventory Costs**
  - Minimize raw materials, WIP, and finished goods inventory without affecting production.
3. **Avoid Stock-outs**
  - Prevent production delays due to insufficient materials.
4. **Efficient Resource Utilization**
  - Optimize use of labor, machines, and materials.
5. **Support Production Scheduling**
  - Ensure smooth workflow and timely completion of production orders.
6. **Reduce Wastage**
  - Prevent over-purchasing and minimize scrap.

## 2. Methodology of Implementing MRP

The **step-by-step methodology** for MRP:

1. **Prepare Master Production Schedule (MPS)**
  - Determine production quantity and timing for finished goods.
2. **Prepare Bill of Materials (BOM)**
  - List all materials, components, and sub-assemblies needed for each product.
3. **Check Inventory Records**
  - Include opening stock, items on order, and safety stock.
4. **Calculate Gross Requirements**
  - Total materials required for production according to BOM.
5. **Determine Net Material Requirements**
6.  $\text{Net Requirement} = \text{Gross Requirement} - \text{Available Inventory}$
7. **Schedule Purchase/Production Orders**
  - Decide **when and how much** to order or produce, considering lead times.
8. **Monitor and Update**
  - Continuously track inventory levels and adjust plans.

## 3. Methods of Operations of MRP

MRP operates using the following **methods / approaches**:

### A. Manual MRP

- Calculations done manually using:
  - Paper-based inventory records
  - Charts for scheduling
- Suitable for small-scale operations
- Time-consuming and prone to errors

## **B. Computerized MRP (CMRP)**

- Uses software to calculate requirements:
  - Faster and more accurate
  - Handles complex product structures
  - Integrates with inventory and production systems
- Widely used in modern manufacturing

## **C. MRP-I and MRP-II**

1. **MRP-I:** Focuses on **material planning** only.
2. **MRP-II:** Integrates material planning with **capacity planning, production, and finance**, giving a complete production control system.

## **D. Key Tools in MRP Operations**

- Master Production Schedule (MPS)
- Bill of Materials (BOM)
- Inventory records
- Lead time tables
- Capacity planning data (for MRP-II)

## **\*REQUIREMENTS FOR IMPLEMENTATION OF MRP-I**

To successfully implement **MRP-I**, an organization needs the following prerequisites:

### **1. Accurate Master Production Schedule (MPS)**

- Defines **what finished products** to produce, **how much**, and **when**.
- Must be realistic and based on **forecast or actual demand**.
- Forms the **foundation of MRP calculations**.

### **2. Detailed Bill of Materials (BOM)**

- A **complete product structure** showing all raw materials, components, and sub-assemblies.
- Must specify **quantities, units, and levels** for each item.
- Ensures correct material requirements for each finished product.

### **3. Up-to-Date Inventory Records**

- Accurate information on:
  - Opening stock
  - Material on order
  - Safety stock / reorder levels
- Prevents over-ordering or stock-outs.

#### 4. Lead Time Data

- Knowledge of:
  - Procurement lead time for each material
  - Production time for components
- Essential for **scheduling orders to arrive on time**.

#### 5. Lot Sizing Rules

- Determine **how much to order or produce** per batch:
  - Fixed lot size
  - Economic order quantity
  - Minimum/maximum quantity

#### 6. Reliable Supplier Base

- Suppliers must be **able to deliver on time** and in the required quantity.
- MRP depends heavily on timely material availability.

#### 7. Skilled Personnel / Trained Staff

- Staff must understand:
  - MRP logic and calculations
  - Inventory control and production scheduling
- Helps in proper planning and adjustments.

#### 8. Computerized System (Optional but Recommended)

- Manual MRP is possible for small units, but **computerized MRP** is more efficient:
  - Handles large BOMs
  - Faster calculations
  - Reduces errors

#### 9. Clear Policies on Safety Stock and Priorities

- Decide **which items require safety stock**
- Set priorities for critical materials (e.g., use ABC/VED analysis)

## \*MRP-I AND INVENTORY MANAGEMENT

**MRP-I (Material Requirement Planning – Level I)** is a **systematic approach** to plan material requirements based on production schedules. Its primary goal is to **ensure materials are available in the right quantity at the right time**, which directly impacts inventory management.

### 1. Role of MRP-I in Inventory Management

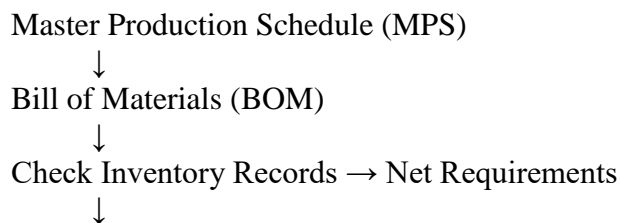
1. **Reduces Excess Inventory**
  - Calculates **net material requirements** based on BOM and inventory records.
  - Prevents overstocking of raw materials, reducing carrying costs.
2. **Prevents Stock-outs**
  - Schedules material procurement according to **lead times**.
  - Ensures availability of materials to avoid production stoppages.
3. **Maintains Optimal Inventory Levels**
  - Determines **when and how much** to order.
  - Helps maintain safety stock only for critical items.
4. **Improves Inventory Accuracy**
  - Integrates data from BOM, MPS, and inventory records.
  - Reduces errors in inventory records and planning.
5. **Supports ABC/VED Analysis**
  - Critical and high-value items are prioritized in planning.
  - Ensures selective control over inventory.

### 2. Advantages of Using MRP-I in Inventory Management

Advantage	Explanation
Lower Carrying Cost	Less idle stock in stores
Reduced Wastage	Avoids over-purchasing and obsolescence
Improved Production Flow	Materials available as per production schedule
Better Planning	Helps plan procurement and production orders
Enhanced Cost Control	Tracks usage and material costs effectively

### 3. How MRP-I Works with Inventory Management

#### Flow:



Schedule Orders → Purchase / Production



Material Delivery → Production



Update Inventory Records

- Inventory is constantly monitored and updated based on MRP-I calculations.
- Only **required quantities** are procured → efficient inventory management.

#### 4. Key Link between MRP-I and Inventory

Inventory Concept	MRP-I Impact
Raw Material	Ordered as per requirement → no overstock
Work-in-Progress	Reduced WIP → faster production cycle
Finished Goods	Produced according to demand → minimal stock
Safety Stock	Maintained for critical items only
Reorder Levels	Calculated dynamically based on demand and lead time

#### \*ZERO INVENTORY SYSTEM (ZIS)

A **Zero Inventory System** is an inventory management approach in which **no stock is kept in stores** — materials, components, and even finished goods are **procured or produced only when required**.

Objective: **Eliminate all inventory holding costs and waste**, ensuring a continuous flow of materials and production.

#### Features of Zero Inventory System

1. **No Stock or Minimum Stock**
  - Materials arrive exactly when needed.
2. **Continuous Production Flow**
  - Production is synchronized with material arrival.
3. **Reliance on Suppliers**
  - Requires timely and reliable supply of raw materials.
4. **Frequent Small Orders**
  - Orders placed frequently in small quantities to meet exact needs.
5. **Emphasis on Planning**
  - Accurate forecasting and scheduling are critical.
6. **Supports JIT Philosophy**
  - Essentially the extreme form of Just-In-Time inventory.

## Objectives of Zero Inventory System

- **Minimize Inventory Cost**
  - Reduces carrying, insurance, and storage costs.
- **Eliminate Wastage**
  - Reduces obsolescence, spoilage, and pilferage.
- **Increase Cash Flow**
  - Capital is not blocked in stock.
- **Improve Efficiency**
  - Smooth production flow and better resource utilization.
- **Enhance Quality Control**
  - Focus on producing only what is needed reduces defects and rework.

## Advantages of Zero Inventory System

Advantage	Explanation
Reduced Inventory Costs	No storage, insurance, or handling costs
Less Wastage	Avoids obsolescence, spoilage, or excess stock
Better Cash Flow	Money is spent only when needed
Efficient Production	Materials arrive just in time
Lean Operations	Supports JIT and lean manufacturing principles

## Limitations / Disadvantages

- **High Dependence on Suppliers**
  - Any delay can stop production.
- **Risk of Stock-Outs**
  - No buffer for emergencies.
- **Requires Accurate Forecasting**
  - Planning errors can disrupt production.
- **Not Suitable for All Industries**
  - Works best where demand is predictable and supply chain is reliable.

## Difference: Zero Inventory vs JIT

Basis	Zero Inventory	JIT
Inventory	Ideally zero	Minimal, some safety stock allowed
Focus	No inventory holding	Waste reduction and efficiency
Risk	High if supply delayed	Moderate, some buffer allowed
Implementation	Requires precise planning	Flexible, gradual implementation

## UNIT-2

### **\*MANUFACTURING RESOURCE PLANNING (MRP-II)**

**MRP-II** is an **integrated method of production planning** that extends **Material Requirement Planning (MRP-I)** by including **not only materials, but all resources needed for manufacturing**, such as labor, machines, and finances.

Objective: **Ensure optimal utilization of all production resources while meeting production schedules efficiently.**

#### **Key Features of MRP-II**

1. **Integrated Planning**
  - Combines **materials, labor, machine capacity, and finance** in one system.
2. **Extends MRP-I**
  - Adds **capacity planning and shop floor control**.
3. **Decision Support**
  - Helps management with budgeting, scheduling, and performance analysis.
4. **Feedback System**
  - Tracks actual vs. planned performance to adjust future schedules.
5. **Computerized System**
  - Typically implemented using ERP software for accuracy and speed.

#### **Objectives of MRP-II**

- **Ensure Material Availability**  
Materials are procured as per production schedules.
- **Optimal Resource Utilization**  
Machines, labor, and materials are used efficiently.
- **Control Production Costs**  
Helps in cost estimation and budgeting.
- **Improve Production Scheduling**  
Enables realistic scheduling and delivery dates.
- **Support Decision Making**  
Provides data for capacity expansion, cost reduction, and productivity improvement.

#### **Components of MRP-II**

1. **Master Production Schedule (MPS)**
  - Determines what products to produce and when.
2. **Bill of Materials (BOM)**
  - Detailed structure of each product.
3. **Inventory Records**

- Stock availability, orders in progress.
- 4. **Capacity Requirements Planning (CRP)**
  - Checks if machines and labor are sufficient.
- 5. **Financial Data**
  - Costing, budgets, and cash flow integration.
- 6. **Feedback & Control**
  - Adjusts future plans based on actual performance.

### Advantages of MRP-II

Advantage	Explanation
Comprehensive Planning	Includes materials, labor, machines, and finance
Efficient Resource Utilization	Avoids under- or over-utilization
Cost Control	Tracks and controls production costs
Improved Scheduling	Realistic and achievable production plans
Better Decision Support	Helps management with strategic decisions

### Difference Between MRP-I and MRP-II

Basis	MRP-I	MRP-II
Scope	Materials only	All manufacturing resources
Planning	Material requirement	Material + capacity + finance
Integration	Limited	Full integration across production
Feedback	Minimal	Continuous adjustment and control
Decision Support	Limited	Comprehensive (cost, capacity, scheduling)

### \*EVOLUTION OF MRP-II

MRP-II evolved as a **logical extension of MRP-I** to integrate all manufacturing resources, not just materials. Here's the stepwise evolution:

1. **Traditional Inventory & Production Control**
  - Focused on maintaining stock and scheduling production
  - Inventory-heavy, reactive approach
2. **Material Requirement Planning (MRP-I)**
  - Introduced in 1960s–70s
  - Focused on **material planning** based on master production schedule (MPS)
  - Addressed stock-outs and overstock issues
3. **Limitations of MRP-I**
  - Did not consider **capacity constraints** (machines/labor)
  - Ignored financial resource planning

- Limited decision support for management
- 4. **Emergence of MRP-II (1970s–80s)**
  - Integrated **material planning + capacity planning + labor + finance**
  - Enabled **comprehensive production control**
  - Supported **budgeting, costing, and performance analysis**
- 5. **Integration with ERP Systems (1990s onward)**
  - MRP-II concepts incorporated into ERP
  - Provides **real-time resource planning and monitoring**

## **\*ESSENTIAL ELEMENTS OF MRP-II**

MRP-II is a **comprehensive system**, and its **essential elements** are:

### **A. Master Production Schedule (MPS)**

- Defines **what to produce, how much, and when**
- Basis for all subsequent planning

### **B. Bill of Materials (BOM)**

- Hierarchical list of materials, components, and sub-assemblies required per product
- Includes **quantities and levels**

### **C. Inventory Records**

- Accurate information on:
  - Current stock
  - Orders in progress
  - Safety stock
- Prevents overstocking and shortages

### **D. Capacity Requirements Planning (CRP)**

- Checks if **machines, labor, and other resources** are sufficient
- Ensures production schedule is **feasible**

### **E. Shop Floor Control**

- Monitors production progress
- Compares **planned vs actual output**
- Enables **timely corrective actions**

## **F. Financial Data Integration**

- Tracks **budget, costs, and cash flow**
- Ensures production is financially viable

## **G. Feedback and Control System**

- Adjusts future plans based on **actual performance**
- Facilitates continuous improvement

## **H. Computerized System**

- MRP-II relies on **software systems** for complex calculations, data management, and integration
- Provides **real-time planning and decision support**

## **\*Enterprise Resource Planning (ERP)**

**ERP** is a **comprehensive software-based system** that integrates all the **core business processes** of an organization, including:

- Production
- Materials management
- Finance and accounting
- Human resources
- Sales and distribution

Objective: **Streamline processes, improve efficiency, and provide real-time information across the organization.**

## **Definition (Exam-Friendly)**

**ERP is an integrated management system that connects all functional areas of an organization to facilitate real-time data sharing, process automation, and decision-making.**

## **Evolution of ERP**

1. **Traditional Systems**
  - Separate systems for each department
  - Manual or semi-automated, little integration
2. **MRP-I (Material Requirement Planning)**
  - Focused on material planning
3. **MRP-II (Manufacturing Resource Planning)**
  - Integrated materials, capacity, labor, and finance
4. **ERP Systems (1990s onward)**

- Full integration of all organizational processes
- Real-time data, centralized database, and cross-functional reporting

## Essential Features of ERP

1. **Integrated Modules**
  - Connects all departments like finance, HR, production, sales, procurement
2. **Centralized Database**
  - Single source of truth for all data
3. **Real-Time Data Access**
  - Managers can monitor processes instantly
4. **Automation of Processes**
  - Reduces manual errors and duplication
5. **Scalability**
  - Can be expanded to accommodate business growth
6. **Reporting and Analytics**
  - Generates reports for decision-making, planning, and control

## Objectives of ERP

- Improve **efficiency and productivity**
- Ensure **real-time information flow**
- Integrate **all functional areas**
- Facilitate **better decision-making**
- Reduce **operational costs** and manual work

## Advantages of ERP

Advantage	Explanation
Integrated System	All departments use one system
Real-Time Data	Quick, accurate decisions
Process Automation	Less human error, faster workflows
Better Resource Utilization	Optimizes labor, machines, materials
Improved Reporting	Management can analyze trends and costs
Scalability	System grows with business needs

## Limitations of ERP

- High implementation cost
- Complexity in installation and training
- Resistance to change by employees
- Requires accurate and updated data

## ERP vs MRP-II

Basis	MRP-II	ERP
Scope	Manufacturing resources	Entire organization
Modules	Production, materials, finance	Production, finance, HR, sales, procurement
Integration	Limited	Full integration
Decision Support	Focused on production	Organization-wide strategic support
Software	Usually manufacturing-centric	Enterprise-wide ERP software

## \*LEAN ACCOUNTING

**Lean Accounting** is an accounting approach that **supports lean manufacturing principles** by focusing on **value streams** instead of traditional cost centers, standard costs, or departmental reporting.

Objective: **Provide simpler, faster, and more useful financial and operational information to support decision-making in a lean environment.**

### Key Features of Lean Accounting

- 1. Value Stream Costing**
  - Costs are tracked for **value streams** (end-to-end process that delivers value to the customer) rather than individual departments.
- 2. Simplified Reporting**
  - Uses **visual management**, dashboards, and plain-language reports.
- 3. Focus on Decision-Making**
  - Provides **relevant and actionable data** for managers.
- 4. Elimination of Waste in Accounting**
  - Reduces unnecessary reports, reconciliations, and data entry.
- 5. Supports Lean Initiatives**
  - Aligns accounting with **JIT, Zero Inventory, and Continuous Improvement** programs.

### Objectives of Lean Accounting

- Eliminate non-value-adding activities in accounting
- Provide clear and understandable financial information
- Support **lean decision-making**
- Improve **profitability and operational efficiency**
- Align accounting with **lean manufacturing principles**

## Benefits of Lean Accounting

Benefit	Explanation
Simplified Costing	Focus on value streams, not complicated cost allocations
Reduced Accounting Waste	Fewer reconciliations, reports, and manual entries
Faster Decision-Making	Managers get real-time, relevant data
Supports Lean Culture	Encourages continuous improvement
Transparent Financial Data	Easier to understand and communicate

## Difference Between Traditional Accounting and Lean Accounting

Aspect	Traditional Accounting	Lean Accounting
Focus	Departments and cost centers	Value streams
Reporting	Complex, delayed	Simple, timely, visual
Costing	Standard cost, overhead allocation	Direct, value-stream-based
Decision Support	Limited for lean processes	Directly supports lean decisions
Waste	High in reports and reconciliations	Minimizes non-value-added work

## \*BACKFLUSH COSTING

**Backflush Costing** is a **simplified costing system** where costs are **recorded after production is completed**, rather than being tracked at every stage of production.

Objective: **Reduce accounting effort and simplify cost recording in environments with minimal inventory (like JIT).**

**Definition :** Backflush Costing is a costing method in which direct material, labor, and overhead costs are assigned to finished goods only after the production process is complete, eliminating detailed tracking during production.

### Key Features

1. **Post-Production Costing**
  - Costs are assigned **after goods are produced**, not during production.
2. **Minimal Inventory Tracking**
  - Works well in **low WIP or JIT environments**.
3. **Simplified Accounting**
  - Reduces record-keeping for raw materials, WIP, and finished goods.
4. **Use of Standard Costs**
  - Usually, **standard costs** are predefined for materials, labor, and overhead.
5. **Integration with Lean and JIT**

- Commonly used with **JIT, zero inventory, and lean systems.**

### Procedure / Steps in Backflush Costing

1. **Define Standard Costs** for materials, labor, and overhead.
2. **Produce Finished Goods** as per production schedule.
3. **Assign Costs to Finished Goods** using predefined standards.
4. **Adjust Inventory Records** for raw materials and WIP based on production output.

### Advantages of Backflush Costing

Advantage	Explanation
Simplified Accounting	Eliminates detailed tracking of WIP
Reduces Paperwork	Minimal inventory records required
Saves Time	Quick assignment of costs after production
Suited for JIT	Works well in low-inventory environments
Supports Lean Operations	Less focus on non-value-added accounting tasks

### Limitations / Disadvantages

- Not suitable for **high WIP or variable production**
- Relies on **accurate standard costs**
- **Errors are harder to detect** because costs are assigned post-production
- Requires **tight control over inventory and production**

### Difference Between Traditional Costing and Backflush Costing

Aspect	Traditional Costing	Backflush Costing
Cost Tracking	Continuous during production	After production completion
Inventory Records	Detailed for RM, WIP, FG	Minimal
Complexity	High	Low
Best Environment	Any production	JIT, low WIP, lean manufacturing
Adjustments	Frequent	Rare, based on output

### Conditions for Adopting Back flush Costing

Back flush costing works well only under **specific conditions**. These are:

1. **Low Work-in-Progress (WIP) Inventory**
  - Production process is **short and continuous** with minimal WIP.
2. **Just-In-Time (JIT) Production Environment**
  - Materials and components are delivered **only when needed**.

3. **Standardized Production Processes**
  - Uniform processes with **minimal variations** in materials, labor, and overhead.
4. **Use of Standard Costs**
  - Material, labor, and overhead costs are **predefined and fixed**.
5. **Reliable and Accurate Inventory Records**
  - Real-time inventory updates are needed to ensure correct post-production costing.
6. **Few Product Variants / Repetitive Manufacturing**
  - Best for industries with **mass production of similar products**.
7. **Effective Control Systems**
  - Production and inventory must be **closely monitored** to detect errors quickly.
8. **Low Material and Process Complexity**
  - Complicated product structures may make post-production costing **inaccurate**.

## **Different Types of Back flush Costing**

Back flush costing can be applied in **different ways depending on the complexity of the production environment**:

### **A. Simple Back flush Costing**

- Used in **single-stage production** with **direct materials and labor only**.
- Costs are **assigned directly to finished goods** at the end of production.
- Example: Assembly line of identical products.

### **B. Multi-Stage Back flush Costing**

- Applied in **multi-level or multi-stage production**.
- Costs are **flushed at each stage** or assigned to finished goods after the last stage.
- Example: Automobile manufacturing where parts are assembled in stages.

### **C. Hybrid Back flush Costing**

- Combines **traditional costing** for critical or complex items and **back flush costing** for simple or standard items.
- Example: Electronics manufacturing – complex components costed traditionally, standard casings costed via back flush.

## **\*ACCOUNTING FOR VARIANCES**

**Variance accounting** is the process of **analyzing, recording, and reporting differences between standard costs and actual costs** in production.

Objective: **Identify deviations, control costs, and assist management in decision-making.**

### **Definition (Exam-Friendly)**

**Variance accounting is the system of analyzing and recording the differences between standard costs and actual costs to monitor efficiency and control expenses.**

## **Importance of Variance Accounting**

1. **Cost Control** – Highlights areas of overspending or inefficiency.
2. **Performance Measurement** – Evaluates efficiency of departments, employees, and machines.
3. **Decision-Making** – Helps management take corrective actions.
4. **Pricing Decisions** – Provides insight into actual production costs.
5. **Budgeting and Planning** – Improves accuracy of future budgets.

## **Types of Variances**

Variance can be broadly classified into **Material, Labor, and Overhead Variances**:

### **1. Material Variances**

- **Material Cost Variance (MCV)** = Standard Cost – Actual Cost
- **Material Price Variance (MPV)** = (Standard Price – Actual Price) × Actual Quantity
- **Material Usage Variance (MUV)** = (Standard Quantity – Actual Quantity) × Standard Price

### **2. Labor Variances**

- **Labor Cost Variance (LCV)** = Standard Labor Cost – Actual Labor Cost
- **Labor Rate Variance (LRV)** = (Standard Rate – Actual Rate) × Actual Hours
- **Labor Efficiency Variance (LEV)** = (Standard Hours – Actual Hours) × Standard Rate

### **3. Overhead Variances**

- **Variable Overhead Variance**
  - **Spending/Rate Variance** – Difference due to cost per hour of overhead
  - **Efficiency Variance** – Difference due to actual hours used vs standard hours
- **Fixed Overhead Variance**
  - **Budget/Spending Variance** – Difference between budgeted and actual overhead
  - **Volume Variance** – Difference due to actual production units vs standard units

## **Recording Variances in Accounting Books**

1. **Record Actual Cost** – Debit material, labor, and overhead accounts.
2. **Record Standard Cost** – Credit production/finished goods account.
3. **Record Variances Separately** – Debit/credit variance accounts.

### Example Entry for Material Variance:

Material Control A/C	Dr	(Actual Cost)
To Material Price Variance A/C		(Difference due to price)
To Material Usage Variance A/C		(Difference due to usage)
To Cash/Accounts Payable A/C		(Amount Paid)

4. **Close Variances** – At period end, transfer favorable/unfavorable variances to:
  - o Costing Profit & Loss Account
  - o Or directly adjust in Finished Goods / Cost of Production

### Uses of Variance Accounting

- Detect inefficiencies in material, labor, or overhead
- Facilitate cost control and budgeting
- Identify departments or processes needing corrective action
- Support **decision-making for cost reduction and pricing**

### \*DISPOSITION OF VARIANCES

**Disposition of variances** refers to the **treatment of favorable (F) and unfavorable (U) variances** after they have been calculated in variance accounting.

Objective: **Decide whether the variance should be adjusted against production cost, transferred to profit & loss, or analyzed further for control purposes.**

### Types of Variances Based on Disposition

1. **Material Variances**
2. **Labor Variances**
3. **Overhead Variances**

Each type can be **favorable or unfavorable**, and the treatment may vary depending on the organization's policy.

### Methods of Disposition

1. **Adjusting Cost of Production / Finished Goods**
  - o Some companies **absorb variances into the cost of production**.
  - o Example: Material usage variance (favorable) reduces production cost; unfavorable increases it.
2. **Transfer to Profit & Loss Account**
  - o Certain variances, especially **controllable or minor variances**, are **directly written off to P&L**.
  - o Example: Material price variance due to market price fluctuations.
3. **Retain in Separate Variance Accounts**

- Companies may **keep variances in separate ledger accounts** for **management analysis and control purposes**.
- Example: Material, labor, or overhead variance accounts are maintained to analyze efficiency.

### Practical Illustration

Variance Type	Favorable (F)	Unfavorable (U)	Disposition
Material Price	Reduces cost	Increases cost	P&L or adjust FG
Material Usage	Less material consumed	Excess material consumed	Adjust Cost of Production
Labor Rate	Less wages paid	More wages paid	P&L
Labor Efficiency	Less hours worked	More hours worked	Adjust Cost of Production
Overhead	Less overhead absorbed	More overhead absorbed	P&L or adjust FG

### Principles for Disposition

1. **Material & Labor Usage Variances** → Usually **absorbed into production cost**
2. **Material Price & Labor Rate Variances** → Often **charged to P&L**
3. **Overhead Variances** → Depends on whether **controllable (P&L)** or **volume/efficiency (absorbed into production)**

### \*DIFFICULTIES IN BACKFLUSH COSTING

Backflush costing is **simple and time-saving**, but it also has several **limitations and difficulties** in practice:

#### 1. Not Suitable for High Work-in-Progress (WIP)

- Backflush costing assumes **minimal or no WIP**.
- In complex or long production cycles, **tracking costs post-production becomes inaccurate**.

#### 2. Requires Accurate Standard Costs

- Relies heavily on **predefined standard costs** for materials, labor, and overhead.
- Any errors in standards can **misstate the actual production cost**.

### 3. Dependence on Timely and Accurate Inventory Records

- Raw material usage and production output must be **monitored carefully**.
- Delays or errors in inventory updates can lead to **incorrect costing of finished goods**.

### 4. Unsuitable for Customized or Variable Production

- Works best for **mass production of identical products**.
- In industries with **custom orders or variable production**, backflush costing is **difficult to apply**.

### 5. Difficulty in Controlling Overhead Costs

- Overhead allocation is usually **based on standard rates**, not actual consumption.
- Can lead to **distorted cost reporting** for complex overheads.

### 6. Limited Management Control Information

- Provides **less detailed information during production**.
- Managers cannot track **stage-wise efficiency or cost deviations in real-time**.

### 7. Risk of Misstatements

- Since costs are **assigned post-production**, errors or theft may go **undetected until the end**.

### 8. Not Ideal for Multi-Stage Production

- Multi-level manufacturing (e.g., automobiles, electronics) complicates cost tracking.
- Backflush costing may **oversimplify cost allocation**, reducing accuracy.

## \*BACKFLUSH COSTING IN JIT SYSTEM

**Backflush costing** is a simplified costing method where costs are **recorded only after production is completed**.

**JIT (Just-In-Time)** is a production system where materials and components **arrive just when needed**, minimizing inventory.

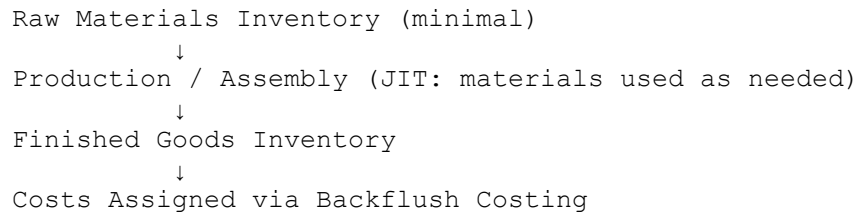
When combined, **Backflush Costing in a JIT system** helps **eliminate detailed tracking of WIP and reduce accounting effort**, as inventory levels are minimal.

### How Backflush Costing Works in JIT

1. **Materials are issued only when needed** → minimal inventory.
2. **Production is completed** → finished goods are recorded.

3. **Costs are “flushed” to finished goods** using **predefined standard costs** for materials, labor, and overhead.
4. **Inventory records** are updated **after production**, not during.

### Flow Chart Example:



### Advantages of Using Backflush Costing in JIT

Advantage	Explanation
Simplified Accounting	No detailed tracking of WIP and materials
Supports Zero Inventory	Works perfectly with JIT’s minimal inventory approach
Saves Time & Reduces Paperwork	Only post-production costing is needed
Quick Costing	Standard costs are applied immediately after production
Enhances Focus on Lean Operations	Accounting aligns with lean and JIT principles

### Limitations / Challenges

Limitation	Explanation
Requires Accurate Standards	Errors in standard costs lead to wrong costing
Not Suitable for Complex Multi-Stage Production	Hard to assign costs accurately if production has many stages
Relies on Timely Inventory Updates	Mistakes in inventory can misstate costs
Less Managerial Control	Limited real-time tracking of efficiency and deviations

## UNIT-3

### **\*PROCESS COSTING**

**Process costing** is a method of **assigning and accumulating costs** to each **process or department** for products that are **mass-produced or continuous in nature**, rather than tracking costs for individual units.

Objective: **Determine the cost per unit when production is continuous and units are homogeneous.**

#### **Key Features**

1. **Continuous Production**
  - Used in industries like **chemicals, cement, steel, textiles, and food processing.**
2. **Homogeneous Products**
  - Products are identical or very similar in nature.
3. **Cost Accumulation by Process**
  - Costs are recorded **for each process or department**, not for individual units.
4. **Average Cost Per Unit**
  - Total costs are divided by the number of units produced to get **unit cost.**
5. **Work-in-Progress (WIP)**
  - Process costing accounts for **partially completed units** using **equivalent units.**

#### **Objectives of Process Costing**

- Determine **accurate unit cost** of production.
- Control and monitor **costs in each process or department.**
- Facilitate **pricing decisions.**
- Assist in **cost comparison and efficiency analysis.**
- Aid in **valuation of inventory and financial reporting.**

#### **Steps in Process Costing**

1. **Identify Processes or Departments** – Each stage of production is considered a cost center.
2. **Accumulate Costs** – Record materials, labor, and overhead for each process.
3. **Calculate Equivalent Units** – Convert partially completed units to full units.
4. **Determine Unit Cost** – Divide total costs by total units (including equivalent units).
5. **Assign Costs to Completed Units and WIP** – Allocate costs to finished goods and remaining WIP.

### Advantages

Advantage	Explanation
Accurate Unit Cost	Calculates precise cost per unit in continuous production
Cost Control	Helps monitor costs by process or department
Facilitates Pricing	Unit cost aids in pricing decisions
Inventory Valuation	WIP and finished goods can be valued systematically
Efficiency Measurement	Identifies high-cost processes for improvement

### Limitations

Limitation	Explanation
Not suitable for heterogeneous products	Works best for uniform, continuous production
Complexity with WIP	Requires careful calculation of equivalent units
Difficult for Irregular Production	Cost allocation becomes complicated
Overhead Allocation	Apportioning overhead may require estimation

### **\*WORK IN PROCESS (WIP)**

**Work in Process (WIP)** refers to **partially completed goods** that are still in the **production process** at the end of an accounting period.

Objective: **Accurately value partially completed units for cost control and financial reporting.**

**Definition** Work in Process (WIP) is the cost of materials, labor, and overhead incurred on products that have started production but are not yet finished.

#### Key Features

1. **Partially Completed Goods**

- Units are neither raw materials nor finished goods.
- 2. **Includes All Production Costs**
  - WIP value includes **direct material, direct labor, and allocated overhead**.
- 3. **Exists in All Continuous Production**
  - Common in **process costing** and **manufacturing industries**.
- 4. **Requires Equivalent Units for Valuation**
  - Partially completed units are **converted into full unit equivalents** for costing.

### Components of WIP

1. **Direct Material Costs** – Cost of raw materials used in production.
2. **Direct Labor Costs** – Wages paid to workers on partially completed goods.
3. **Manufacturing Overhead** – Allocated share of indirect costs like electricity, depreciation, and supervision.

### Objectives of WIP Accounting

- Determine **cost of unfinished goods** at the end of a period.
- Facilitate **accurate unit cost calculation** in process costing.
- Assist in **financial reporting** for inventory valuation.
- Provide data for **production efficiency and cost control**.

### Valuation of WIP

1. **Physical Count** – Count partially completed units.
2. **Estimate Completion Percentage** – Assess how much work is done.
3. **Calculate Equivalent Units** – Multiply partially completed units by % completion.
4. **Assign Costs** – Add material, labor, and overhead proportionally.

### Formula for WIP Value:

$$\text{WIP Value} = \text{Equivalent Units} \times \text{Cost per Unit}$$

$$\text{WIP Value} = \text{Equivalent Units} \times \text{Cost per Unit}$$

### Example

- 100 units in WIP, 60% complete in labor and overhead, 100% complete in materials
- Material cost per unit = \$10, labor per unit = \$5, overhead per unit = \$3

### WIP Value:

- Material =  $100 \times \$10 = \$1000$
- Labor =  $100 \times 60\% \times \$5 = \$300$
- Overhead =  $100 \times 60\% \times \$3 = \$180$

**Total WIP = \$1480**

## Importance in Cost Accounting

- Accurate WIP valuation ensures **correct cost of production and profit measurement**.
- Helps **identify bottlenecks or inefficiencies** in production.
- Provides **control over partially completed goods** and resource usage.

## \*INTER-PROCESS PROFIT

**Inter-Process Profit** arises when **one process or department sells intermediate goods to the next process at a price higher than its cost**, creating an artificial profit **before the product is finished**.

Objective: **Adjust such profits to avoid overstating profit in process costing.**

**Definition** :Inter-Process Profit is the profit included in the cost of intermediate goods transferred from one process to another, which must be eliminated to determine the true cost of production.

### Why Inter-Process Profit Arises

1. **Transfer Pricing** – When intermediate goods are transferred between processes at **selling price instead of cost**.
2. **Departmental Reporting** – Departments may show **profit on internal transfers**, inflating total profit.
3. **Overstatement of Finished Goods Cost** – If not adjusted, the **cost of finished goods includes profit from intermediate processes**.

### Methods of Treatment

There are **two main methods** to deal with inter-process profits:

#### 1. Full Cost Method

- **Transfer at cost + profit** between processes.
- At the end of the process, **inter-process profit is eliminated**.
- Ensures **true cost of production** is reflected.

#### 2. Normal Cost Method

- **Transfer at cost price only**, excluding any profit.
- No need for adjustment at the end.
- Simpler but may **not reflect departmental performance**.

### Journal Entries Example

**Scenario:** Process I transfers goods costing \$10,000 to Process II at a selling price of \$12,000.

### 1. Transfer at Selling Price (with profit):

Process II A/C	Dr	12,000	
To Process I A/C			12,000

### 2. Eliminate Inter-Process Profit at Period End:

Process I A/C	Dr	2,000	
To Inter-Process Profit A/C			2,000

- This ensures that the **final cost of production = actual cost**, not inflated by internal profit.

### Importance of Eliminating Inter-Process Profit

- Prevents **overstating cost of finished goods**
- Provides **accurate unit cost for pricing**
- Ensures **correct profit reporting**
- Facilitates **fair performance evaluation** of each department

## By-Product and Joint Product

### 1. Joint Products

**Joint Products** are two or more products **produced simultaneously from a common input or process** and have **significant relative value**.

#### Definition

**Joint products** are two or more products obtained **simultaneously from the same raw materials or process, which have substantial economic value**.

#### Characteristics

1. Produced **together in a single process**.
2. Have **significant and comparable economic value**.
3. Cannot be produced independently at the joint stage.
4. Cost allocation is needed to determine the **cost of each product**.

#### Example

- Crude oil refining → produces gasoline, kerosene, and diesel.
- Milk processing → produces cream and skimmed milk.

## 2. By-Products

**By-Products** are secondary products **incidentally produced during the manufacture of a main product**, usually with **small or minor value**.

**Definition** :By-products are secondary products obtained incidentally during the production of a main product, having relatively low economic value.

### Characteristics

1. Produced **incidentally** in the manufacturing process.
2. **Low relative value** compared to the main product.
3. Often **sold to reduce overall production cost**.
4. Cost of by-products is usually **credited or treated as miscellaneous income**.

### Example

- Sugar manufacturing → Molasses is a by-product.
- Timber processing → Sawdust is a by-product.

### Differences Between Joint Product and By-Product

Basis	Joint Product	By-Product
Definition	Products of significant value produced simultaneously	Secondary products of minor value produced incidentally
Relative Value	High and comparable	Low compared to main product
Purpose of Production	Produced intentionally	Produced incidentally
Cost Allocation	Allocated using joint costing methods	Often credited against main product cost or treated as income
Examples	Gasoline & Kerosene, Cream & Skimmed Milk	Molasses, Sawdust, Glycerin from soap

### Accounting Treatment

#### Joint Products

- Costs of joint process are **apportioned** among joint products using methods like:
  - **Physical Units Method** (weight, volume, etc.)

- **Sales Value Method** (based on market price at split-off point)
- **Net Realizable Value Method** (estimated selling price – further costs)

### **By-Products**

- Often **not allocated any cost**; proceeds are:
  - **Credited to Production Account**, reducing main product cost, or
  - **Recorded as Other Income**

### **\*UNIFORM COSTING**

**Uniform Costing** is a system where **two or more independent firms or units adopt the same costing principles, procedures, and methods**. This allows **comparison of costs, efficiency, and performance** across similar organizations.

Objective: **Achieve standardization in costing practices for consistency, control, and benchmarking.**

**Definition** :Uniform Costing is a system in which two or more undertakings agree to use the same costing principles, techniques, and methods for the purpose of comparison, control, and coordination.

#### **Need / Importance of Uniform Costing**

1. **Comparison of Costs**
  - Helps compare performance **across units or industries**.
2. **Standardization**
  - Establishes **uniform methods, terms, and accounting practices**.
3. **Cost Control**
  - Facilitates identification of **efficiency improvements** and wastage reduction.
4. **Pricing Decisions**
  - Provides a **basis for uniform pricing** across similar units.
5. **Budgeting and Planning**
  - Helps in **coordinated budgeting and cost forecasting**.
6. **Industry Benchmarking**
  - Enables industries to set **benchmarks for best practices**.
7. **Simplifies Accounting**
  - Reduces **complexity in multi-unit or multi-company organizations**.

#### **Scope of Uniform Costing**

1. **Industries with Multiple Units**
  - Particularly useful in **transport, steel, textile, sugar, and cement industries**.
2. **Cost Control Across Units**

- Helps in monitoring **efficiency, wastage, and productivity**.
- 3. **Inter-Company Comparisons**
  - Enables **comparison of costs, profits, and performance** between similar firms.
- 4. **Decision Making**
  - Facilitates **policy formulation, pricing, and resource allocation**.
- 5. **Standardization of Methods**
  - Uniform methods for:
    - Cost classification (direct, indirect)
    - Cost allocation (overheads, materials)
    - Cost accounting procedures

### Advantages of Uniform Costing

Advantage	Explanation
Facilitates Comparison	Across units or companies
Standardized Practices	Ensures consistency
Helps Cost Control	Identifies inefficiency or wastage
Useful for Pricing	Basis for uniform pricing
Aids Budgeting	Coordinated plans for multiple units
Industry Benchmarking	Encourages best practices

### Limitations

- Requires **cooperation among firms**
- May be **difficult to implement in diverse operations**
- Needs **regular updating of standards**
- Not flexible for **unique or specialized units**

### \*INTER-FIRM COMPARISON

**Inter-Firm Comparison** is the process of **comparing costs, efficiency, and performance of one firm with other firms in the same industry**.

Objective: **Identify best practices, improve efficiency, and control costs across similar firms.**

**Definition :** Inter-Firm Comparison is the systematic comparison of costs, performance, and efficiency of one firm with other firms in the same industry to determine relative efficiency and areas for improvement.

**Objectives of Inter-Firm Comparison**

1. **Cost Control**
  - Identify areas of **high cost or inefficiency**.
2. **Performance Evaluation**
  - Compare **productivity, profitability, and resource utilization**.
3. **Standard Setting**
  - Establish **industry benchmarks and standards**.
4. **Improvement in Efficiency**
  - Encourage firms to adopt **best practices** from competitors.
5. **Pricing Decisions**
  - Helps firms in **competitive pricing** based on industry performance.
6. **Planning and Budgeting**
  - Provides data for **realistic targets and budgets**.

**Methods of Inter-Firm Comparison**

1. **Cost Ratios / Percentage Method**
  - Compare **material, labor, and overhead costs as a percentage of total cost**.
2. **Trend Analysis**
  - Compare **costs or efficiency over time** across firms.
3. **Unit Cost Comparison**
  - Compare **cost per unit of production** between firms.
4. **Statistical Method / Graphical Analysis**
  - Use charts or graphs to highlight **efficiency differences**.
5. **Ratio Analysis**
  - Compare **profit margins, turnover ratios, and productivity ratios** across firms.

**Benefits of Inter-Firm Comparison**

<b>Benefit</b>	<b>Explanation</b>
Identify Best Practices	Learn from more efficient firms
Cost Control	Reduce wastage and improve efficiency
Competitive Advantage	Helps in strategic pricing and production decisions
Benchmarking	Sets standards for performance and costing
Motivation	Encourages managers to improve efficiency

Benefit	Explanation
Planning & Decision Making	Facilitates informed business decisions

### Limitations

- Requires **availability of accurate data from other firms**
- Comparisons may not be valid if **operations or scale differ**
- **Confidentiality issues** may restrict data sharing
- Differences in **accounting methods** may affect comparability

### \*NEED FOR INTER FIRM COMPARISON

In the world of business management, **Inter-Firm Comparison (IFC)** is a technique where the performances, efficiencies, costs, and profits of different firms within the same industry are compared. It acts as a "health check-up" relative to your peers.

The fundamental need for this comparison arises from the fact that internal data alone (intra-firm) cannot tell you if you are truly efficient or just "less bad" than you were last year.

### Key Reasons for Inter-Firm Comparison

#### 1. Identifying "Weak Spots"

A company might think its production cost is optimal because it has decreased by 5% over the last year. However, if the industry average has decreased by 15%, the firm is actually falling behind. IFC helps pinpoint exactly where a firm is lagging—be it in labor productivity, material wastage, or administrative overheads.

#### 2. Establishing Realistic Standards

Standard costing and budgeting often rely on historical data. IFC provides **external benchmarks**, allowing management to set targets based on what the most efficient competitors are actually achieving, rather than just past performance.

#### 3. Improving Profitability and Efficiency

By comparing financial ratios (like Gross Profit Ratio or Return on Capital Employed), a firm can see if its profit margins are "healthy" for its specific sector. It forces a "self-analysis" that leads to:

- **Cost Reduction:** Learning how others keep expenses low.
- **Waste Elimination:** Identifying areas where material or time is being lost compared to industry leaders.

#### 4. Strategic Decision-Making

For investors and top management, IFC provides a clear picture of market positioning. It helps in:

- **Resource Allocation:**
- **Price Fixation:**

#### 5. Benefits for the Industry and Government

- **Prevents Unfair Competition:**
- **Policy Making:** It provides the Government with consolidated industry data to frame fair tax and industrial policies.

#### Essential Pre-requisites

For a comparison to be meaningful, firms usually need to follow **Uniform Costing**. This means they must all agree to:

- Use the same accounting periods.
- Apply the same methods for depreciation and stock valuation.

#### \*REQUIREMENT FOR AN INTER FIRM COMPARISON

To implement an effective **Inter-Firm Comparison (IFC)** system, it isn't enough to simply look at a competitor's balance sheet. There must be a structured framework to ensure that the data being compared is actually "apples to apples."

Here are the essential requirements for a successful Inter-Firm Comparison:

##### 1. Establishment of a Central Body

A neutral, third-party organization (such as a Trade Association or a Research Institute) is required to act as the data clearinghouse.

- **Purpose:** To collect data, analyze it, and disseminate reports.
- **Trust:** It ensures that sensitive data from Firm A is not leaked directly to Firm B, maintaining **confidentiality** through the use of code names or masked IDs.

##### 2. Adoption of Uniform Costing

This is the most critical technical requirement. For comparisons to be valid, all participating firms must use the same accounting principles.

- **Methods:** Consistent methods for depreciation (e.g., Straight Line vs. Written Down Value).
- **Valuation:** Uniform inventory valuation (e.g., FIFO vs. Weighted Average).
- **Classification:** Agreement on which costs are "Direct" versus "Overhead."

### 3. Organizational Similarity

While firms don't have to be identical, they should share a basic level of comparability to make the data meaningful:

- **Size and Scale:** Comparing a multinational corporation to a local family-run shop provides little actionable insight.
- **Nature of Product:** Firms should produce similar goods or services.
- **Geographical Factors:** Comparisons are most accurate when firms operate under similar economic conditions (tax laws, labor costs, etc.).

### 4. Definition of Comparative Units

The "metrics" or Key Performance Indicators (KPIs) must be clearly defined and agreed upon by all members. Common units include:

- **Financial Ratios:** Return on Investment (ROI), Current Ratio, and Debt-Equity Ratio.
- **Operating Ratios:** Labor turnover rate, machine utilization percentage, and cost per unit.

### 5. Information Sharing and Transparency

Firms must be willing to share honest, accurate data with the Central Body.

- **Promptness:** Data must be submitted on time so that the resulting reports are current and relevant to the market.
- **Consistency:** Data must be collected over several periods (years) to identify trends rather than one-off anomalies.

## \*TYPES OF COMPARISION

When we talk about Inter-Firm Comparison, we aren't just looking at the bottom line. To get a 360-degree view of where a business stands, the comparison is usually broken down into four distinct categories.

### 1. Financial Comparison

This is the most common type and focuses on the "wealth" and "health" of the firms. It uses data from the Balance Sheet and Profit & Loss account.

- **Key Metrics:** Return on Capital Employed (ROCE), Debt-to-Equity ratio, and Liquidity ratios.

- **Goal:** To see if the firm is generating as much profit per dollar invested as its competitors.

## 2. Cost Comparison

This dives deeper into the "Uniform Costing" mentioned earlier. It breaks down the total cost of production to see where money is being spent (or wasted).

- **Key Metrics:** Cost of raw materials, direct labor costs, and factory overheads per unit.
- **Goal:** To identify if a competitor has a "cost advantage" because they buy materials cheaper or use labor more efficiently.

## 3. Technical (Operational) Comparison

This moves away from the accounting office and onto the factory floor. It measures physical efficiency rather than just monetary value.

- **Key Metrics:** Machine downtime, units produced per man-hour, and percentage of defective goods (rejection rate).
- **Goal:** To determine if the firm's technology or production processes are outdated compared to industry leaders.

## 4. Sales and Distribution Comparison

Even if you produce a product efficiently, you have to sell it effectively. This type of comparison looks at the "market-facing" side of the business.

- **Key Metrics:** Marketing expense as a percentage of sales, sales per representative, and distribution costs per kilometer.
- **Goal:** To evaluate the effectiveness of the sales force and the efficiency of the supply chain.

## UNIT-4

### \*COST RECORDS

**Cost Records** are the formal documents and books maintained by a company to track the expenditure involved in manufacturing a product or providing a service.

Without accurate and standardized cost records, any attempt at comparison becomes guesswork.  
The Purpose of Cost Records

Cost records serve as the "raw data" for the comparison process. Their primary functions include:

- **Cost Ascertainment:** Determining the actual cost of a specific product, job, or process.
- **Cost Control:** Comparing actual spending against budgeted standards to find variances.
- **Price Fixation:** Providing a logical basis for setting selling prices.

### Essential Components of a Cost Record

To be useful for Inter-Firm Comparison, cost records must be broken down into specific categories:

#### 1. Material Records

Tracks the quantity and value of raw materials.

- **Documents:** Purchase Requisitions, Goods Received Notes (GRN), and Material Requisition Notes.
- **Comparison Point:** Are we paying more for the same raw material than our competitors?

#### 2. Labor Records

Tracks the time spent by workers and the resulting wages.

- **Documents:** Time Cards, Job Sheets, and Payroll Summaries.

- **Comparison Point:** Is our "idle time" or "overtime" significantly higher than the industry average?

### 3. Overhead Records

Tracks indirect expenses that aren't easily tied to a single unit.

- **Categories:** Factory overheads (rent, power), Administrative overheads (office salaries), and Selling/Distribution overheads (ads, freight).
- **Comparison Point:** Are our administrative costs bloated compared to similar-sized firms?

#### Statutory Requirements (The Legal Side)

In many jurisdictions (like India under the Companies Act), certain industries are **legally mandated** to maintain cost records. This ensures:

- **Transparency:** Prevents companies from hiding inefficiencies.
- **Auditability:** Allows a "Cost Audit" to verify that the records represent a true and fair view of the cost of production.

#### Cost Records vs. Financial Records

While financial records (Trading/P&L) show *what* happened, cost records show *why* it happened.

Feature	Financial Records	Cost Records
<b>Objective</b>	Shows overall profit/loss and financial position.	Shows cost per unit and process efficiency.
<b>Users</b>	External (Investors, Tax authorities).	Internal (Management, Central Body for IFC).
<b>Analysis</b>	Aggregated data (Total Salaries).	Granular data (Labor cost per unit).

#### \*INTEGRAL SYSTEM

**Integral System** (also known as **Integrated Accounting**) is a system where both cost and financial accounts are maintained in a **single set of books**.

Unlike a non-integral system (where cost and financial accounts are kept separate and eventually reconciled), an integral system uses a unified ledger to record all transactions.

### **Key Characteristics**

- **Single Ledger:** There is no need for a separate "Cost Ledger" and "Financial Ledger." One set of books serves both purposes.
- **No Reconciliation:** Since there are no separate profit figures, the time-consuming process of reconciling "Costing Profit" with "Financial Profit" is eliminated.
- **Complete Record:** Every transaction is recorded using a double-entry system that captures both the functional (cost) and the objective (financial) nature of the expense.

### **How it Works (The Ledger Structure)**

In an integral system, you don't use a "General Ledger Adjustment Account." Instead, you use standard financial accounts alongside cost accounts.

### **Typical Accounts in an Integral System:**

1. **Stores Ledger Control Account:** For raw materials.
2. **Work-in-Progress (WIP) Control Account:** For production in stages.
3. **Finished Goods Control Account:** For completed inventory.
4. **Wages Control Account:** For labor costs.
5. **Fixed Assets & Cash/Bank:** Standard financial accounts.

### **Advantages of an Integral System**

- **Accuracy and Speed:** Data is recorded once. This reduces clerical errors and ensures that information is available to management faster.
- **Cost Efficiency:** Maintaining one set of books requires fewer staff and less physical/digital storage than maintaining two separate systems.
- **No Discrepancies:** You avoid the headache of having two different profit figures at the end of the year caused by different valuation methods for stock or overheads.
- **Holistic View:** It provides a "single source of truth" for both the factory manager (cost-focused) and the CFO (finance-focused).

### **Requirements for Implementation**

To make an Integral System work (especially for **Inter-Firm Comparison**), a firm needs:

1. **A Unified Chart of Accounts:** A clear coding system that identifies whether an expense is direct, indirect, capital, or revenue.
2. **Agreed Valuation Rules:** A fixed policy on how to value stock and depreciation, as these will affect both the balance sheet and the cost per unit simultaneously.
3. **Coordinated Staff:** The accounting team must understand both cost principles and financial reporting standards.

## Integral vs. Non-Integral: At a Glance

Feature	Integral System	Non-Integral System
<b>Ledgers</b>	One unified set of books.	Two separate sets of books.
<b>Profit Figure</b>	Only one profit figure is calculated.	Two different profit figures are calculated.
<b>Reconciliation</b>	Not required.	Essential to explain the difference in profit.
<b>Cost Maintenance</b> of	Lower (less duplication).	Higher (duplicate entries).

### \*PREPARING ACCOUNTS UNDER AN INTEGRAL SYSTEM

Preparing accounts under an **Integral System** involves a specialized workflow where transactions flow seamlessly from purchase to production, and finally to the income statement, all within one ledger.

To set this up, you must follow a specific sequence of entries that link the "Factory" (Costing) and the "Office" (Finance).

#### 1. The Pre-requisites

Before recording transactions, two things must be established:

- **Unified Chart of Accounts:** Every account is assigned a unique code. For example, Account 400 might be "Raw Materials" (Costing) and Account 100 might be "Bank" (Finance).
- **Integrated Journal:** A single journal where a transaction like "Cash Purchase of Material" is recorded as:
  - *Debit:* Stores Ledger Control A/c
  - *Credit:* Cash/Bank A/c

#### 2. Key Ledger Accounts (The Flow)

In an integral system, the accounts act as a "pipeline." Data flows through them in this order:

1. **Stores Ledger Control A/c:** Records all movements of raw materials.
2. **Wages Control A/c:** Records total wages paid and allocates them to production.
3. **Overhead Control Accounts:** Separate accounts for Factory, Administration, and Selling expenses.
4. **Work-in-Progress (WIP) Control A/c:** The "heart" of the system where materials, labor, and overheads meet.
5. **Finished Goods Control A/c:** Where the cost of completed items is stored.
6. **Cost of Sales A/c:** Records the cost of goods actually sold to customers.

### 3. Standard Journal Entries

Here is how the preparation actually looks in the books:

<b>Transaction</b>	<b>Debit Account</b>	<b>Credit Account</b>
<b>Purchase of Material</b>	Stores Ledger Control	Bank / Creditors
<b>Issue of Direct Material</b>	WIP Control	Stores Ledger Control
<b>Payment of Wages</b>	Wages Control	Bank
<b>Direct Labor Allocated</b>	WIP Control	Wages Control
<b>Factory Overheads Incurred</b>	Factory Overhead Control	Bank / Outstanding Exp.
<b>Absorption of Overheads</b>	WIP Control	Factory Overhead Control
<b>Completion of Production</b>	Finished Goods Control	WIP Control
<b>Cost of Goods Sold</b>	Cost of Sales	Finished Goods Control

### 4. Closing the Accounts (The Final Step)

At the end of the period, the preparation concludes with the **Profit & Loss Account**:

- **Sales:** Credited to the P&L Account (from the Bank/Debtors entry).
- **Cost of Sales:** Debited to the P&L Account.
- **Closing Stock:** The balances remaining in the Stores, WIP, and Finished Goods accounts are carried forward to the Balance Sheet.

Because there is only one P&L account, the resulting figure is your **final net profit**—no reconciliation is needed.

### **Why this matters for Inter-Firm Comparison**

When firms use an integral system, their data is more "audit-ready." The central body can trust that the **cost per unit** reported is tied directly to the **actual cash spent** in the financial books, making the comparison highly reliable.

## **\*PREPARATION OF ACCOUNT UNDER NON INTEGRAL SYSTEM**

In a **Non-Integral System** (also known as a Cost Ledger Accounting System), the cost accounts and financial accounts are kept in **two separate sets of books**.

Because these systems operate independently, the cost accounts require a special "balancing" account to represent the financial ledger. This is called the **General Ledger Adjustment (GLA) Account** (or Cost Ledger Control Account).

### **1. The Structure: The "Mirror" Effect**

In the cost books, every transaction that involves an outside party (like paying cash or buying from a creditor) cannot be recorded in a "Bank" or "Creditor" account because those accounts only exist in the **Financial Books**.

Instead, the cost books use the **General Ledger Adjustment Account** as a substitute for all financial accounts.

### **2. Key Ledger Accounts Required**

To prepare accounts under this system, you must maintain several "Control Accounts" in the Cost Ledger:

- **Stores Ledger Control A/c:** Records all material transactions.
- **Wages Control A/c:** Records total labor costs.
- **Factory/Admin/Selling Overhead Control A/cs:** Records indirect expenses.
- **Work-in-Progress (WIP) Control A/c:** Accumulates production costs.
- **Finished Goods Control A/c:** Holds the cost of completed stock.
- **Cost of Sales A/c:** Records the cost of goods sold.

- **Costing Profit & Loss A/c:** Determines profit based on costing data.

### 3. Standard Journal Entries (Non-Integral)

Notice how the **GLA Account** is used whenever money or an external party is involved:

Transaction	Debit Account	Credit Account
<b>Purchase of Material</b>	Stores Ledger Control	<b>General Adjustment</b> <b>Ledger</b>
<b>Payment of Wages</b>	Wages Control	<b>General Adjustment</b> <b>Ledger</b>
<b>Direct Material Issued</b>	WIP Control	Stores Ledger Control
<b>Overheads Incurred</b>	Overhead Control	<b>General Adjustment</b> <b>Ledger</b>
<b>Overheads Absorbed</b>	WIP Control	Overhead Control
<b>Goods Completed</b>	Finished Goods Control	WIP Control
<b>Cost of Goods Sold</b>	Cost of Sales	Finished Goods Control
<b>Sales (at cost)</b>	<b>General Adjustment</b> <b>Ledger</b>	Cost of Sales

### 4. The Final Step: Reconciliation

This is the most distinct part of the preparation. Because the cost books use different rules (e.g., overhead absorption rates instead of actual spend), the **Costing Profit** will almost never match the **Financial Profit**.

At the end of the period, you must prepare a **Reconciliation Statement** to account for differences like:

- **Under/Over Absorption** of overheads.
- **Different Valuation** of closing stock.
- **Purely Financial Items** (like interest received or dividend payments) that appear in financial books but are ignored in cost books.

### \*BENEFITS AND LIMITATION OF INTEGRAL AND NON INTEGRAL SYSTEM

Choosing between an **Integral** (unified) and **Non-Integral** (separate) system is a strategic decision. While the Integral system is modern and streamlined, the Non-Integral system offers a layer of specialized detail that some large-scale industries still prefer.

### **Integral Accounting System**

*Unified books where cost and financial data live together.*

#### **Benefits**

- **Efficiency:** Data is entered once. This eliminates duplicate clerical work and reduces the cost of maintaining the accounting department.
- **No Reconciliation Required:** Since there is only one profit figure, management doesn't waste time explaining why the "costing profit" differs from the "financial profit."
- **Speed:** Closing the books at the end of the month or year is much faster, providing real-time data for decision-making.
- **Accuracy:** Automatic coordination between the two sets of data reduces the risk of overlooking expenses.

#### **Limitations**

- **Complexity:** Setting up a unified "Chart of Accounts" that satisfies both the factory manager and the tax auditor can be difficult.
- **High Initial Cost:** Implementing integrated software (like advanced ERP systems) and training staff requires a significant investment.
- **Loss of Detail:** In some cases, specific costing details (like minute machine-hour data) might be "summarized away" to fit into the financial reporting format.

### **Non-Integral Accounting System**

*Independent books for cost and finance, linked by a Reconciliation Statement.*

#### **Benefits**

- **Specialization:** The cost department can use different valuation methods (like "Replacement Cost" or "Standard Costing") that wouldn't be allowed in financial reporting.
- **Confidentiality:** Financial data (like executive salaries or dividends) can be kept separate from the cost records that factory-level staff might see.
- **Detailed Cost Control:** Because the cost accounts are independent, they can be as granular and detailed as the production manager needs without "cluttering" the financial ledger.

## Limitations

- **Clerical Effort:** Every transaction must essentially be recorded twice (once in each ledger), leading to higher administrative costs.
- **Reconciliation Headaches:** Significant effort is required to prepare a Reconciliation Statement to explain the differences in profit caused by stock valuation, overhead absorption, and interest.
- **Risk of Errors:** Discrepancies between the two sets of books are common and can lead to confusion if not managed strictly.

## At a Glance: Which one to choose?

Feature	Integral System	Non-Integral System
<b>Best For</b>	Modern firms using ERPs (SAP/Oracle).	Large firms with highly complex factory operations.
<b>Effort</b>	Low (Single entry).	High (Double entry + Reconciliation).
<b>Audit</b>	Easier for external auditors.	Easier for specialized cost auditors.
<b>Reliability</b>	High (No conflicting profits).	Moderate (Requires periodic verification).

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