Draft Study Material
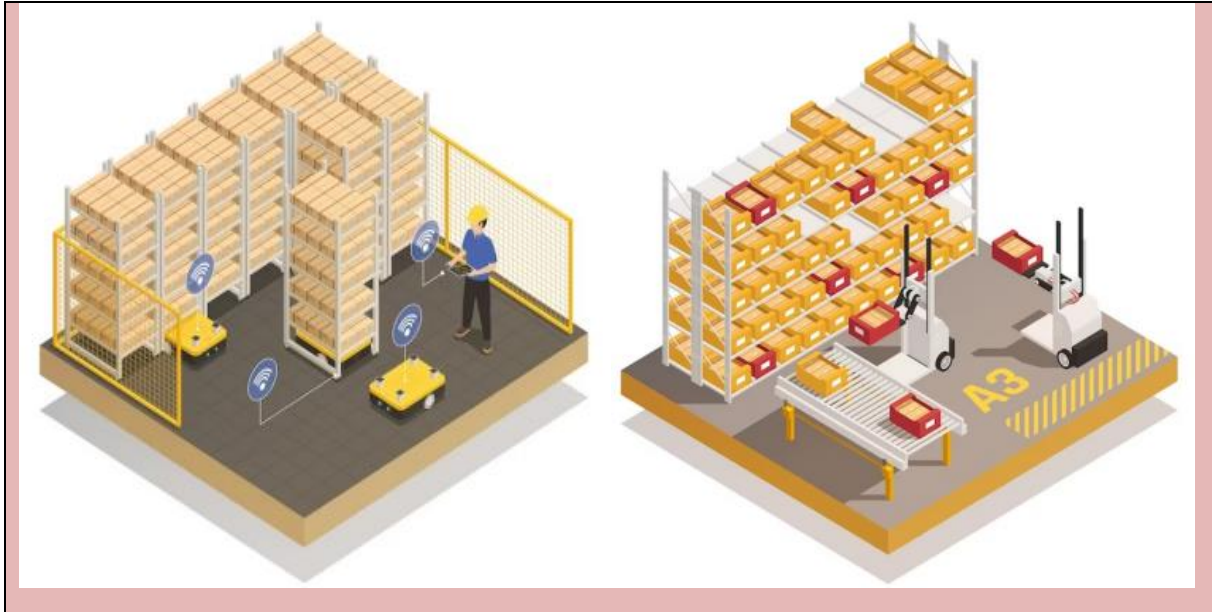

WAREHOUSE ASSOCIATE

(QUALIFICATION PACK: Ref. Id. LSC/Q0101)

Sector: Logistics

(Grade-X)

PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION

(a constituent unit of NCERT, under MHRD, Government of India)
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Preface

Vocational Education is a dynamic and evolving field, and ensuring that every student has access to quality learning materials is of paramount importance. The journey of the PSS Central Institute of Vocational Education (PSSCIVE) toward producing comprehensive and inclusive study material is rigorous and time-consuming, requiring thorough research, expert consultation, and publication by the National Council of Educational Research and Training (NCERT). However, the absence of finalized study material should not impede the educational progress of our students. In response to this necessity, we present the draft study material, a provisional yet comprehensive guide, designed to bridge the gap between teaching and learning, until the official version of the study material is made available by the NCERT. The draft study material provides a structured and accessible set of materials for teachers and students to utilize in the interim period. The content is aligned with the prescribed curriculum to ensure that students remain on track with their learning objectives.

The contents of the modules are curated to provide continuity in education and maintain the momentum of teaching-learning in vocational education. It encompasses essential concepts and skills aligned with the curriculum and educational standards. We extend our gratitude to the academicians, vocational educators, subject matter experts, industry experts, academic consultants, and all other people who contributed their expertise and insights to the creation of the draft study material.

Teachers are encouraged to use the draft modules of the study material as a guide and supplement their teaching with additional resources and activities that cater to their students' unique learning styles and needs. Collaboration and feedback are vital; therefore, we welcome suggestions for improvement, especially by the teachers, in improving upon the content of the study material.

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MODULE 1 | HANDLING OF PERISHABLE GOODS

Module Overview

In a world where c Sorting And Grading Operations In Cold Chain on venience and efficiency often dictate our choices, it's easy to overlook the delicate dance that takes place behind the scenes—the careful handling of perishable goods. From the crispness of a freshly harvested apple to the succulent aroma of a just-caught fish, our lives are enriched by the bounty of perishable items. Yet, ensuring their quality and safety requires a level of knowledge and attention that often goes unnoticed.

It is the duty of Warehouse assistant to perform basic activities like picking up the goods, packing them, labeling them, kitting and binning of goods, and loading & unloading from trucks in a warehouse. Warehouse assistant operates the basic activities whether manual or with the help of battery operated pallet truck or material handling equipment. They also engage in counting of inventory and maintaining warehouse work area clean.

Warehouse assistant can handle perishable goods in warehouse with the help of Personal Protective Equipment (PPE) like gloves, jackets, shoes, etc., Material Handling Equipment (MHE) like forklift, reach stacker, pallet truck, etc., barcode scanner, packing devices, packing material, markers and stationery, etc.

Apart from the basic activities, warehouse assistant is also responsible for various activities like; identifying and complying with various coding of perishables goods stored in warehouse, maintaining ambient temperature as per product, following handling precautions as per Standard Operating Procedures (SOP) for various perishable products, performing sorting and grading of perishable goods as per SOP and customer standards, identifying goods to be moved either to the storage from the staging area/unloading area, identifying the right equipment required for handling the goods, making arrangement for equipment/tools such as pallets, reach stack, fork lift, PPE, etc. according to the type of product, operating MHE or use MHE operator to pick the items, loading finished pallets of products onto assigned trailers safely and accurately, identifying contaminated goods and quarantine them as per SOP, cleaning and maintaining warehouse aisles and product slots and removing product from slots with the use of a pallet jack.

The unit is about handling perishable goods such as fruits, vegetables, and other temperature and time sensitive goods in a warehouse. Most importantly, however, you need to make sure everyone handling perishable food knows how to do so properly throughout the process. The unit will focus on handling of perishable goods at warehouse. The first session covers the

Perishable Goods & it's Types, the second session covers the Sorting & Grading Operations, the third session describes about the Material Handling Equipment & its Usage, and the fourth session discusses about the Contamination Goods & Procedure of Quarantine of goods in Warehouse.

Learning Outcomes

After completing this module, you will be able to:

- Understand the characteristics, storage requirements, and management practices for perishable goods to ensure their quality and safety.
- Learn sorting and grading methods to ensure product quality.
- Know the equipment and its usage for efficient cold chain management.
- Understand the isolation and management procedures for contaminated goods.

Module Structure

Session 1: Perishable Goods

Session 2: Sorting and Grading Operations in Cold Chain

Session 3: Material Handling Equipment and Usage in Cold Chain

Session 4: Contaminated Goods and Procedure of Quarantine

Session 1: Perishable Goods

Perishable goods are products which have an expiration date. If these food items are not consumed in a certain time period, it will be spoil. Goods like; milk, cheese, leafy vegetables, meat, etc., are all perishable goods (Fig. 1.1). Perishable goods can be kept at room temperature to prevent from spoilage only for few hours or 1 to 2 days.

For example- dairy products, meat, fish, poultry, leafy vegetables and fruits, processed cooked food. These goods must be kept under refrigeration at household as well as commercial level.

Fig. 1.1: Perishable Goods

In general, the most perishable goods contain a high level of protein or have moisture and carbohydrates in them. Special methods are used to preserve perishable goods. The rate of spoilage varies with the temperature, moisture and or dryness of the environment. Storage of perishable goods should be done carefully otherwise it will be spoiled.

Types of Perishable Goods

Following are the main categories of perishable goods:

Dairy products: Milk, curd and cream come under the category of dairy products. These are the basic goods for any consumer but their life is very short. There are various variety of milk available in the market such as- Toned milk (no cream) and buffalo milk (full cream).

Vegetable & Fruit products: Vegetables and fruits should be clean, fresh, firm and crisp. Some fruits are heavy with thin skin, are juicy and of good quality. One should purchase only as much as required for the daily sales. Vegetables and fruits should be store in a cool, dry place. To keep vegetable fresh for longer time one should store vegetables, like cauliflower and radish, with leaves (Fig. 1.2). Keep leafy vegetables wrapped in a moist cloth. Do not wash fruits before storing as they spoil faster. Keep cabbage and cucumber in 2-3 folds of newspaper or brown paper.

Fig.1.2: Vegetables & Fruits Products

Bakery Products: Under the category of bakery product bread is the most used item as perishable goods. The life of bread is just 1-2 days only. It must be kept in air tight container so that it remains fresh and kept in a cool place or refrigerator.

Eggs: Egg is a good source of protein and widely used non vegetarian food. Its demand is always high. Never wash eggs before storing. Eggs must be stored with their pointed ends downwards. Must be stored in a cool place or in a basket in an airy room.

Meat, Fish and Chicken: Fresh meat is always pink in color. Meat should be firm, yet soft and have a smooth surface. Always store meat, fish and chicken in a cool place or in refrigerator.

Role of individuals in the workflow for handling perishable goods

A Warehouse Associate receives and processes incoming perishable goods and organises perishable products as per warehouse policy. He/she can look after the activities of load and unload goods trucks and move perishable goods within the warehouse. It requires carrying and pushing heavy weight items by operating hand trucks, forklifts, hoists, motorised conveyers or other heavy machinery.

Warehouse Associate is a trained person, one who is responsible for handling perishable goods in warehouse. He/she looks after the activities like receiving of goods, processing of goods and storing the goods according to purchase orders and store policy. They also ensure that shipping schedules are met with attention to detail to ensure timely delivery and loss prevention.

The role of an individual is to performs basic activities in warehouse for the

management of perishable goods like picking, packing, labeling, kitting and binning, loading and unloading of goods. Warehouse associate will operate battery operated or manual pallet and truck for the movement of perishable goods. He/she also engages in counting of inventory and maintaining cleanliness of warehouse work area. The key objective of this position is responsible for managing the complete cycle of movement of material from unloading from inbound vehicle till loading onto outbound vehicle. Warehouse associate plays a very important role in flow of perishable goods, which are as follows:

- Warehouse associate should be physically and medically fit to undertake a warehouse operation like long hours of active material movement on floor.

- He/she should be observant, diligent and have basic mathematical ability to count the number of boxes.

- He/she should communicate effectively in regional language.

- Warehouse associate should focus on processing and packaging of goods and shipping the orders accurately.

- He/she should arrange the stocks and maintain goods inventory.

- He/she should inspect products carefully and identify the defects and damages.

- He/she should look at the incoming and outgoing shipments.

- He/she should design the warehouse layout and manage warehouse space.

- He/she should receive goods, unload the trucks and place incoming items appropriately.

- He/she should receive the invoice, check and verify invoice and fill customer invoices.

- He/she should abide by all company safety and hygiene regulations.

- He/she should contribute ideas to optimise warehousing procedures.

- He/she should keep warehouse clean on daily basis.

Warehouse associates are a vital part of the supply chain process. They manage movement, material and method and make sure warehouse productivity targets are met. The foremost important job of warehouse associate is to prepare for the day's work by getting the job allocation from the supervisor and planning the activities for the day.

Procedures to be followed for handling perishable goods

The warehouse handling process of perishable goods must be complying with very strict and specific characteristics to ensure their accurate preservation throughout supply chain. These characteristics make it a complex type of product in terms of logistics management.

Firstly, perishable products describe their physical composition and characteristics like expiration or ruin rapidly. Perishable goods also lose their original properties due to peripheral factors like dampness, hotness or environmental pressure.

Various foods are perishable products such as daily products, oils, meat, fish fruit, prepared foods, leafy vegetables and juices. Outside of food, fresh flowers and plants are also considered perishable products. Another range of foods which only need good air and humidity quality are considered semi-perishable goods include some vegetables, nuts and tubers.

In addition, some medical, pharmaceutical products, chemical materials and natural resins are also perishable products.

Coding system followed to label items

Product code is a unique identifier, assigned to each product which is ready, to be marketed or for sale. Product code in India could mean the following:

1. Universal Product Code (UPC), a code which is generally used for FMCG products such as butter, cheese and others.

2. HSN code used for export, imports and GST calculations.

3. Material code used for ERP purposes.

Universal Product Code

Universal Product Code (UPC) is generally assigned to packaged products. Universal Product Code is made of 12 numeric digits that are uniquely assigned to any product. UPC number (Fig. 1.3) and bar code appears on the product and mainly used for scanning of items at the point of sale at retailer's counter.

Fig. 1.3: Universal Product Code

Material Code

Material code is the unique number assigned to each product or SKU in the Enterprise Resource Planning like SAP. Every company deals with multiple products. It assigns a unique number of each of its product so that it can easily identify the product; manage its stock levels, and issue purchase & sales orders using that code.

FDA Product Code

Food and Drug Administration, suggests product code as a combination of five to seven numbers and letters. The string of letters and numbers represents five components:

1. Industry code
2. Class
3. Subclass
4. PIC or Process Indicator Code
5. Product (Group)

Basics of ERP (Enterprise Resource Planning) system of the organisation for coding

Enterprise Resource Planning is a software system which helps organisations manage core business process automatically for best performance. It is system software of organisation used to flow data between company's business processes. It provides single source of data to streamlining operations across enterprise.

ERP software system maintain company operations like financials operations, supply chain operations, commerce activities, manufacturing and reporting activities, human resources operations on one platform.

Each and every ERP system requires customised coding to meet exclusive business requirements which can be slow or even prevent the acceptance of new technology or process optimisation.

What makes today's ERP software that it brings all processes at one fluid system? It not only offers data connectivity within ERP system (Fig. 1.4), but also provide e-commerce facility, customer engagement and productivity related solutions. It also enables to connect all the organisation data for better insights that help warehouse associate to optimise processes across entire business.

Fig. 1.4: ERP System

Adding to this modern ERP solution provides flexible options, privacy, sustainability, improved security, low-code customization, etc. But the best thing is that it builds stability into the business and processes through innovative ways of completing the work and brings it to the next level.

Today's warehouse owners face many challenges, and an ERP system provides a complete, Omni-channel commerce solution that unifies warehouse works and rich experience.

Activities

Activity 1: Prepare a chart showing various coding of perishables goods stored in warehouse.

Material Required: Note Book, Pen/Pencil, Check list, Sheet, and Color Pencil.

Procedure:

1. Visit a warehouse along with peers.

2. Meet the warehouse associate and others and greet them.

3. Take a round of the warehouse and enquire from the manager about the following:

   a) Suppliers of perishable goods and their coding.

   b) Storage of perishable goods with their coding.

   c) Receiving of perishable goods and their locations of their storage with

code.

d) Loading of perishable goods as per their coding.

4. Discuss with the warehouse associate about supply chain practices.

5. Show your notes to the warehouse associate and confirm.

6. Prepare a report and discuss with friends and show it to the teacher.

7. Discuss your report in the class.

Activity 2: Visit to a warehouse to understand the equipment required for handling the perishable goods.

Material Required: Note Book, Pen/Pencil and Checklist.

Procedure:

1. Visit a warehouse along with peers.

2. Meet the warehouse associate and other employees in the warehouse.

3. Take a tour and enquire to warehouse associate about the following:

   a) What are the material handling equipment for perishable goods?

   b) Is handling of perishable goods different from handling of other goods?

   c) Feature of material handling equipment for perishable goods.

   d) What is the right equipment for movement of perishable goods?

   e) Distribution of perishable goods as per their nature.

4. Discuss with the warehouse associate about how to handle the perishable goods.

5. Show your notes to the warehouse associate and confirm.

6. Prepare a report and discuss with friends and show it to the teacher.

7. Discuss your report in the class.

Activity 3: Have a discussion containing precautions as per Standard Operating Procedures (SOP) for handling various perishable products.

Material required: Check list, Notepad, pen/pencil, etc.

Procedure:

1. Collect the materials about the precautions as per Standard Operating Procedures (SOP) for handling various perishable products.

2. Have a discussion among students in the presence of subject teacher about the precautions as per Standard Operating Procedures (SOP) for handling various perishable products.

a) Temperature Control
b) Proper Packaging
c) Quick Unloading and Staging
d) Regular Inspections
e) Hygiene and Cleanliness

3. Subject teacher must correct if found something wrong in the discussion in the class.

4. Ensure about corrections.

5. Write the conclusion.

Activity 4: Prepare a chart of safety standards and security procedures to be followed while handling perishable goods.

Material required: Check list, Notepad, pen/pencil, drawing sheet, color pencils.

Procedure:

1. Collect the materials required to draw the chart on safety standards and security procedures to be followed while handling perishable goods.

2. Draw a chart containing safety standards and security procedures to be followed while handling perishable goods in warehouse and correlate it with logistics industry.

   a) First-In, First-Out (FIFO) Method
   b) Adequate Ventilation
   c) Monitoring and Recording
   d) Staff Training

   e) Emergency Protocols

3. Check it from the textbook and from what teacher taught in the class.

4. Ensure about your work completion.

5. Discuss with the classmates in front of your teacher.

6. Write the conclusion.

Check your Progress

A. Fill in the Blanks

1. Perishable goods are products which have an _____date.
2. The _____varies with the temperature, moisture and or dryness of the environment.
3. Keep leafy vegetables wrapped in a _____cloth.
4. Fresh meat is always _____ in color.

5. _____is a unique identifier, assigned to each product which is ready, to be marketed or for sale.

6. Universal Product Code (UPC) is generally assigned to_____ products.

7. _____code is the unique number assigned to each product.

B. Multiple Choice Questions

1. The most perishable goods contain a high level of _____

   a) protein
   b) moisture
   c) carbohydrates
   d) all the above

2. Under the category of dairy product_____

   a) Milk
   b) Curd
   c) Egg
   d) Both (a) and (b).

3. Under the category of bakery product _____is most used item as perishable goods.

   a) Bread
   b) Butter
   c) Milk
   d) Vegetables

4. Warehouse associate should be _____

   a) Physically and Medically Fit
   b) Observant and Diligent
   c) Effective in communication
   d) All The Above

5. Perishable goods also lose their original properties due to peripheral factors like _____

   a) Dampness
   b) Hotness
   c) Environmental Pressure
   d) All the above

6. ERP software system maintain the company operations like _____ on one platform

   a) Financials operations
   b) Supply chain operations
   c) human resources operations

       d) All the above

7. A cold chain or cool chain is a controlled supply chain _____

    a) Temperature
    b) Monitor
    c) Environment
    d) None of the above

8. Air cargo comprises of

    a) Air Freight
    b) Air Express
    c) Airmail
    d) All the above

C. State whether the following statements are True or False

1. Storage of perishable goods should be done carefully otherwise it will be spoiled.
2. Do not wash fruits before storing as they spoil faster.
3. Always store meat, fish and chicken in a hot place or outside refrigerator.
4. Warehouse Associate is a trained person one who is responsible for handling perishable goods in warehouse.
5. Vegetable and fruits are perishable goods.

D. Short Answer Questions

1. Define perishable goods.
2. Who is a warehouse associate?
3. What is material code?
4. What is ERP?

E. Long Answer Questions

1. Explain various types of perishable goods.
2. Discuss the role of warehouse executive.
3. Explain the basics of ERP.

F. Check Your Performance

1. Draw a flow chart of types of perishable goods.
2. Spell out the role of warehouse executives.
3. Demonstrate the importance of ERP with an example.

Session 2: Sorting and Grading Operations in Cold Chain

Cold Storage Warehouse is a storage location which is used to store perishable products such as fruits, vegetables, dairy products, fish and meat products at a desired temperature and humidity to ensure quality of the product for longer period. For example, say one needs to store fresh fruits and vegetables, so keeping them at the right cold temperature will reduce the risk of damage and extend their shelf life. If the same food is kept in a warm place, then it will wilt faster and attract bad pests that will spoil the goods.

Cold Storage is like refrigerator at home. Fruits and vegetables are stored in them, to keep them fresh for several days. CSW is like a massive refrigerator.

Cold Chain is the series of coordinated activities which manages the fruits and vegetables from farm to fork. This includes collection, transportation in temperature-controlled vehicles and cold storage to keep the products fresh and of consistent quality for longer period of time.

Following are the products which are typically stored in CSW:

1. Fruits and vegetables.
2. Dairy products.
3. Processed food items (Pickle, jams, chocolates).
4. Fish and meat products.
5. Flowers and plants.
6. Pharmaceutical drugs.
7. Certain chemicals.
8. Certain beauty products.

Ideal time required for each cold chain activity

Cold chain may be broadly classified based on storage temperature and total holding life into following typical temperature requirements for various kind of products:

a) Chill- (0 o C to 10 o C) - temperate fresh fruits & vegetables, fresh meats, milk, butter, etc.

b) Mild Chill (10 o C to 20 o C) - sub-tropical fresh fruits & vegetables, chocolates and seeds and some milk products.

c) Frozen (below-18 o C) - frozen ingredients, processed fruits & vegetables, Ice Cream, frozen meats (fish, poultry, livestock), etc.

d) Normal (& greater; 20 o C) - whole onion, dehydrated foods, pickle, jams and oils and extracts.

The key function of the CSW is to maintain the temperature of the products at the desired levels.

This is done through a set of chambers which are maintained at a temperature as demanded by the products being stored.

Data Logger

Data logger is an electronic mechanism which automatically monitors and records environmental parameters over the period of time, allowing measuring conditions, analysed, validated and documented.

The data logger (Fig. 1.5) has a sensor to receive the information and a computer chip to store it. The information stored in the data logger is transferred to a computer for analysis.

Fig. 1.5: Data Logger

PROCESS FLOW OF COLD CHAIN OPERATION

The process of flow of cold chain operation in warehouse is separate for various perishable goods. The cold chain is a part of logistics management process for perishable goods which needs a refrigerator for certain level of temperatures. It's a process of performing a chain of tasks like; preparing goods, storing them in respective places, and transporting products along the cold supply chain.

If warehouse associate fails to keep products in cold chain storage then it will render them unusable, this leads to wastage of the products. When cold products turn bad it will spoil the money of both the parties. A cold chain (Fig. 1.6) service provider ensures that temperature-sensitive products are kept within accurate temperature ranges and protects desired temperature from start to finish.

Fig. 1.6: Cold Chain Storage

For example, ice cream kept in deep freezer to save its shelf life. Suppliers of food items and pharmaceutical products are more concerned about cold chain so that shipment doesn't affect the delivery of goods that are in good condition. They always want to update cold chain management so that they can serve better facilities. Fortunately, they can always turn to dedicated shipping companies to ensure timely and efficient delivery of their shipment to prospective consumers.

Outsourcing of cold chain services must ensure the proper management of food and pharmaceutical products like temperature-controlled supply chain.

Cold chain warehouse allows focusing on core business and helps to know

about reliable partner willing to maintain cold chain and work according to schedule.

The cold chain process includes the storage of goods, packaging of products, tracking the movement of goods, transportation of goods within the warehouse, customs clearance of dead stock, product management inside the warehouse, and delivery of products safely and securely.

Types of Cold Chain Management

Process of cold chain management focuses on technology which monitors and maintains the temperature as per the nature of goods. Following are the types of Cold chain management:

1. **Storage:** products like insulated containers, vaccine and medical refrigerators and freezers, refrigerants, cold rooms/chillers are keys of effective cold storage. It can be done with the help of cold chain equipment.

2. **Packaging:** when products leave storage area, cold packaging is vital to maintaining and monitoring temperature and security. Products such as cold chain parcel and pallet systems, refrigerant bricks, gel packs, gel bottles, and insulated containers and envelopes keep the products cold and fresh, improve transportation facilities, and prevent from damage, waste, and loss of goods.

Fig. 1.7: Tracking

3. **Tracking:** data loggers and temperature indicators give shippers and maintain real-time temperature as per goods nature and GPS tracking machine to monitoring and tracking the goods (Fig. 1.7).

4. **Transportation:** global supply chain means temperature-sensitive

goods and products being moved around the world in a range of ways. Cold chain vehicles for perishable goods like refrigerated vehicles and containers to store and move the goods from cold chain warehouse across waterways, airways, and along global/local roads and highways.

5. **Customs Clearance:** paperwork and legal documents play a vital role in cold chain supplies to ensure about products which can be transported quickly. If they fail to meet the custom clearances, it may result in form of delay, product loss, compromise in product quality and expense in transport, storage and delivery.

6. **Product Management:** supplies of specialised goods through cold parcels and pallets, insulated envelopes and containers and warehouse best practices like mobile robots, forklifts are moved and handled securely and safely within the cold chain.

7. **Delivery:** temperature-sensitive goods must be delivered in specific period of time. The cold chain management process includes review of documentation, risk management, best handling practices and securing compliant warehouse, storage, and display systems.

Characteristics

The handling of perishable goods as per temperature and time in warehouse is a concern that varies from product to product.

1. **Dairy Goods Group:** Dairy Group includes milk, yogurt, cheese, lactose-free milk and fortified soy milk and yogurt that have a very short life. It does not include foods made from milk which have little calcium and high fat ingredients like sour cream, cream cheese, cream and butter.

2. **Vegetable Goods Group:** vegetables or vegetable juice comes under Vegetable Group (Fig. 1.8). Vegetables can be raw or cooked, fresh, frozen, canned, or dried/dehydrated. This group contains five types of vegetables based on their nutritional value like beans and peas, dark-green vegetables, starchy vegetables, red and orange vegetables, and other vegetables.

Fig. 1.8: Vegetable Group

3. **Fruit Goods Group:** Any fruit or juice comes under Fruit Group. Fruits (Fig. 1.9) are divided based on fresh, dried, frozen fruits, canned, etc.

Fig. 1.9: Fruit group

4. **Protein Goods Group:** It include variety of goods like poultry, meat, seafood, beans, peas, and lentils, eggs, processed soy products, nuts, seeds, etc. Meat and poultry choices should be lean or low-fat. Vegetarian options in Protein Foods Group (Fig. 1.10) include beans and peas, processed soy products, and nuts and seeds.

Fig. 1.10: Protein group

Maintenance Temperature

1. The temperature of the chamber is set to the requirement of the product being stored.

2. The storage will have a calibrated data logger and display system.

3. The data from the data logger will be downloaded every day to check any deviations from the desired temperature.

4. The display from the data logger could be monitored manually also every hour by checking the temperature or it can be done through system by connecting the data logger to the computer.

SEGREGATION, SORTING AND GRADING OPERATIONS OF PERISHABLE PRODUCTS

Sorting and grading are one the main activity while handling perishable products like fruits and vegetables post-harvest before they are stored in the cold storage warehouse. Sorting means categorization based on quality, shape, texture or size. Once the things are sorted, they are graded or assigned a specific code (value) generally to mark them for specific use or to assign them a market value.

Sorting of Goods

Sorting refers to separation of cleaned products into various quality fractions that may be defined on the basis of size, shape, density, texture and color. Separating different types of product from product lot is called sorting (Fig. 1.11). It depends on:

➢ **Shape:** If the fruit is going to be further packed, its shape is essential.

➢ **Size:** Size is also an important criterion for sorting fruits from fruit lot. The target is to select same sized fruits.

➢ **Maturing:** The fruits can be classified based on the degree of maturity of the products.

➢ **Color:** Color of the fruit also indicates the level of maturity of the fruit. Further the likeability of the product by the final customer is not determined by the color.

➢ **Damage product:** Damaged product should be separated from fruit lot and should not travel further.

➢ **Diseases:** It is an important function of sorting to separate the diseased free fruit and vegetable from a lot.

➢ **Insect cutting products:** it must be identified and avoided at all costs otherwise it will spoil other fruits and vegetables.

Fig. 1.11: Sorting of Goods

Grading of Goods

Grading is segregating fruits and vegetables into various standard and grades as per the size, color, shape, volume, etc., to fetch defined price in market. Arrangement of products into different groups by separating from a lot is called grading (Fig. 1.12). Grading can depend upon shape, size, appearance, color and quality.

Fig. 1.12: Grading of Goods

For exports and international trade, grading of agricultural produce is a perquisite. Generally, fruits are graded based on size, weight, specific gravity, color, variety, etc. Size grading is predominantly followed in almost all types of fruits. Fruits are graded as small, medium, large and extra-large. Based on maturity, fruits can be graded as immature, mature and over mature.

Maturity based grading is also deciding quality and shelf life of the product. Vegetables like okra, bell pepper, bitter gourd, brinjal and green chili are also graded into 3 grades as small, medium and large. The vegetables like tomato are graded based on color.

Following are the objectives of grading:

- To get better price in the market.
- To create differential value based on the criteria.
- To grade the product as per the requirements of the world market.
- To facilitate marketing of the product.
- To ease packaging.
- To simplify the transportation of the product.
- To stretch the shelf life.

For International market, 3 general grades are considered as:

- Extra class.
- Class I.
- Class II.

1. **Extra Class:** The extra class is the highest grade and confirms the product to be of superior quality. It possesses uniformity in the shapes, color and size, and without any defect which may affect the taste and flavor of the product. A 5% tolerance is allowed for errors.

2. **Class I:** This is almost the same quality as extra class, except for the fact instead of 5%, 10% tolerance is allowed. In case of individual fruit, small defect can be considered like shape, color and minor skin. The defect which has small impact on general appearance is also considerable of product.

3. **Class II:** In this class the product may exhibit some external or internal defects. This class is not fit for international markets and used only for local sales. This is meant for customers who are price sensitive and may not be very demanding in terms of quality. In India, the fruit growers mostly grade manually. There are trained people who do this job.

However, manual grading has several disadvantages like being inconsistent, time consuming and costly. Now there are machines which can be used to grade fruits. Generally, fruits are graded on size. There are machines which

can grade fruits based on the size.

Meaning of Cleaning Process of Cold Chain Warehouse

A cold storage warehouse is a building designed to keep certain environmental situation and temperature. Superficially, these warehouses appear like other classic warehouses but are at variance internally to meet specific requirements.

Cold storage (Fig. 1.13) is not new since customers always preferred to eat fresh and healthy food, so they needed to store food at cold temperatures. To keep them fresh home fridges and freezers were used. The food products can be store in cold place for longer period of time. Thus maintaining quality and safety is very important.

Fig. 1.13: Cold storage

Types of Cold Storage Warehouse

Cold storage warehousing categorises into two forms:

• Refrigerated controlled temperature ranging from 0 to 10 °C.

• Fully frozen, with temperature control between -30 to 0°C.

Each type of cold storage has a different purpose. A refrigerated storage warehouse, typically for food, aims to maintain the product at an optimum temperature that abates spoilage and extends product life.

A freezer warehouse keeps goods at accurate temperature to moderate risk of spoilage of goods.

Cold storage warehouse products are sensitive. And it changes in temperature, facilities, sensor to control the environmental temperature inside. Since humidity is a major consideration, dehumidifiers are employed to control and reduce ice formation.

Since cold storage warehouses must be kept at specific temperatures at all times, the added difficulty is in product inflows and outflows. With the constant movement of goods, secure airlock systems are installed to help maintain temperature consistency. Storage rooms have two high-speed doors, one leads into cold storage space itself and other leads outside, both of which never open at same time.

It minimizes sudden changes in temperature and also reduces condensation, and cold loss. Its solution includes mobile pallet racking. This system can maximize floor space by having only one operating aisle.

Another ideal option for chilled and cold storage goods is drive-in racking (Fig. 1.14). This warehousing method allows for storage in large quantities, again making the same available space more efficient by up to 90%.

Fig. 1.14: Drive-in racking

After a period of use, the appearance of mold or stains in cold storage is inevitable which will affect the quality of preserved products in warehouse. Therefore, the cleaning of cold storage for preserving supplies like food and vaccine or medicines is extremely important. There are various types of equipment's required for cold chain warehouse to remove product from slots. There are two ways to clean warehouse.

1. Traditional way of cleaning cold storage: In the traditional method of

cleaning of cold storage warehouse such as broom, water, some chemicals and mold removal chemical is used, and the whole process done manually.

2. Modern way of cleaning cold storage: In the modern method of cleaning, the electric tools for cold storage warehouse is used.

In some cold storage warehouse dry ice blasters are also used to make the cleaning of cold storage easier and more efficient.

Activities

Activity 1: Prepare a chart showing the list of equipment used while handling goods in cold chain warehouse.

Material Required: Note Book, Pen/Pencil, Check list

Procedure:

1. Collect the materials about the equipment used while handling goods in cold chain warehouse.

2. Collect the picture from internet and textbook related to equipment used while handling goods in cold chain warehouse.

   a) Refrigerated Trucks
   b) Cold Storage Rooms
   c) Temperature Monitoring Systems
   d) Insulated Containers
   e) Pallet Jacks
   f) Forklifts
   g) Cooling Plates
   h) Cold Chain Packaging Materials
   i) Blast Freezers
   j) Thermal Blankets

3. Prepare a chart with detailed information.

4. Show your rough notes to the subject teacher and confirm.

5. Prepare a chart and discuss with classmates and show it to the teacher.

6. Discuss your report in the class.

Activity 2: Have a discussion containing measuring of the units and scales

used in cold storage operations

Material required: Check list, Notepad, pen/pencil, etc.

Procedure:

1. Collect the materials about different units and scales used for handling various perishable products.

2. Collect the materials about the different products and required temperature of various perishable products.

   a) Fruits and Vegetables: 0°C to 4°C
   b) Dairy Products: 1°C to 4°C
   c) Meat: -1°C to 4°C
   d) Fish and Seafood: -1°C to 2°C
   e) Frozen Foods: -18°C or lower
   f) Pharmaceuticals: 2°C to 8°C
   g) Flowers and Plants: 0°C to 2°C
   h) Eggs: 0°C to 4°C
   i) Prepared Meals: 0°C to 4°C

   j) Ice Cream: -20°C or lower

3. Have a discussion among students in the presence of subject teacher about the precautions as per Standard Operating Procedures (SOP) for handling various perishable products.

4. Subject teacher must make corrections.

5. Write the conclusion.

Activity 3: Prepare a Chart on segregating, sorting, grading and maintaining the temperature of perishable goods stored in warehouse.

Material Required: Note Book, Pen/Pencil, Check list

Procedure:

1. Visit a warehouse along with peers.

2. Meet the warehouse associate and others and greet them.

3. Take a tour of the warehouse and enquire from the manager about the following:

   a) Segregation of the perishable goods as per SOP.

   b) Sorting of the perishable goods as per SOP.

   c) Grading of the perishable goods as per SOP.

   d) Customer needs and standardising the perishable goods as per SOP.

   e) Maintaining cold chain temperature properly.

4. Discuss with the warehouse associate about the warehouse practices.

5. Show your notes to the warehouse associate and confirm.

6. Prepare a report and discuss with friends and show it to the teacher.

7. Discuss your report in the class.

Check Your Progress

A. Fill in the Blanks

1. _____ warehouse is a storage location which is used to store perishables products.

2. Cold Chain is the _____ of coordinated activities which manages the fruits and vegetables from farm to fork.

3. The _____ has a sensor to receive the information and a computer chip to store it.

4. Outsourcing of _____ must ensure the proper management of food and pharmaceutical products like temperature-controlled supply chain.

5. _____ goods must be delivered in specific period of time.

6. The storage will have a calibrated data logger and_____.

7. _____ means categorisation based on quality, shape, texture or size.

B. Multiple Choice Questions

1. Products which are typically stored in CSW: _____

   a) Fruits and vegetables
   b) Dairy products
   c) Processed food items
   d) All the above

2. Cold Storage is like _____ at home.

   a) Television
   b) Refrigerator
   c) Fan
   d) Only (a) and (b)

3. Cold chain may be broadly classified based on storage temperature and total holding life. What is the normal temperature requirements for various kind of products?

   a) Normal (& greater; 2 o C)

b) Normal (& greater; 12 o C)

c) Normal (& greater; 20 o C)

d) Normal (& greater; 22 o C)

4. Process of cold chain management focuses on technology which monitors and maintains the temperature as per nature of goods _____

   a) Storage, Packaging, Tracking, Transportation, Custom clearance, Product management, Delivery.

   b) Storage, Packaging, Transportation, Tracking, Custom clearance, Product management, Delivery.

   c) Storage, Tracking, Packaging, Transportation, Custom clearance, Product management, Delivery.

   d) Storage, Packaging, Tracking, Transportation, Custom clearance, Delivery, Product management.

5. Sorting refers to separation of cleaned products into various quality fractions that may be defined on the basis of

   a) Size and color.

   b) Shape and texture.

   c) Density.

   d) All the above.

6. Arrangement of products into different groups by separating from a lot is called grading. Grading can't depend upon:

   a) Shape.

   b) Smell.

   c) Appearance.

   d) Color.

C. State whether the following statements are True or False

1. If warehouse associate fails to keep products in cold chain storage then it will render them unusable, this will not lead to wastage of the products.

2. When cold products turn bad it will save the money of both the parties.

3. Maturity based grading is also deciding quality and shelf life of the product.

4. The cleaning of cold storage for preserving supplies like food and vaccine or medicines is extremely important.

5. Process of cold chain management focuses on technology which monitors and maintains the temperature as per the nature of goods.

D. Short Answer Questions

1. Define cold chain.
2. What is cleaning process?
3. What is data logger?
4. What is sorting?
5. What is separating?

E. Long Answer Questions

1. Explain various types of perishable goods which are store in cold storage warehouse.
2. Discuss the ideal time required for each cold chain activity.
3. Explain the process of cold chain management.
4. Detail out the characteristics of the products being handled, for e.g.: texture, odor, stickiness, etc.
5. Explain the types of cold storage warehouse.

F. Check Your Performance

1. Draw a flow chart of types of cold storage warehouse.
2. Spell out the types of perishable goods which are stored in cold storage warehouse.
3. Demonstrate the importance of data logger with an example.

Session 3: Material Handling Equipment Usage

After security check of vehicle and consignment confirmation, the security office instructs transporter to place vehicle on warehouse dock (in some cases after halting at parking the placed-on dock). Once vehicle is placed on dock, receiving supervisor first inspects the vehicle's condition for potential damage because of water leakage and dust. After vehicle inspection, as second step, the supervisor goes for vehicle seal inspection to check whether it's intact or not and also checks for seal number.

In last step before unloading of goods from vehicle/container, the receiving supervisor finally inspects stack of goods in vehicle and checks for potential damage causing pointers like wet vehicle floor, dusty floor, damaged corner cartons, etc. Once the receiving supervisor is sure that there is no external/transport related potential causes to damage goods, unloading process of goods starts.

The two most fundamental operations in the warehouse are loading and unloading. Warehouse is a flow through place, where inventory comes, stays for some time and moves out. Unloading and loading are continuous and everyday activities and most important activities for warehouse associates. Warehouse Associate needs to understand which MHE shall be used for which kind of products. The most frequently used MHE in warehouse is hand

pallet truck.

Unloading is the start of the warehouse operations. It brings in the cargo to be stored, processed and further dispatched. Being the step one of the cycle, it is essential that it is done in the right manner. The scope of unloading activities starts from parking of the incoming vehicle, unloading, staging, quality check, scanning, put away to the right location and finally updating the records in the system to generate the GRN.

MATERIAL HANDLING EQUIPMENT AND THEIR USES FOR PERISHABLE GOODS

Besides the common MHE used in cold storage warehouse (Fig. 1.15) like other warehouses, there are several specialized equipment required in cold storage warehouse.

Cold chain is critical part of food supply. Efficiency becomes crucial in cold and frozen storage because food can go bad if exposed to improper temperatures for too long. The right material handling equipment can be the difference between achieving success and seeing it melt away. MHE used in cold chain warehouses are as follows-

1. Quick Freezing Racks (QFR) - they help to decrease freezing time by improving the airflow. They allow faster freezing of the environment and consumes less power.

2. Temperature data Loggers & Wireless Radio Frequency Identification (RFID). The temperature history of the warehouse can be monitored using temperature data loggers and RFID tags. They also help to determine the remaining shelf life of the products stored.

Fig. 1.15: MHE used in Perishable Goods

3. Freezer spacer – These help to separate stacks of products when they are being frozen and can be easily removed when the goods are solid.

4. Humidifiers – The storage of products in cold storage requires maintenance of both temperature and humidity. This equipment helps to maintain the humidity inside the chamber at a certain level.

5. Cold Storage Systems - They help to keep the cold storage cool.

Organisational procedures and policy on quality, use of PPEs, use of equipment, MHEs, documentation, etc.

Organisational procedures and policy on quality varies from company to company and from product to product. There is some base on which Organisational procedures and policy on quality are decided like use of personal protective equipment, use of material handling equipment, documentation related to products, etc. Let's discuss it one by one:

Use of Personal Protective Equipment: The usage of PPE (Fig. 1.16) focuses on cold chain warehousing and all precautions that need to be taken for storing perishable goods. The Personal Protective Equipment are supposed to be used while handling the perishable goods and the various materials handling equipment involved in loading/unloading of perishable goods. Quarantine procedure is required to be followed for perishable goods to avoid further contamination of other goods. Hygiene is crucial to be maintained in the warehouse, especially in cold chain warehouse.

Fig. 1.16: PPE in Warehouse

Use of Warehouse Equipment: Warehouse equipment are used for storage, movement, protection and control of perishable goods and people throughout the end to end process of the warehouse. Materials handling includes moving, packaging, and storing all the materials used inside the warehouse. The equipment used in warehouse are broadly classified into three categories- storing equipment, material handling equipment, safety equipment.

Forklifts, reach stackers, pallet trucks, heavy duty racks, slotted angle racks, cranes, hoists, handrails, bollards, wire partitions are all example of warehouse handling equipment. Warehouse equipment are used to increase output, control costs, and maximise productivity.

Use of Material Handling Equipment: The warehouse associate needs to ensure that the Material Handling Equipment (MHE) supervisor & technician have sufficient material handling equipment to carry out the day's load (day's work).

There might be problems in MHE maintenance, equipment breaks down, in-sufficient material handling equipment, etc. In such cases the warehouse associate needs to co-ordinate with the MHE supervisor for proper co-ordination and proper utilisation of MHE. The associate needs to have

backup plan in case of any challenges.

Documentation: Documentation is another vital part of warehousing operations. There is various type of documents like pick list, Goods Receipt Check List (GRCL), Bill of Material (BOM), and several others which are essential to conduct warehousing operations on day to day basis. They facilitate the allocation of work, picking and put away of right quantities in time and correct processing of customer orders. Record Keeping focuses on inventory and whenever the goods are transported from the warehouse to the consignee, they need to carry the transit documentation. Audits are subject to frequent audits for inventory reconciliations, adherence to Standard Operating Procedures (SOP) and regulatory compliances. Documentation (Fig. 1.17) provides the complete history and trail of all the transactions which happen in the warehouse.

Fig. 1.17: Documentation

Precautions to keep in mind while loading of perishable products

Material handling equipment are critical for warehouse operations. The two most fundamental operations in the warehouse are loading and unloading. Once the goods arrive at warehouse they need to unload the goods and store in respective storage areas with the help of right material handling equipment. Unloading and loading of perishable goods are continuous and everyday activities and the most important activity for warehouse associates.

- Don't touch the goods without wearing the gloves or with dirty hands.

- Make a proper arrangement of MHE.

- Always use appropriate handling equipment before loading the goods.

- Use appropriate storage equipment so that it can reduce wastage and spoilage of material.

Company's policy and work instructions on quality standards

The quality standard of any organisation depends on their company policy. The cleanliness of warehouse is one of the important elements as per the quality standard is concern. Because perishable goods have very short life of 1-2 days and if we don't maintain appropriate cleanliness it can damage the rest of goods. A proper and cool room is highly required for quality standards. As it stores perishable goods, proper cleaning procedures are supposed to be followed of cold room to preserve quality of stored products and unit itself.

Benefits of Cleaning Cold Room: Coils can reduce performance and maintain hygiene over time. Additionally, coil surfaces can become contaminated inside the surface with dirt, mold, bacteria etc. Unhygienic cold storage rooms not only bring goods at risk of contamination, but also point the power usage to up to 50%. By cleaning cool room (Fig. 1.18) regularly, the above scenarios and experience can be avoided by:

- Improved airflow

- Increased cooling capacity.

- Consistent temperature.

- Elimination of contaminants.

- Mold-free storage.

- Reduced food spoilage.

- Extended product shelf life.

Fig. 1.18: Cleaning Cold Room

Mold: It can grow within the cold room. There are many reasons of its growth such as; cracks, leaks or damaged seals around the door. It results into warm and humid air inside cold room.

Activities

Activity 1: Remove, clean and maintain warehouse aisles and product slots.

Material Required: Note Book, Pen/Pencil, Check list.

Procedure:

1. Collect the materials related to the equipment used while moving the perishable goods in warehouse.

2. Collect the content about how to clean and maintain warehouse aisles and product slots for smooth movements.

3. Understand the process of removing product from slots with the use of a pallet jack.

4. Explain the process of cleaning the slot with cleaning supplies and scrubbers (electric or manual).

5. Collect the picture from internet and textbook related to

   a) Aisles

   b) Products slot

   c) Pallet jacks

   d) Cleaning supplies and

   e) Scrubbers in cold chain warehouse

6. Prepare a chart with detailed information.

7. Show your notes to the subject teacher and confirm.

8. Prepare a chart and discuss with classmates and show it to the teacher.

9. Discuss your report in the class.

Activity 2: Have a discussion and enlist precautions as per SOP to prevent contamination of perishable products.

Material required: Check list, Notepad, pen /pencil etc.

Procedure:

1. Collect the materials about the precautions as per to prevent contamination of perishable products.

2. Have a discussion among students in the presence of subject teacher about the precautions as per Standard Operating Procedures (SOP) to prevent contamination of perishable products.

   a) Maintain Proper Temperature

b) Use Clean and Sanitized Equipment

c) Follow Hygiene Practices

d) Regular Inspections

e) Proper Packaging

f) Segregate Different Types of Products

g) Use of Personal Protective Equipment (PPE)

3. Write down the points discussed in classroom.

4. Subject teacher must make corrections.

5. Write the conclusion.

Activity 3: Visit a company and make notes of its reporting structure, company's policy and work instructions on quality standards.

Material Required: Note Book, Pen/Pencil, Checklist.

Procedure:

1. Visit a warehouse along with peers.

2. Meet the warehouse associate and other employees in the warehouse.

3. Take a tour and enquire to warehouse about company reporting structure.

a) Hierarchy Levels

b) Reporting Lines

c) Roles and Responsibilities

d) Communication Protocols

e) Frequency of Reporting

f) Key Contact Points

g) Escalation Procedures

h) Documentation Requirements

i) Performance Review Process

j) Inter-departmental Coordination

4. Also ask about work instructions on quality standards.

5. How to verify the quality within given standards.

6. Make a report on it and submit to your subject teacher.

Activity 4: Identify goods to be moved either to the storage from the staging area/unloading area and also make arrangement of equipment/tools.

Material Required: Note Book, Pen/Pencil, Check list.

Procedure:

1. Collect the materials related to the goods to be moved either to the storage from the staging area/unloading area, and equipment used while handling goods in cold chain warehouse.

2. Also collect the material about equipment/tools such as

   a) Pallets

   b) reach stack

   c) fork lift

   d) PPE (according to types of perishable product)

3. Collect pictures from internet and textbook related to storage of goods in warehouse.

4. Prepare a chart with detailed information.

5. Show your notes to the subject teacher and confirm.

6. Prepare a chart and discuss with classmates and show it to the teacher.

7. Discuss your report in the class.

Activity 5: Demonstrate the operation of MHE to pick the perishable items and how to load finished pallets of perishable products on assigned trailers safely and accurately.

Material Required: Note Book, Pen/Pencil, Check list

Procedure:

1. Visit a warehouse along with peers.

2. Meet the warehouse associate and others and greet them.

3. Take a tour of the warehouse and enquire from the manager about the following:

   a) Operation of MHE.

   b) How to pick the perishable items and precautions kept in mind?

   c) How to load finished pallets of perishable products on assigned trailers safely and accurately?

4. Discuss with the warehouse associate about MHE in warehouse.

5. Show your notes to the warehouse associate and confirm.

6. Prepare a report and discuss with classmates and show it to the teacher.

7. Discuss your report in the class.

Check Your Progress

A. Fill in the Blanks

1. _____are used for storage, movement, protection and control of perishable goods and people throughout the end to end process of the warehouse.

2. The two most fundamental operations in the warehouse are loading and_____.

3. _____is critical part of food supply.

4. _____ racks help to decrease freezing time by improving the airflow.

5. _____ and policy on quality varies from company to company and from product to product.

6. _____is crucial to be maintained in the warehouse, especially in cold chain warehouse.

B. Multiple Choice Questions

1. Warehouse equipment are used for _____of perishable goods and people throughout the end to end process of the warehouse dairy products.

   a) Storage
   b) Movement
   c) Protection and control
   d) All the above

2. Cold there are some base on which Organisational procedures and policy on quality decide like _____

   a) Use of personal protective equipment.
   b) Use of material handling equipment.
   c) Documentation.
   d) All the above.

3. Documentation is another vital part of warehousing operations. There is various type of documents like _____

   a) Goods Receipt Check List (GRCL).
   b) Bill of Material (BOM).
   c) Both (a) and (b).
   d) None of the above.

4. Which is not the activity of warehouse associates?

   a) Touch the goods without wearing the gloves or with dirty hands
   b) Make a proper arrangement of MHE

    c) Use appropriate storage equipment

    d) All the above

5. By cleaning cool room regularly, the above scenarios and experience can be avoided:

    a) Improved airflow

    b) Increased cooling capacity

    c) Consistent temperature

    d) All the above

C. State whether the following statements are True or False

1. Unloading and loading are continuous and everyday activities.
2. The storage of products in cold storage requires maintenance of only temperature.
3. Warehouse equipment are used to increase output, control costs, and maximize productivity.
4. Documentation is not a part of warehousing operations.
5. The temperature history of the warehouse can be monitored using temperature data loggers and RFID tags.

D. Short Answer Questions

1. Define loading.
2. What is unloading?
3. What is material handling equipment?
4. What is personal protective equipment?
5. What is documentation?

E. Long Answer Questions

1. Explain organisational procedures and policy on quality.
2. Discuss in detail about the loading and unloading of goods.
3. Explain the various type of material handling equipment used for perishable goods.
4. What are the precautions to keep in mind while loading of perishable products?
5. Explain the benefits of cleaning cold room.

F. Check Your Performance

1. Draw a flow chart of organisational procedures and policy on quality.
2. Spell out the various types of material handling equipment used for perishable goods.
3. Demonstrate the benefits of cleaning cold room.

Session 4: Contaminated Goods and Procedure of Quarantine

As seen in the previous session, Material handling equipment (MHE) is machine equipment used for movement of materials inside the warehouse. Like all other warehouse operations, cold storage warehouse too requires its own set of equipment. MHE is required for loading and unloading in the warehouse.

CONTAMINATED GOODS

Food contamination refers to presence of harmful micro-organisms in food, which can be the foundation of consumer illness. Some of the examples of contaminated goods are –

Fruits and vegetables (Fig. 1.19) start to decay from the moment they are harvested. Microorganisms present in the environment try to take residence in them to feed on the moisture and nutrients inside them. The purpose of the cold storage is to prevent growth of these microorganisms inside the fruits and vegetables.

Fig. 1.19: Contaminated Goods

To avoid product contamination following are required:

- ➢ Trained staff for food safety.
- ➢ Maintaining sanitation in warehouse.
- ➢ Organising workflow.

➢ Labelling and tracking all products.

➢ Maintaining exteriors of the facility.

➢ Buying the right equipment.

Quarantine Procedures for Contaminated Products

In spite of taking all the precautions, the products stored may still get contaminated. Following steps should be taken for the stored goods

➢ Inspection (Fig. 1.20).

➢ Sampling and analysis.

➢ Inspection of staff hygiene.

➢ Examination of all verification systems set up by the undertaking, and of results obtained.

Fig. 1.20: Inspection

During sampling and analysis, if any contaminated products are found, the following steps should be taken:

➢ The entire lot from which the samples has been drawn to be examined.

➢ Checking the data logger records to find any variations in the temperatures.

➢ Checking of any lack of hygiene during the storage process.

➢ All the contaminated products should immediately be removed so that they do not spread any further contamination.

> ➢ The isolated contaminated goods should remove from cold storage and should be moved immediately to the quarantine area.

> ➢ Quarantine area is the designated area for storage of all contaminated products.

> ➢ The material once moved into the quarantine area should be handled as per the SOP of the company.

Quality control in the warehousing process is an important tool to prevent the contamination. When a product has any quality issues and declared unfit for shipping by a warehouse associate, means it has to be moved to an isolated area in the warehouse for further inspection/processes.

PROCEDURES FOR DEALING WITH LOSS OR DAMAGE TO GOODS

One of the types of losses most likely to arise under a logistics contract is loss of or damage to the goods (Fig. 1.21). This could arise either whilst the goods are in transit or when being stored at the supplier's warehouse.

Fig. 1.21: Damaged Goods

From the customer's perspective, it's goods are one of its most valuable assets, so it will be of vital importance that it protects itself against any loss or damage caused to the goods whilst the supplier is performing the services.

From the supplier's perspective, it will be aware of the customer's concerns about the safety of the goods whilst they are in the supplier's possession and will be keen to limit its liability in respect of any loss or damage caused to the goods but also to mitigate against such loss or damage occurring in the first

place.

Risk and impact of not following defined work safety and security procedure

As the cold storage warehouse stores food products most of the time, the cleanliness and hygiene of the warehouse (Fig. 1.22) is of utmost importance. Food contamination at the warehouse is a cause of major worry for the companies dealing in food products.

Fig. 1.22: Cleanliness and hygiene of the warehouse

Following are some of steps which can be taken to maintain the hygiene and cleanliness of the warehouse and prevent any food contamination:

Maintain the Exterior of the Facility: The exterior of the warehouse from where the products enter and exit the warehouse could be a source of bacteria and airborne diseases. Following are the steps to maintain exterior of warehouse:

➢ Regular Pest control.

➢ Ensure safe and solid construction of facility.

➢ Secure the facility for any unauthorised entry and exit.

➢ Proper disposal of trash.

Label and Track All Products: Once the products enter the warehouse it should be closely monitored. Warehouse should strictly follow FIFO or First In First Out Policies. Products should be properly labeled for their expiry date, date of receipt and their storage temperatures.

Manage the Workflow to Prevent Contamination: Any handling of the food product exposes risk of contamination (Fig. 1.23). Physical space should be maintained between where products are handled and other areas of the warehouse such as doors, walls and dividers. Some of the factors to be

considered are:

- ➢ Maintaining proper temperatures.
- ➢ Keeping facilities dry.
- ➢ Separating raw products.
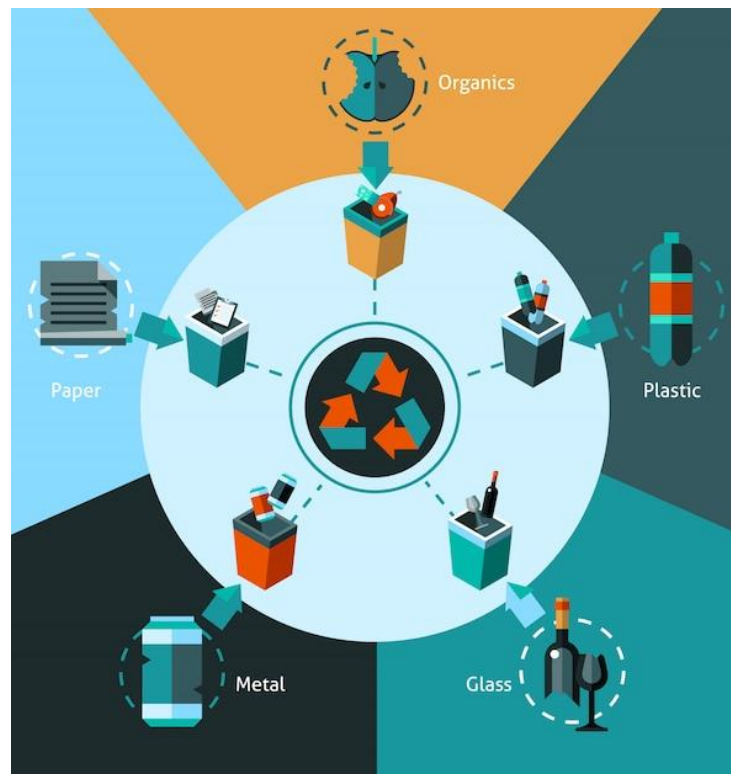
Fig. 1.23: Food product exposes risk of contamination

Train the Staff on Food Safety Procedures: It is critical that the entire warehouse team which is handling the products is aware about the food safety practices.

- ➢ Enforce handwashing.
- ➢ Enforce good personal hygiene.
- ➢ Designate break areas.
- ➢ Establish an employee illness policy.

Maintain Sanitation of the Warehouse: This is the most critical step. Maintaining cleaning machines and equipment is of vital importance.

- ➢ Establish regular cleaning procedures.
- ➢ Complete cleaning and sanitation on time.
- ➢ Store equipment safely when not in use.

Buy the Right Equipment: The equipment which is used in the warehouse is also of critical importance. The equipment ideally should be easy to clean,

able to withstand cold temperatures. Stainless steel equipment is the best to be used for cold storage warehouse. The pallets should ideally be plastic instead of wood.

The most vital step for preventing product from contamination is maintaining cleanliness of the facility and the equipment. Following are the steps which can be done to maintain hygiene:

Establish Regular Cleaning Procedures: There should be regular and scheduled cleaning of warehouse and all equipment. Proper chemicals and cleaning equipment should be used to clean the facility.

Complete Cleaning and Sanitation on Time: Cleaning should always be completed on schedule to ensure nothing is missed or skipped, as the bacteria are microscopic.

Store Equipment Safely When Not in Use: When not using equipment, it should be cleaned before putting it in storage. This ensures that bacteria do not nurture on equipment while not in use.

Precautions followed to Prevent Contamination

Following are the precautions to be followed to avoid contamination of the food stored in cold storage:

➢ Avoid storing bruised or damaged fruits and vegetables.

➢ Store goods away from other frozen raw foods like poultry, meat and seafood to avoid any danger of cross contamination.

➢ Clean fruits and vegetables well before storing. Dirty products can cause contamination.

➢ Use clean water for washing fruits and vegetables.

➢ Wash and scrub fruits and vegetables form rough surfaces such as potatoes.

➢ Use a clean scrub brush for products.

➢ Do not mix lots. Each product from one farm should be stored together. Do not mix products from different farms or at different maturity stages.

➢ Once they have been stored and the temperature has been set, continuously monitor the data logger for temperatures. The temperatures should vary within the tolerance only. In case of any variations, immediate action must be taken to prevent any increase in the temperature and thus growth of bacteria.

➢ Cold storage areas should be clean and free from moisture or ice buildup.

➢ Foods should be stored at least 6-inches away from the floor and 2-

inches away from the wall on racks or pallets and should be arranged to allow for air circulation.

➤ Don't store foods on floor. All items should be marked with a receiving date prior to shelving.

➤ Opened ingredients should be stored in sealed, airtight containers.

➤ Previously frozen food items must not be refrozen.

➤ Cold storage facility doors should be kept closed when not in use.

Activities

Activity 1: Prepare a chart showing quarantine procedure for contaminated goods.

Material Required: Note Book, Pen/Pencil, Check list.

Procedure:

1. Collect the materials about the quarantine procedure for contaminated goods in warehouse.

2. Collect the picture from internet and textbook related to quarantine procedure for contaminated goods in cold chain warehouse.

   a) Immediate Identification
   b) Isolation of Contaminated Goods
   c) Record and Document Findings
   d) Notification to Supervisor
   e) Segregation and Quarantine Area Setup
   f) Assessment of Contamination Level

3. Also collect the content related to SOP for contaminated goods and quarantine.

4. Prepare a chart with detailed information.

5. Show your notes to the subject teacher and confirm.

6. Prepare a chart and discuss with classmates and show it to the teacher.

7. Discuss your report in the class.

Activity 2: Prepare daily report and send to supervisor about total loading/unloading done, damages, delays report to supervisor about miss

happenings and accident.

Material required: Check list, Notepad, pen/pencil, etc.

Procedure:

1. Collect the materials about the daily report format and send to supervisor about total loading/unloading done, damages.

2. Collect the materials about the delays report to supervisor about miss happenings and accident.

   a) Immediate Notification
   b) Describe the Incident Clearly
   c) Provide Time and Location Details
   d) Identify Involved Personnel
   e) Assess and Report Impact on Operations
   f) Document Witness Accounts

   g) Collect and Preserve Evidence

3. Have a discussion among students in the presence of subject teacher about the accident take place at warehouse.

4. Subject teacher must make corrections.

5. Write the conclusion.

Check Your Progress

Fill in the Blanks

1. Food_____ refers to presence of harmful micro-organisms in food, which can be a foundation of consumer illness.
2. Fruits and vegetables start to decay from the moment they are_____.
3. _____area is the designated area for storage of all contaminated products.
4. Warehouse should strictly follow _____Policies
5. The _____should ideally be plastic instead of wood.
6. To prevent from contamination wash fruits and _____ form rough surfaces such as potatoes.
7. _____ facility doors should be kept closed when not in use.
8. Cleaning should always be completed on _____ to ensure nothing is missed or skipped.

B. Multiple Choice Questions

1. To avoid product contamination:

   a) Train staff for food safety
   b) Maintain sanitation in warehouse
   c) Organise workflow
   d) All the above

2. The exterior of warehouse from where the products enter and exit the warehouse could be source of

   a) bacteria
   b) airborne diseases
   c) (a) and (b)
   d) none of above

3. In spite of taking all the precautions, the products stored may still get contaminated.

   a) Inspection
   b) Sampling and analysis
   c) Inspection of staff hygiene
   d) All the above

4. Which is not the step to maintain exterior of warehouse:

   a) Irregular Pest control
   b) Ensure safe and solid construction of facility
   c) Secure the facility for any unauthorised entry and exit
   d) Proper disposal of trash

5. Some of the factors affecting workflow to prevent contamination to be considered are:

   a) Maintain proper temperatures
   b) Keep facilities dry
   c) Separate raw products
   d) All the above

C. State whether the following statements are True or False

1. Microorganisms present in the environment try to take residence in them to feed on the moisture and nutrients inside them.
2. All the contaminated products should immediately be removed so that they do not spread any further contamination.
3. Quality control in the warehousing process is not important tool to prevent the contamination.
4. Products should be properly labeled for their expiry date, date of receipt and their storage temperatures.

5. There should be irregular and non-scheduled cleaning of warehouse and all equipment.
6. Cold storage areas should be clean and free from moisture or ice buildup.
7. Previously frozen food must not be de-frozen.

D. Short Answer Questions

1. Define food contamination.
2. What is quarantine?
3. Explain how to avoid product contamination.
4. How sanitation is maintained in warehouse.
5. Write down the steps to maintain exterior of warehouse.

E. Long Answer Questions

1. Discuss quarantine procedures for contaminated products.
2. Explain the various precautions to be followed to avoid contamination of the food stored in cold storage.
3. What are the risks and impacts of not following defined work safety and security procedure?

F. Check Your Performance

1. Draw a flow chart of quarantine procedures for contaminated products.
2. Spell out the various precautions to be followed to avoid contamination of the food stored in cold storage.
3. Demonstrate the training of staff on food safety procedures.

MODULE 2	HANDLING OF FAST-MOVING CONSUMER GOODS

Module Overview

Consumption goods are items that the typical customer buys to use themselves. Consumer products, often known as ultimate goods, are the results of manufacturing and production. Consumer goods like clothing, food, and dishwashers are examples. Consumer products fall into three basic categories: services, non-durables, and durables. Cars and other durable products last for at least three years. Non-durable goods are those products that are quickly eaten and have a shelf life of less than a year. They include things for the fast-moving consumer. Products or services like haircuts or washings are considered intangible services.

A key component of the production process is packaging. In order to increase efficiency, the logistical and distribution systems frequently require secondary and tertiary packing.

The unit pack or primary package is crucial for the preservation of the product and its shelf life. It also provides customers with marketing materials and sales incentives. Fast-moving consumer goods have a high turnover rate, and in addition to being enormous, the market is also fiercely competitive.

In this sector, some of the biggest businesses in the world compete for market share: Tyson Foods, Unilever, Procter and Gamble, Coca-Cola, PepsiCo, Nestle, and Danone. In order to get people to buy their items, businesses must concentrate their efforts on marketing the fast-moving consumer goods.

Online purchases relating to tourism, durable goods, entertainment (including gadgets), and fashion are the most common. The online market system for groceries and other consumable goods is growing as businesses redefine how quickly and efficiently they can deliver things. While non-consumable product categories might outnumber consumable product categories in terms of volume, improvements in logistical efficiency have increased the use of ecommerce platforms for FMCG purchases.

Inventory management is the most important activity of the logistic. It is necessary to understand various tools and techniques of inventory to perform warehouse management.

This unit will focus on how we can handle fast-moving consumer goods in

Warehouse. The first session covers process of moving of FMC goods, the second session includes the picklist and information processing devices, the third session describes about sorting, placing and packing of goods, and the fourth session discusses about the inventory management.

Learning Outcomes

After completing this module, you will be able to:

- Understand the characteristics and management of fast-moving consumer goods in a warehouse.
- Learn to use picklists and information processing devices for efficient order fulfillment.
- Master the techniques for sorting, placing, and packing goods effectively.
- Gain skills in managing and tracking inventory to ensure accuracy and efficiency.

Module Structure

Session 1: FMCG Warehouse Goods

Session 2: Picklist And Information Processing Devices

Session 3: Sorting, Placing and Packing of Goods

Session 4: Inventory Management

Session 1: FMCG Warehouse Goods

Fast-Moving Consumer Goods (FMCG) are sold in large quantities, they are regarded as a dependable source of income. FMCG products are safe investments since they have predictable margins, consistent dividends, and stable returns, but they typically offer limited growth.

MEANING OF FMCG

FMCG products—Fast-Moving Consumer Goods—sell for comparatively little money. 'Consumer Packaged Goods' is another name for these products. FMCG (Fig. 2.1), like soft drinks and confections, have a small shelf life due to strong customer demand, or because they are perishable, like dairy, meat, baked goods, and dairy products. These products are inexpensive and are sold in enormous quantities. When they are in the retail establishment, they also have a high rate of turnover.

Fig. 2.1: Fast-Moving Consumer Goods

TYPES OF FMCG

Fast-moving consumer products are non-durable or goods with a limited shelf life that are consumed quickly.

FMCG can be broken down into a number of categories, including:

Packaged pasta, cereals, and dairy products; examples of processed foods.

Energy drinks, juices, and bottled water; examples of beverages. Painkillers, aspirin, and other over-the-counter drugs; examples of pharmaceuticals.

- Ready-to-eat meals that have been prepared.
- Baked products, including cookies, bagels, and croissants.
- Cleaning items: baking soda, window, glass cleaner, etc.
- Office supplies: pencils, markers, and pens.
- Cosmetics and toiletries: hair care products, toothpaste, concealers, and soap.
- Fresh food, dry goods, frozen foods: vegetables, fruits, carrots, frozen peas, and raisins and almonds.

As of 2017, 10 biggest and most popular brand names of FMCG sector are (refer table 2.1):

Nestle	$91.1 billion in revenues
Pepsico	$63.5 billion
Coca cola	$35.4 billion
Typson foods	$38.2 billion
Proctor and Gamble	$64.5 billion
Unilever	$60.5 billion
AB InBev	$56.4 billion

Jbs	$49.6 billion
Lo' Oreal	$29.3 billion
Philips Morris	$28.7 billion
Source: https://corporatefinanceinstitute.com/resources/valuation/fast-moving-consumer-goods-fmcg/	

Table. 2.1: Most popular brand names of FMCG sector

Meaning of Workflow

A workflow is defined as a series of tasks that process a set of data along a predetermined route from beginning to end. Workflows (Fig. 2.2) describe the steps that anything takes to progress from being unfinished to finished or unprocessed to processed. Regardless of the industry, they can be used to organise any kind of company operation. Essentially, a workflow is established whenever data is transferred between people or between systems.

Examples of common workflows include the off-boarding of employees, IT service requests, customer help desk requests, purchase order requests, and reimbursement requests.

Fig. 2.2: Workflow

IMPORTANCE OF INDIVIDUAL WORKFLOW HANDLING

Workflow handling is the process of designing, creating, executing, and monitoring workflows. Creating a workflow is important, but it may be difficult; it's like arranging the largest reception in history while coordinating all of the plates, napkins, glasses, drinks, and countless other things.

TYPES OF WORKFLOW

Three types of workflow that can be used in the business are:

1. **Process workflow:** When a set of jobs is predictable and repeatable, a process workflow occurs. A workflow for approving purchase requests is an illustration. Once it initiates, the workflow needs very little modification and can handle any number of objects in a single workflow.

2. **Case workflow:** In this workflow, the starting path needed to finish the items is unknown. When more data is gathered, the way becomes clearer. Insurance claims and support tickets are two cases in point.

3. **Project workflow:** Similar to procedures, projects follow a structured path. However, there may be high flexibility along the way, that works for just one thing.

Categories of workflow

Following are the categories of workflow:

1. **Sequential workflows:** the kind of workflow where the success of the prior activity is required for the succeeding tasks. For instance, you must wait until your manager and the finance department have authorised your request for leave. Before it gets to the finance department, your boss must authorise it.

2. **Parallel Workflows:** a workflow in which several jobs can be completed simultaneously. For instance, while onboarding a new employee, the HR department can simultaneously ask the IT team for software and hardware assets and ask the finance and legal teams for other documentation, signatures, and contract-related papers. These processes can occasionally be dependent on one another.

3. **State machine workflows:** This kind of workflow involves moving from one state to another. Workflows for state machines can occasionally be circular, which makes them more complicated.

4. **Rules-driven workflow:** Sequential workflows that employ rules to advance are the foundation of rules-driven workflows.

WORKFLOW PROCEDURE

A workflow consists of a number of processes that must proceed in a specific order. While on the surface, this may appear simple, there are a different number of procedural challenges that one can encounter.

Lack of accountability, poor teamwork, an inability to delegate, exceeding deadlines, bottlenecks and redundancies, and failing to account for ad-hoc requests are just a few of the prevalent workflow issues.

Human-Centric Vs System-Centric Workflows: The majority of the tasks in processes that are focused on people are given to people. They can call for approving data, producing something fresh, or verifying data. Most tasks in system-centric workflows are completed by machines with little or no assistance from humans.

Document Centric Workflow: There are workflows that are entirely centered around a document, known as document-centric workflows. A lease for office space is an excellent illustration.

Automated Vs Manual Workflow: A person is in charge of moving each item

manually from one activity to the next. For instance, an employee must email his/her management for approval after completing a refund claim form. He/she has to email the finance division once it has been approved. The finance department must schedule a payment using the programme before emailing the employee to let them know it has been completed.

When a human completes a task in an automated workflow, he/she is not in charge of transferring the data to the subsequent task. It is programmed into the workflow to manage this. The system controls how tasks are completed, including managing notifications, due dates, and reminders.

WAREHOUSE FMCG GOODS MOVEMENT PROCESS

The six basic warehouse operations are receiving, storage, packing, picking, and shipping. Warehouse operation can be streamlined, costs and errors can be decreased, and a better perfect order rate can be attained by optimising these six operations.

1. **Receiving:** Transferring ownership of the products to the warehouse is another aspect of receiving. As a result, the warehouse is responsible for keeping the items in good condition up until they are dispatched. It can screen out faulty goods and escape obligation for them by properly receiving cargo.

2. **Put-Away**: The second warehouse procedure, put-away, includes the moving goods from the receiving dock to the warehouse storage site. The productivity of a warehouse operation might be hampered by fading to store goods in their most advantageous location. Proper storage of products has many advantages, including quicker and more efficient storage of cargo, reduced travel time, assurance of the safety of both staff and goods, maximum use of warehouse space, and quicker and easier tracking, retrieval, and finding of cargo.

3. **Storage**: Storage is the step in a warehouse where products are placed in the best storage location for them. When carried out correctly, the storage procedure completely utilises the space that is available in the warehouse and improves workers' productivity.

4. **Picking:** To fill customer orders, the picking procedure involves gathering merchandise in a warehouse. As the most expensive process in the warehouse, accounting for up to 55% of all operating costs, streamlining this process will enable you to drastically save costs and boost warehouse productivity. As errors can negatively affect your customers' satisfaction, streamlining this procedure should also concentrate on obtaining improved accuracy.

5. **Packing:** Packing is the warehouse procedure that assembles selected items in a sales order and gets them ready to be shipped to the consumer. Ensuring that damage is minimised before the items leave the

warehouse is one of the main goals of packing process. The packaging also needs to be basic and light enough to keep packing expenses under control while not adding to the weight of the items.

6. **Shipping:** The first step in the process of moving items from the warehouse to the client is shipping. When the proper order is loaded and sorted sent to the proper addressee, transported via the proper system of transportation and delivered promptly and safely can shipping be deemed successful. Ordering, put away, picking, and packing are earlier procedures that are similarly crucial to the success of shipping since they have a significant impact on how precisely and securely the order is filled.

MEANING AND TYPES OF CODING SYSTEM

A coding system is a plain list of classes or a categorial structure where all classes assigned by some unique symbol sequence (Fig. 2.3).

Fig. 2.3: Coding System

Coding means assigning a code to a product. It may view some of the item's key details using this code, including its SKU, ingredients, level of hazard, warehouse coming date, packaging, and expiration date, among other information. Coding's goal is to make products identifiable in a singular way (two things cannot share the same code). WMSs (warehouse management systems) are essential to this procedure.

Benefits of coding and labeling products

Every part of the supply chain, from the producer to the final consumer, can greatly benefit from coding. It enables firms to rapidly discover and ship products, as well as learn the condition of their inventory.

Hence, identifying products with codes and making sure they are appropriately identified offers the following advantages, including traceability, real-time inventory control, deeper business knowledge, effective order preparation, and error-free procedures.

Item coding methods and standards

The most common are numeric coding (only numbers used), alphabetic coding

(combination of letters, signs and numbers) and alphanumeric coding (only letters). If a business chooses to implement its own coding system, it should be simple to use for all staff members. To make them simple to understand and write. Codes should be brief and consistent in length.

The next step is to label the goods after the type of coding has been decided. The barcode, which is the most widely-used method of representing a code in a warehouse, is useful in this situation. This approach is rapid and accurate because the laser scanner is responsible for scanning the bars and translating them into their alphabetic equivalent.

Although there are more recent options like QR codes and RFID tags, it is difficult to surpass the efficiency and simplicity of barcodes.

Coding: order and control

Coding is the definition of control and structure. Having all the objects identified results in considerably better storage management. The most obvious benefit is traceability, which records each time a product moves along the supply chain.

COMPANYS POLICY AND WORK INSTRUCTION ON QUALITY STANDARD
The organisational structure, roles, tasks, protocols, and resources for putting quality management into practice are referred to as a quality system. A company's total profitability and product quality are directly impacted by warehouse management. No matter from where a product's components are derived, they all represent the business that is selling it. As a result, quality control in the supply chain procedure is necessary to maintain a competitive advantage in the market while reducing operational costs. Waste accumulates to an intolerable degree in the absence of quality management. As a result, thoroughly reviewing the components of quality management systems will assist your organisation to avoid and handle a variety of QC-related difficulties. The Importance of Quality in Warehouse Management:

• Considering issues like customer complaints, prompt shipment and delivery, adequate paperwork, accurate loading and labelling, processing of special requests in a timely and efficient manner, etc., it helps to maintain and improve consumer happiness and perception.

• It helps to avoid a variety of internal and external management issues and deters complaints.

A seamless and effective quality control method also guarantees the best possible use of the time required to carry out all of the warehouse management activities.

Factors to Ensure Quality Check

The procedures used to make sure that products fulfill quality standards are known as warehouse check control procedures. A quality check is an organized

method of keeping an eye on and gauging the caliber of your items so you may adjust them as needed. Following are the factors to ensure Quality Check (Fig. 2.4):

1. **Defect Check**: To make sure raw resource criteria are met, warehouse staff members constantly verify suppliers and the products they offer. By raising the degree and caliber of production variables, managers protect the legitimacy of their company's operations.

2. **Supplier Check**: Consumers who are forced to return goods gradually lose trust in the company from which they made the purchase.

3. **Process Check**: Audits of supply management and quality control systems are essential for preventing ongoing checks on the production line.

4. **Toxic Materials Check: Dangerous compounds are employed in manufacturing across industries and nations of the world for a variety of purposes, especially in the security sector.**

Fig. 2.4: Quality Check

WAREHOUSE EQUIPMENT

1. **Dock Equipment:** Goods vehicles (often rail or road) are loaded and unloaded in a building's loading dock or loading bay. The loading and unloading activities are made easier by dock equipment. The inappropriate dock equipment selection might endanger workers. The safety of the docking area should always come first because it serves as the intersection of the shipping and receiving processes.

The correct dock equipment (Fig. 2.5) may make the operation more effective, flexible, and safe as well as less time-consuming for workers as vehicle designs keep evolving and safety becomes a major

issue. Several dock equipment types comprise of:

• Dock Boards and Plates

- Edge of Dock Levelers

- Dock Bumpers

- Yard Ramps

- Wheel Chocks

- Dock levelers & Dock Lifts

Fig. 2.5: Dock Equipment

2. **Conveyor:** A typical type of mechanical handling equipment that transports things from one place to another is a conveyor system. To reduce time and labor costs, they can automate and/or speed up the process. Conveyors lessen the need for human interaction, which lowers the danger of accidents. Although they could be costly, their advantages will outweigh their costs. Some examples of conveyors are:

- Belt conveyors

- Flexible conveyors

- Vertical conveyors

- Spiral conveyors

- Pneumatic Conveyors

- Chain conveyors

3. **Storage Equipment:** Choosing the correct storage equipment (Fig. 2.6) will enable you to utilise your warehousing space to the fullest. It will also make damage easier to identify and lessen. The most popular storage devices include:

- Carousel

- Racks

- Shelves

Fig. 2.6: Warehouse Equipment

4. **Lifting Equipment:** There are several machines that facilitate efficient products storage and transportation. They ought to be sturdy and sufficient for the products that will be transported. The type of inventory should only be taken into account after choosing the lifting equipment. Several lifting apparatuses include:

   - Forklifts

   - Pallet Jacks

   - Hand Trucks

   - Dollies and Castors

   - Service Carts

   - Cranes, Hoists, and Monorails

5. **Packing equipment: One of the most crucial procedures in the shipping and storage of any goods is packing. It involves protecting a product with packaging or creating a transport-friendly container. Packing tools make the job of the crew easier and boost production. They also improve consistency in the wrapping process and lower labor expenditures.**

   Types of packing equipment are:

   - Industrial Scales

   - Stretch Wrap Machines

   - Strapping and Banding Equipment

   - Packing Tables

Use of Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) is a clothing or an apparatus intended to lessen an employee's exposure to physical, chemical, and biological risks while on the job. When administrative and engineering controls are unable to decrease hazards to acceptable levels, it is utilised to protect employees.

PPE Safety Requirements

Safety officials must take the following actions to encourage PPE safety (Fig.

2.7) at work:

- Regularly assess the requirement for PPE on the job site.
- If PPE is required, give workers correctly fitting PPE.
- Inform staff members of OSHA PPE requirements.

Fig. 2.7: Work Clothes Set

- If there is a risk of flying debris or caustic compounds, provide safety eyewear or face shields.

- In workplaces where there is a chance of burns, eye punctures, abrasions, or contusions, safety goggles must be worn at all times.

- In situations where workers might be cut or exposed to corrosive liquids, chemicals, blood, or other possibly infectious materials, provide and mandate protective gloves.

Require the use of foot protection when there is risk of foot injury from hot, corrosive, or poisonous substances, and falling objects.

Material Handling Equipment (MHE)

Material Handling Equipment (MHE) is employed in the handling of finished items throughout storage, transport and distribution. MHE (Fig. 2.8) is necessary for all of a supply chain's physical components, to put it briefly. To reduce costs and maintain a high level of service, efficient material handling utilising the right material handling equipment is required across the supply chain.

Fig. 2.8: Material Handling Equipment

Certain material handling machinery, such as specific conveyor belts or rollers, uses friction or gravitational force, depending on the kind of items handled, to move the merchandise.

Equipment used for material handling often consists of the following:

Pallet trolley options include manual, battery-powered, and are operator-controlled. Forklift and reach truck are also available. Robotics, crane, lift, conveyor system, protective covers and safety equipment.

1. **Manual Pallet Trolley:** Pallet trolleys that are moved by hand have wheels and a powerful fork up front.

2. **Battery-Powered Pallet Trolley:** On the other side, a pallet trolley with batteries built into it can move, lift, and lower pallets using electric power.

3. **Forklift and Reach Truck:** Forklifts, often known as lift trucks, are powered industrial vehicles used to raise, lower, and transport items across short distances or inside of warehouses. Loads up to 50,000 kg can be carried by forklifts. The powerful ones are used to transport freight containers and other items.

4. **Crane:** The bridge crane and the jib crane are the two types of cranes most frequently employed in warehouses.

5. *Bridge Cranes: In manufacturing and assembling, bridge cranes are*

typically used to lift and transport big, heavy products. It is made up of two tracks that typically run the length of the warehouse and a hoist on a bridge.

6. ***Jib Cranes:*** *Jib cranes are hoists mounted on booms or jibs that are often fastened to a wall or a reliable vertical post. Since the hoist only moves along the length of the boom, its access area is constrained.*

7. **Lift:** Little platforms called lifts can be moved around manually or using a motor. They are used to transport items up or down a vertical axis, where they are then placed on a pallet trolley for further positioning.

8. **Conveyor System:** This is an additional piece of machinery used to transport things down a metal or rubberised belt. In a warehouse or an assembly line, conveyor systems typically move things horizontally between fixed points.

9. **Robotics:** These days, it is common to see robots or machines that carry out some of the jobs that humans used to do. They are especially helpful when performing repeated chores or when working in dangerous environment.

10. **Protective covers and safety equipment:** Certain items need to be shielded from the elements, especially when being transported, including rain or sunlight. The simplest and most popular way to safeguard such goods is to keep them covered. Often, heavy-duty sheets composed of tarpaulin, nylon, or plastic are employed for this purpose.

11. **Personal Protective Equipment while handling goods:** MHE should only be run by qualified personnel. Personal Protection Equipment (PPE) must be utilised to shield the operator from harm or mishaps. PPE consists of goods like hard hats or helmets, safety gear like gloves, masks, and protective clothes. They offer defense against flying items, heat, electricity, chemicals, or airborne particulates.

DOCUMENTATION FOR FMCG WAREHOUSE GOODS MOVEMENT

The warehouse issuing document that certifies the transfer or release of goods is called a waybill. The waybill, which lists the load, weight, size, final destination, and other details of the items being transported, is also known as the carrier document (Fig. 2.9). It serves as the delivery paperwork that must be shown to the receiving warehouse as a result.

1. **GRN:** It serves as the foundational document for financial transactions including paying a supplier or forwarder and creating an accounting entry.

Fig. 2 9: Documentation for FMCG Warehouse Goods Movement

2. **Bin/Stack Card2:** Bin/Stack Cards are standard UNHCR documents that are fitted to an item bin/stack in the warehouse. The card displays the starting balance, movements, in and out, and the current balance of an item at any given time. One bin/stack should only comprise one kind of item from one unique Purchase Order (PO) number.

3. **The Stock Card:** It is a standard document which combines the information of multiple bin/stack cards linking to the same.

4. **Incoming shipment report:** A standard UNHCR document that lists every (weekly) incoming shipment to a warehouse by item, Waybill/consignment, and PO number is called the Incoming Shipment Report.

5. **Outgoing shipment report:** The Outgoing Shipment Report is a standard UNHCR document summarizing all (weekly) outgoing shipments from a warehouse by Waybill/consignment and PO number.

Stock report: The Stock Report is a non-standard document used to report the inventory position or holding for all inventory goods by PO, at warehouse level.

Activities

Activity: Identify and list out the documentation and coding for FMCG warehouse goods movement process in a logistic retail lab.

Materials Required: Notebook, checklist, FMCG coding system, documentation equipment.

Procedure:

1. Make a group of 3 to 4 students.

2. Ask them to visit a retail lab.

3. Ask them to identify the following:

   a) Coding requirements for storage of FMCG goods.

   b) Various types of coding in a FMCG warehouse.

   c) 10 FMCG items for coding and labelling purpose.

4. Ask them to prepare a list of following:

   a) The various types of coding in a FMCG warehouse.

   b) The FMCG items for the purpose of coding.

5. Ask them to perform coding activity in a retail lab for 2-3 days.

6. Review daily plan for goods.

7. Prepare a brief report on documentation and coding for FMCG goods.

8. Submit a report to the teacher.

Activity 2: Prepare a chart on documentation of FMCG goods in warehouse.

Materials Required: notebook, pen, pencil, paper, drawing sheet, colors.

Procedure:

1. Ask students to collect all the materials.

2. Prepare notes on various documents of FMCG goods.

3. Ask them to prepare a chart on documentation of FMCG goods in warehouse.

   a) GRN

   b) Bin/Stack Card2

   c) The Stock Card

   d) Incoming shipment report

4. Write down in notebook.

5. Prepare an attractive chart on it.

6. Submit the chart to the teacher.

Check Your Progress

A. Fill in the Blanks

1. A workflow_____ is defined as a series of tasks that process a set of data along a predetermined route from beginning to end.

2. When a set of jobs is predictable and repeatable, a _____ process workflow occurs.

3. Similar to procedures, _____ follow a structured path, however there may be high flexibility along the way.

4. _____sequential workflow is the kind of workflow where the success of the prior activity is required for the succeeding tasks

5. _____parallel workflows in which several jobs can be completed simultaneously.

B. Multiple Choice Questions

1. Which of the following statements is correct?

    a) A workflow is defined as a series of tasks that process a set of data along a predetermined route from starting to end.

    b) Creating a workflow is waste of time.

    c) Packing is the marketing tool.

    d) Coding is not necessary.

2. Which of the following includes lifting equipment?

    a) Forklifts

    b) Service carts

    c) Cranes

    d) All of the above

3. Which of the following is a type of packing equipment?

    a) Industrial scales
    b) Strapping and branding equipment
    c) Packing tables
    d) All of the Above

4. .... is clothing or apparatus intended to lessen an employee's exposure to physical, biological risk and chemicals while on the job

    a) RR
    b) PPE

c) PP

d) RPE

5. Which of the following statements is correct?

a) There is a need to handle equipment properly.

b) It is essential to follow safety rules in warehouse.

c) MHE is employed in the handling of finished items throughout storage, transport and distribution.

d) All of the above.

C. State whether the following statements are True or False

1. A workflow consists of a number of processes that must proceed in a specific order.

2. There are workflows that are entirely centered around a document, known as put away centric workflows.

3. Transferring ownership of the products to the warehouse is another aspect of dispatching.

4. The Customers are typically given product information by a sales associate to help them make the best purchase decision.

5. Customers must be enthusiastic about the potential of the product they wish to purchase.

6. Storage is the step in a warehouse where products are placed in the best storage location for them.

D. Short Answer Questions

1. What do you understand by FMCG goods?

2. Define various types of FMCG.

3. Describe work flow.

4. What is Put away?

5. Describe storage of goods.

E. Long Answer Questions

1. Explain the importance of individual workflow handling.

2. Elaborate various types of workflow.

3. Explain workflow procedure.

F. Check Your Performance

1. Demonstrate the PPE while handling goods.

2. Spell out the warehouse FMCG goods movement process.

Session 2: Picklist and Information Processing Devices

Pick lists become more crucial when the volume of inventory held, the average number of products per order, the number of Stock Keeping Units (SKUs) sold, the number of channels used for sales, and the complexity, time commitment, and error-prone nature of the selecting process, all increase. The number of pick lists that can be finished every hour will vary depending on the warehouse's size, effectiveness, and layout.

A key component in providing speedy information is an information processing device. These are the parts of the computer system that handle information processing. To make the work easier, a picklist information processing device is used.

MEANING OF PICKLIST

As the volume of inventory held, the number of SKUs sold across channels, the average number of products per order increases, and the selecting process becomes more difficult, time-consuming, and error-prone, pick lists become increasingly crucial. Depending on the size, effectiveness, and architecture of the warehouse, a different number of pick lists can be finished per hour.

A crucial part in providing timely information is played by information processing equipment. These are the elements in charge of how the computer system processes information. A picklist information processing device is utilised to simplify the work.

TYPES OF PICK LIST

Choice lists should be unambiguous and simple to comprehend. There are different ways to offer selection lists.

There are two types of pick lists which are given below:

1. **Physical pick lists**: Printing picklists is still a common method of creating them. Prior to the widespread usage of integrated software, Wi-Fi, and mobile technologies, warehouses use manual pick lists that are given to each picker on a separate piece of paper.

2. **Digital pick lists**: When tablets, smartphones, and computers are used on the warehouse floor, digital pick lists are employed (Fig. 2.10). Each picker receives their assigned order data automatically, and they can then use their devices to follow the instructions for a more effective operation. Further information, such as product photos, validation, and additional quality control, can be included on a digital choosing list much more readily.
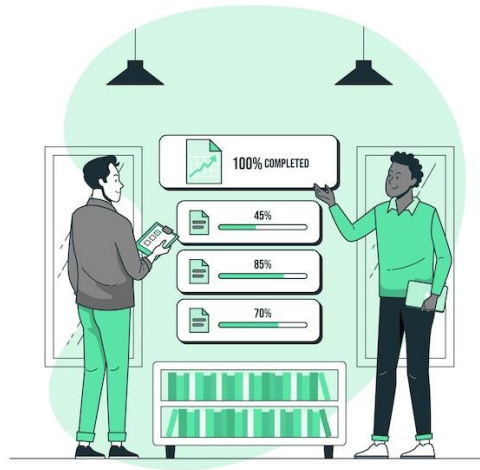
Fig. 2.10: Picklist

ESSENTIAL COMPONENTS OF PICK LIST

1. **Customer information:** The warehouse picking list must include information that will be used later in the fulfilment process if the person is utilising a manual technique rather than a digital pick list to communicate information. While packers or labelers will need the customer's name and delivery address to validate the order details as a measure of quality assurance, pickers do not need to provide any customer information.

2. **Date and time of the order**: Various ecommerce businesses have service level agreements with their customers related to shipping orders out the similar day they are placed before a certain cutoff time.

3. **Order number**: The order number that is linked with each pick list may be referenced by the customer in case there is any matter that arise for example an item that requires to be returned or a shipment that never arrived. The more digital this process is the more transparency and visibility it is at each step of the fulfillment process to comprehend where something may have gone wrong.

4. **Product location in the warehouse**: Picking cannot be a guessing game so there is a need to provide information about the location of a particular item as possible.

5. **Product SKUs**: A SKU (stock keeping unit) is the unique identifier that shows a specific product. For example, for selling shirts there is a need of a different SKU for each size. Some orders will take more than one of a certain SKU so must pay attention to both the amounts and SKU in every order. It is simple to combine products particularly when the identifier is a long arrangement of numbers.

Another reflection beyond the picking list is if there is a barcode on the product itself, or if there is just a unique bin number, sticker or barcode on the product. Clear signage and organised shelves or racks assist confirm picking products from the correct bin or shelf. A Description or photograph of the product: Some products look incredibly same to one another so having additional context such as a description or photo is another manner to confirm pickers are retrieving the correct products.

SAP MATERIAL PICKLSIT TRANSACTION CODES

S. No	T codes	Description	Functional area
1	LX21	*pick list* for Several Transfer Ord.	LE - Warehouse Management
2	MIGO	Goods Movement	MM - Inventory Management
3	MD04	Display Stock/Requirements Situation	PP - Master Data
4	MMBE	Stock Overview	Logistics - Material Master
5	VL02N	Change Outbound Delivery	Logistics Execution - Shipping
6	VL01N	Create Outbound Dlv. with Order Ref.	Logistics Execution - Shipping
7	CO02	Change Production Order	PP - Production Orders
8	CO01	Create production order	PP - Production Orders
9	LT03	Create TO for Delivery	Logistics Execution - Warehouse Management
10	MF60	Pull *list*	PP - Repetitive Manufacturing
11	LT12	Confirm transfer order	LE - Warehouse Management

12	COR1	Create Process Order	PP - Process Order
13	COR2	Change Process Order	PP - Process Order
14	CO27	*pick*ing *list*	PP - Production Orders
15	MB56	Analyze batch where-used *list*	LO - Batches
16	VL06P	*list* of Outbound Dlvs for *pick*ing	LE - Shipping
17	MB5C	*pick*-Up *list*	MM - Inventory Management
18	MIRO	Enter Incoming Invoice	MM - Invoice Verification
19	PFCG	Role Maintenance	Basis - ABAP Authorisation and Role Management
20	SE38	ABAP Editor	Basis - ABAP Editor
21	SE11	ABAP Dictionary Maintenance	Basis - Dictionary Maintenance
22	SE80	Object Navigator	Basis - Repository Browser
23	F110	Parameters for Automatic Payment	FI - Financial Accounting
24	ME21N	Create Purchase Order	MM - Purchasing
25	SE16	Data Browser	Basis - Workbench Utilities
26	SE37	ABAP Function Modules	Basis - Function Builder
27	SE63	Translation: Initial Screen	Basis - Translation Tools

| 28 | VF01 | Create Billing Document | SD - Billing |
| 29 | NACE | WFMC: Initial Customising Screen | SD - Output Determination |

MEANING OF INFORMATION PROCESSING DEVICES

When a computer obtains data from an input device for example keyboard it goes through an intermediate stage before it is sent to an output device, for example; monitor (Fig. 2.11).

A processing device is any hardware inside a computer that interprets and deploys or operates incoming data during this phase. Example, CPU is the processing device.


Fig. 2.11: Information Processing Device

USES OF VARIOUS INFORMATION DEVICES

Barcode Scanners

A barcode scanner is an optical scanner that can read printed barcodes, decode the data included in the barcode to a computer. Like a flatbed scanner it includes of a light source, a lens and a light sensor for converting optical impulses into electrical signals. Furthermore, nearly all barcode readers include decoder circuitry that can explain the barcodes image data providing by the sensor and send the barcodes content to the scanners output port (Fig. 2.12).
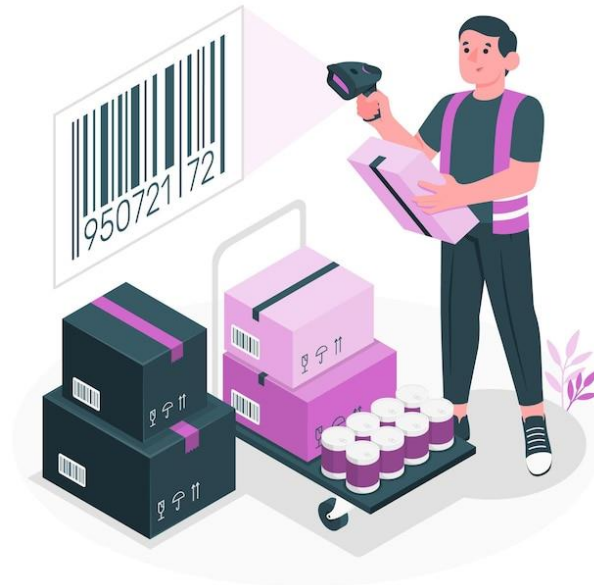
Fig. 2.12: Barcode Scanner

Radio Frequency Identification

Radio frequency identification uses electromagnetic fields to automatically find out and track tags attached to objects.

It includes of a tiny radio transponder, a transmitter and a radio receiver.

When triggered by an electromagnetic interrogation pulse from a nearby RFID reader device (Fig. 2.13) the tag transfers digital data generally a recognizing inventory number back to the reader. This number can be used to track inventory goods.

Fig. 2.13: Radio frequency identification

Methods for Grouping Pick List

Pick to order: This is the fundamental and typical way to pick things in a warehouse. Orders are simply given to pickers as they come in, making it simple to deploy, especially for smaller operations with fewer products. To route particular orders or stock to a specific person, no reasoning is necessary (Fig. 2.14). As a result, it can be less productive in terms of orders picked up per hour and worker output.
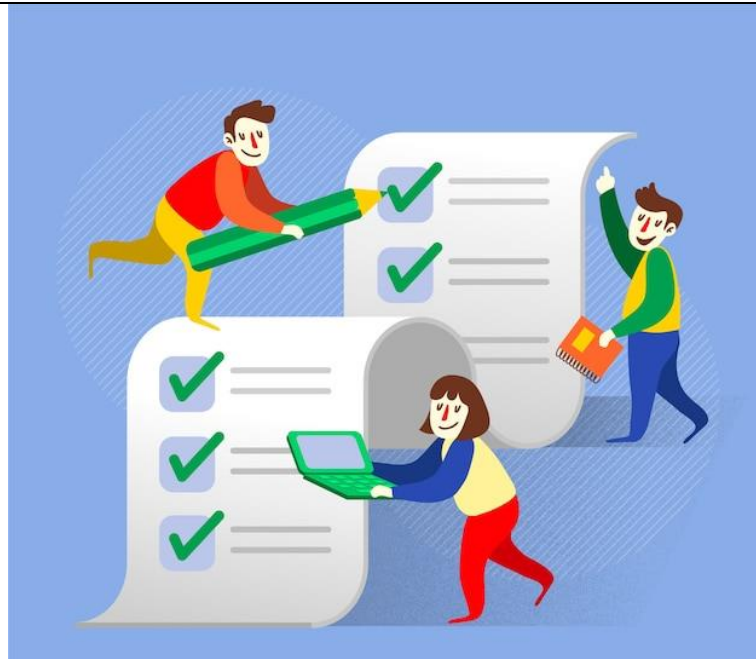
Fig. 2.14: Pick to order

Batch picking: For quickly satisfying a huge number of orders that are similar, batch selecting is ideal. Using a crowdfunding campaign as an example, one person may focus on bulk orders for backer rewards at a similar pledge level. So that they don't have to walk around as much, the picker works the same picks on each order. As every select list uses the same quantity and inventory each time, it also reduces errors.

Multi batch picking: It is a set procedure for selecting items and merchandise for several orders at once. This implies that multiple orders are processed concurrently, resulting in much shorter walking lengths for the picking operator.

Zone picking: Zone picking is a method where pickers remain in specific areas of the warehouse and utilise picking lists based on products or storage. For instance, 100 orders containing products that were all kept in the same rows of bins overnight arrived. The same picker will be given progressively all of these orders so they don't have to cross the warehouse as frequently. In this approach, different tasks are being carried out in different areas of the warehouse to avoid crowding one area and spending more time walking than picking.

PICK AND PASS

Pick-and-pass is a picking method in which pickers are allocated to specific zones within warehouses that have been divided into separate sections. This approach involves picking up every item from a client order that is present in their zone before transferring the order to the following zone so that the pickers there can do the same. Until every item from the order has been picked, this process is repeated.

WAVE PICKING

The order picking system known as wave picking, often referred to as cluster picking, is one of the many employed in warehouses to increase productivity. Based on a common factor like shipment date, like items, warehouse zone, etc., it entails releasing particular orders to the floor for fulfilment.

DOCUMENTATION PICKING

Picking items for sales orders can be done by warehouse staff using control pick lists and pick slips. An item's quantity and location for a sole sales order are listed on a pick slip, a document that comprises details about the goods that need to be dispatched (Fig. 2.15).

The things that must be shipped for various sales orders are listed on a control pick list. A control choose list arranges the elements in numerical order by quantity and position and item sequence. First on the list are the locations with the highest quantity.

Fig. 2.15: Documentation Picking

Control pick lists enable warehouse staff to competently and quickly fill a variety of sales orders. Pick lists cut down on the time, warehouse staff must spend finding the necessary quantities.

These pick slips can be used by the warehouse staff to identify the quantities and items to pack for each of the shipping sales orders. The pick slips help warehouse staff operate more productively because they may pack a variety of orders from one location.

With a packaged pick slip, warehouse staff can select items to complete a certain shipment or load. The pick slip number is assigned by the system based on the shipment or load number, and it prints the total quantity of products in the shipment.

WORK SAFETY AND SECURITY PROCEDURES WHILE PICKING THE FMCG GOODS

To help warehousing staff ensure a safe working environment and reinforce safe conduct while performing in a warehouse, a collection of regulatory rules and industry best practices are known as "warehouse safety." As the occupational safety and health administration (OSHA) (Fig. 2.16) revealed that the warehousing industry's fatal injury rate is greater than the national average for all industries, health and safety should be given top priority for sustainable warehouse operations. following are the OSHA's regulations and standards.

Fig. 2.16: OSHA

1. **Hazard communication:** Warehouse managers should create and put into practice a written hazard communication programmer, and employees who may come into contact with hazardous chemicals should be informed about these substances and how to safeguard themselves.

2. **Emergency Action Plan:** If warehouse owners don't have an internal fire department, they should have a detailed plan outlining what staff members should do in the case of a fire or other emergency.

3. **Fire safety:** If a warehouse hires more than 10 people, the management should keep a written fire protection plan there that is available for staff to review.

4. **Exit routes:** Warehouses should have at least two well-constructed and well-designed emergency exit ways located as far away as practical from each other in case is one is blocked by smoke or fire that are regularly

inspected for safeguards, maintenance and operational features.

5. **Walking or working surfaces:** Warehouse and storage facility workers performing at heights particularly on elevated platforms should have fall protection systems to protect themselves from falls, which is among the leading reason of serious work related deaths and injuries.

6. **Medical and first aid:** OSHA need warehouse operators to offer medical and first aid personnel and supplies adequate with warehouse hazards such as racking and faulty pallet racks falls due to unsafe use of forklifts among others.

Hazards and Controls

1. **Forklifts:** Equipment like forklifts is essential in warehouses and storage facilities. Following these simple warehouse safety guidelines will help you make sure that all forklift operators are qualified and have had formal training. In the event that an operator is seen operating the vehicle unsafely, conduct routine training and evaluation. To check for controls and equipment damage, perform daily pre-start forklift equipment inspections.

2. **Docks:** Being pinned or crushed between a forklift truck and the loading dock is one of the worst accidents a worker could experience while executing their duties in a warehouse. When a forklift veers off the dock and impacts someone, this happens.

3. **Conveyors:** Transporting items from one warehouse to next typically involves the use of conveyor machinery. However, there are major risks for workers when using conveyors, including getting entangled in machinery and getting hit by falling objects. The following must be done in order to ensure warehouse safety:

   a) Ensure that there is adequate protection between workers and conveyors.
   b) While performing conveyor repairs and maintenance, use the correct lockout/tag out procedures.

4. **Materials storage:** For adjacent workers, improperly stacked storage and loads on shelves can result in unintended slip and trip hazards. Maintaining clear, safe aisles and walkways will help keep workers from tripping, slipping, or falling. Heavy weights must be appropriately distributed and positioned, and they must be put on lower or middle shelves. Never forget to get rid of one load at a time.

5. **Manual lifting/handling:** Inappropriate manual lifting and handling is the leading cause of physical injuries in warehouse and storage operations. Musculoskeletal diseases can result from improper technique, especially if

it is done repeatedly with unnatural postures.

6. **Hazardous chemicals:** When handling hazardous chemicals in the warehouse or storage facilities a hazard communication program should be implemented. When handling hazardous chemicals in the warehouse or storage facilities a hazard communication program should be implemented.

7. **Charging stations:** Charging stations in warehouse facilities are used to recharge or refuel all powered to function. Units may be powered by gasoline, liquid petroleum gas or battery.

8. **Energized equipment:** A lockout program must be executed in all operations to confirm that all energized equipment is properly shut off and to stop employees from being caught between mechanical parts or being electrocuted.

Activities

Activity 1: Visit a warehouse to learn picklist procedure.

Materials Required: Notebook, checklist, pen or pencils, FMCG goods, equipment and tools required for picklist.

Procedure:

1. Make a group of 3 students.

2. Ask them to visit a warehouse.

3. Ask them to take permission for the activity.

4. Meet with the logistic executive to understand picklist procedure in warehouse.

   a) Pick to order

   b) Batch picking

   c) Multi batch picking

   d) Zone picking

5. Note down all the points.

6. Prepare a brief report on it.

7. Submit it to the teacher.

Activity 2: Design a Digital Pick List System

Materials Required:

Paper and pens or a computer for designing

Optional: Drawing tools or software for creating a visual representation

Procedure:

1. Students will brainstorm and design a digital pick list system for a warehouse using tablets or smartphones.

2. They need to consider

   a) User interfaces
   b) Information display
   c) Ease of use
   d) Product photos
   e) Validation
   f) Quality control

3. Encourage students to create a visual representation of their digital pick list system, highlighting key components and functionalities.

4. In a group setting, students can present their designs, explaining how their system enhances efficiency and reduces errors in the picking process.

Activity 3: Warehouse Safety Poster Creation

Materials Required: Poster board or paper**,** Markers, colored pencils, or other drawing tools**,** Information on OSHA regulations and standards

Procedure:

1. Students will research and gather information on OSHA regulations and standards related to warehouse safety.

2. Using the gathered information, they will create an informative and visually appealing safety poster for warehouse workers.

3. Encourage creativity in conveying.

   a) Key safety messages

   b) Including illustrations

   c) Easy-to-understand language

   d) Relevant tips

4. In a class presentation, students can explain the importance of each safety measure depicted on their posters.

Activity 4: Perform Simulation of Batch Picking Process

Materials Required:

Various items (can be represented by objects or images)

Paper or cards with order details

Stopwatch or timer

Procedure:

1. Divide students into groups, assigning each group a set of orders (represented by paper or cards) and a list of items (represented by objects or images).

2. Explain the concept of batch picking and its benefits in terms of efficiency.

    a) Increased Efficiency
    b) Reduced Travel Time
    c) Improved Order Accuracy
    d) Lower Labor Costs
    e) Optimized Use of Equipment
    f) Streamlined Operations
    g) Enhanced Inventory Control

3. Each group will simulate the batch picking process, where they need to pick items for multiple orders simultaneously.

4. Time the activity to see how quickly each group can complete the batch picking process.

5. Discuss the advantages and challenges of batch picking based on their experience.

Check Your Progress

A. Fill in the Blanks

1. The number of _____ pick lists that can be finished every hour will vary depending on the warehouse's size, effectiveness, and layout.

2. When tablets, smartphones, and computers are used on the warehouse floor, digital pick lists are employed is _____digital pick lists

3. A _____ is the unique identifier that shows a specific product.

4. A _____device is any hardware inside a computer that interprets and deploys or operates incoming data during this phase.

5. A _____ is an optical scanner that can read printed barcodes, decode the data included in the barcode to a computer

B. Multiple Choice Questions

1. What is the primary purpose of pick lists in a warehouse?
    a) To track employee attendance
    b) To manage financial transactions
    c) To facilitate the selection process in fulfilling orders

d) To organize marketing materials

2. What is a key component in providing speedy information in a warehouse?
   a) Coffee machines
   b) Information processing devices
   c) Manual pick lists
   d) Storage shelves

3. What is the main difference between physical and digital pick lists?
   a) Physical pick lists are handwritten, while digital pick lists are printed.
   b) Physical pick lists are used with tablets, while digital pick lists are on paper.
   c) Physical pick lists are manual, while digital pick lists are automated and electronic.
   d) Physical pick lists are used for large warehouses, while digital pick lists are for smaller spaces.

4. What information is crucial in a warehouse picking list for effective fulfillment?
   a) Customer's favorite color
   b) Date and time of the order
   c) Employee's lunch preferences
   d) Warehouse manager's contact details

5. What is the purpose of using barcode scanners in a warehouse?
   a) To create pick lists
   b) To provide information about customers
   c) To read and decode printed barcodes
   d) To water plants in the warehouse

C. State whether the following statements are True or False

1. An FIDR system includes of a tiny radio transponder, a transmitter and a radio receiver.

2. Pick to order is the fundamental and typical way to pick things in a warehouse

3. For quickly satisfying a large number of orders that are similar, batch selecting is ideal

4. Batch picking is a method where pickers remain in specific areas of the warehouse and utilise picking lists based on products or storage.

5. Pick-and-pass is a picking method in which pickers are allocated to specific zones within warehouses that have been divided into separate sections.

6. Equipment like forklifts is essential in warehouses and storage facilities.

D. Short Answer Questions

1. What do you understand by picklist?

2. Define various types of picklist.

3. Describe essential components of picklist.

4. What is Product SKU?

5. Describe information processing system.

E. Long Answer Questions

1. Explain methods of grouping pick list.

2. Elaborate documentation picking.

3. Explain work safety and security procedures while picking the FMCG goods.

F. Check Your Progress

1. Demosntrate work safety and security procedure while picking the FMCG goods.

2. Demonstrate the use of bar code scanner.

Session 3: Sorting, Placing and Packaging of Goods

In distribution centers or warehouses, items are sorted according to their destinations using sorting devices. Materials are organized randomly into shipping-ready orders. The type of business or supply chain application will determine the location.

Meaning of Sorting System

A courier company's outbound sorter frequently sorts by paths to gather all the materials for one driver. Despite the fact that retail businesses sort the goods by location. Materials can be sorted according to purchase level when looking at e-commerce orders.

The sorter can be applied in numerous ways throughout the supply chain to increase productivity. A sorter can typically be used during the incoming, return, outbound, or shipping phases of the supply chain.

Advantage of a Sorter

• Increases efficiency.

• Permits faster scaling of operation.

• Relieves operators.

• Reduces the number of sorting errors.

• Reduces lead times.

Manual, Semi-Automatic or Automatic Sorting

There is an enormous selection of sorters. Automated sorters include carrier-based sorters like the bomb bay sorter and slide tray sorters as well as conveyor-based sorters like the cross-traffic sorter. Depending on a number of factors, such as the necessary capacity and the available budget, a manual sorting system or semi-automatic sorting system may be chosen. The inventory of sorter variations is endless and ever-growing, but the most typical type includes;

Semi- automatic sorting

- Slide tray sorter

- Split tray sorter

- Vertical sorter (LR sorter)

- Cross track sorter

- Pusher sorter

- Tilt tray sorter

- Pop up sorter

Manual sorting

- Scan to sort

- Screen to sort

- Put to light

- Touch to sort

The Process

Sorters do share a similar trait, and that is the procedure they support and the actions they take to carry it out. It initiates with the substance infeed, also known as picking. To get the goods to the induction zone, the warehouse, inventory, or couriers are contacted. After the materials have been identified, they are fed either directly or automatically into the sorter.

Placing Goods

When goods are subject to the customs warehousing process, they may be moved between the locations listed in the authorisation or from the place where they were put under the process to the premises of the holder of the authorisation.

In a private customs warehouse, the procedure and authorisation are always held by the same person. Before the goods are moved, or at the time they are put under the customer's warehousing process, the authorisation holder is responsible for the goods.

There may be numerous process holders in a public warehouse who are operators aside from the person who holds the license. The movement of the products is the joint responsibility of the process holder and the authorisation holder.

Packaging and Labelling

Packaging is the science and practice of securing or enclosing goods for use, sale, distribution, and storage. Additionally, the term "packaging" mentions to the process of creating and designing containers.

Packaging can be defined as a coordinated system for setting up products for sale, distribution, warehousing, and end use.

Protects, preserves, informs, transports, and offers are all included in packaging. It is completely integrated into government, institutional, commercial, industrial, and personal usage in many different nations.

Any written, graphical or electronic message on the package or on a different but related label is referred to as package labelling or labelling.

Meaning of Packaging

The process of designing and creating a wrapper, box, container, etc. for an object is known as packaging. The main responsibilities, such as product protection, ease of handling, and storage room, should be taken into account when creating a packaging material.

One of the vital marketing tools is packaging because it gives customers their first image of the product, which encourages and motivates them to buy. Simply put, packaging is the process of creating a container where the product is stored to guard it from physical damage while also having to be eye-catching to draw in customers.

Meaning of Labelling

Labeling is the process of displaying all the data and information on the object, packaging, or both. According to the Competition and Consumer Act of 2010, an organisation must comply with and obey to all regulatory requirements when labelling a product, including those regarding ingredients, safety data, and nutritional information. The majority of consumers base their decisions on information found on a product's label.

Types of Label

There are three kinds of label

a) **Brand label:** This part of labelling provides information about the product.

b) **Descriptive:** This specifies the features and aspects of the product.

c) **Grade label:** It specifies the features and aspect of the product.

Difference between Packaging and Labelling

Parameter	Packaging	Labelling
Meaning	It is a procedure of designing and producing a container for a product.	It is a display of all the information on the packaging material.
Purpose	To protect the product, marketing tool, product identification.	To offers product features and influence the customer's decision.
Function	It assists the customers' with the decision-making procedure.	To provide clear information about the product.
Advantages	Facilitates storage product safeguard, assists in the sales procedure, reduce adulteration.	Assists in selling the product by providing clear picture of the product.

Defected or Broken Products

The term "product defect" is used to refer to anything that makes a product not fairly safe in legal contexts involving product safety. Product liability is the area of law that deals with harm created by defective products.

A broad range of circumstances can cause a product to be flawed. The product has a design flaw or design defect as a result of being poorly designed or tested, which results in a product that cannot perform the intended purpose. Even if the design is precise, the product may still have a manufacturing flaw if it was improperly made, such as if the wrong materials were used.

If a product doesn't come with adequate usage directions or adequate warnings about risks associated with proper use or misuse, it may also be deemed legally defective.

Depending on the applicable law, a consumer's failure to peruse the warnings may be used to disprove the cause of an inadequate or defective warning claim in a product liability lawsuit.

Even if a product has a flaw that does not make it dangerous, it may still be offered at a reduced price to reflect the flaw. For instance, if a shift line's inspection by a clothing manufacturer reveals that the sleeves are slightly out of

alignment, the producer may decide to sell these shirts at a discount, frequently through an outlet store, and with the label removed to indicate that the quality is not intended to be replicated on the brand. Rework is appropriate for some goods.

Procedure for Dealing with Loss or Damaged Goods

Businesses must consider a variety of variables that influence profit and loss. Product damage is one issue that many executives have in common. Once damaged, stock is just as valuable as missing goods. In most instances, it might even get worse. Even if the warehouse experiences a 1% loss from damage, the Figures quickly add up over the course of the year. For a given percent worth, a company's losses increase with size.

Additionally, the cost of replacing damaged products is significantly higher than the initial cost. The group not only loses the money it had invested, but also has to make additional investments to make up for the loss. Excessive levels of damage may signal a larger issue with lax safety precautions and necessitate quick action.

Use of the incorrect tools for the quantity of loads or type of stock, improper packing, loading, and securing techniques, as well as poor administration, visibility, and flow of products, all contribute to product damage.

Using the right equipment to prevent for damage

1. **Pallets:** A pallet must be durable for what it carries. Each pallet in use must fit the attributes of its loads and size.

2. **Containers:** A container's key task is to defend packaged goods. It must be durable enough to grasp the size and weight the load that is put into them.

3. **Machinery:** Most damages come to goods when it is in transit even when it moves within the premise. Using the right machine to handle stock when move or place it is an integral step to prevent damage.

4. **Pallet stackers:** Pallet stackers are popular and durable lifting machines. They are small in size and best usage in tight or narrow spaces.

5. **Racks:** Racking also called as shelving is a crucial procedure of warehousing.

Ways to Minimise Damages

1. **Apply Weather Proofing:** The majority of the stock in storage requirements to keep the facility adequately insulated and in an ideal zone. To accomplish this, a warehouse must be protected from the different elements of the outside environment. Extreme weather during peak hot or cold seasons can jeopardize the safety of goods. The facility must be protected from weather variations.

2. **Keep Broader Aisles:** To operate, pallet trucks, stackers, and other equipment require room. Conflicts can arise in confined spaces, making it difficult to work there. Aisle marking and floor safety tape must be used to mark the route and serve as a guide in order to make the area secure.

3. **Usage Signage:** The three segments—packing, storage, and loading—are constantly in contact with one another. The use of signs helps to avoid accidents and other issues.

4. **Train Workers:** The majority of accidents are caused by employees who do not know how to properly carry out a job or use a device. With time, machines will only become more complicated. Workers must be trained and informed about the specifics of their various departments in order to prevent danger. Staff should be instructed on how to use their duties and equipment to avoid them making harmful mistakes.

5. **Light up the Facility:** We are all conscious of how challenging it can be to move or perform tasks in the dark. When there is not enough room, such as in tight corners or aisles, it can become even more troublesome. A lot of accidents can be caused by poor lighting, which also puts staff members at danger.

6. **Load Pallets to Form a Stable Structure:** Having a load stack fall to the ground is another significant factor that leads to product harm and injuries. A building with a weak foundation frequently causes stacked goods to collapse.

7. **Secure Pallets Properly**: Use pallet in a proper manner to avoid damages.

8. **Protect Storage Racks:** Safe racks helps to keep products safely. Smart racking solutions comprises step beams, wire decking, support bars and aisle shields.

9. **Conduct Frequent Inspections:** In every process, minor adjustments and steps are crucial. Products and processes change over time and cease to be comparable. Tools, machines, and tactics all fail as needs change. There is only one way to go about repeatedly verifying on all of these.

10. **Keep it Clean:** Maintaining a clean facility is one of the fundamental methods to prevent damage. It can be easy to trip, fall, or bump into objects when there is clutter. It's simple to leave cartons, wraps, nails, tape, and other supplies lying around. Even though it might not seem like a huge deal, little things can cause big problems and pose a threat. To keep the warehouse secure, a fixed location must be designated for storing empty boxes and bins so that things can be stored there or disposed of.

Activity

Activity 1: Role play on order picking in logistic lab.

Materials Required: Notebook, Pen, Paper, Pencil, FMCG Goods, Tools and Equipment, Documents for Order Picking.

Procedure:

1. Ask students to make a group of 4.

2. Ask them to collect all the materials in a logistic lab.

3. Note down various types of order picking.

    a) Single Order Picking
    b) Batch Picking
    c) Zone Picking
    d) Wave Picking
    e) Pick-to-Light Systems
    f) Voice Picking Systems
    g) Automated Picking
    h) Cluster Picking
    i) Case Picking

    j) Piece Picking

4. Ask them to note down step by step activity for order picking.

5. Perform the role play of logistic executives.

6. Ask each student to perform various types of order picking.

7. Teacher must evaluate the whole activity.

Activity 2: List out safety and security procedures to be followed for picking the FMCG

Materials Required: Notebook, Pen, Pencil

Procedure:

1. Ask students to prepare notes on safety and security procedures to be followed for picking the FMCG.

2. Prepare a list for safety and security procedures.

    a) Personal Protective Equipment (PPE) Usage
    b) Regular Safety Training
    c) Emergency Exit Plans
    d) Fire Safety Measures
    e) Proper Equipment Handling

    f) Hazard Identification and Reporting

3. Prepare a brief report.

4. Submit a report to the teacher.

Activity 3: Design Your Dream Warehouse Board Game

Materials Required: Large sheets of paper or poster boards, Markers, colored pencils, or crayons, Game pieces (small objects, coins, or pieces from other board games), Dice Timer (optional).

Procedure:

1. Divide students into small groups.

2. Provide each group with large sheets of paper or poster boards and art supplies.

3. Instruct them to design a board game that includes elements of warehouse management and safety. They should create a colorful game board with spaces, paths, and illustrations.

4. Each group must establish rules for their board game. This includes

   a) how players move
   b) the objective of the game
   c) any challenges or tasks related to warehouse management and safety

5. Emphasize the importance of incorporating educational aspects into the rules.

6. Each group presents their designed board game to the class.

7. Conclude the activity with a class discussion on what they learned about warehouse management and safety through the board game design process.

Check Your Progress

A. Fill in the Blanks

1. The procedure of designing and creating a wrapper, box, container, etc. for an object is known as _____

2. _____ is the process of displaying all the information and data on the object, packaging, or both.

3. The majority of _____ are caused by employees who do not know how to properly carry out a job or use a device.

4. Maintaining a_____ clean facility is one of the fundamental methods to prevent _____.

5. To operate _____, stackers, and other equipment require maneuvering room.

B. Multiple Choice Questions

1. What is the primary purpose of a sorting system in distribution centers or warehouses?
   a) Enhancing employee communication
   b) Randomly organizing materials
   c) Deciding product prices
   d) Securing storage shelves

2. What advantage does a sorter provide in the supply chain?
   a) Slows down operations
   b) Increases lead times
   c) Reduces sorting errors
   d) Complicates scaling of operations

3. What is a characteristic of a manual sorting system in a warehouse?
   a) Cross track sorter
   b) Bomb bay sorter
   c) Scan to sort
   d) Slide tray sorter

4. What is the primary purpose of packaging in the context of warehousing?
   a) Influencing customer decisions
   b) Displaying information on the product
   c) Creating a coordinated system for product use
   d) Randomly arranging goods

5. What is the key difference between packaging and labeling?
   a) Packaging involves creating containers, while labeling involves designing wrappers.
   b) Packaging is a marketing tool, while labeling is for legal compliance.
   c) Packaging is about information display, while labeling is about product protection.
   d) Packaging and labeling are synonymous terms.

C. State whether the following statements are True or False

1. The sorter can be applied in numerous ways throughout the supply chain to increase productivity.
2. Packaging is the science and practice of securing or enclosing goods for use, sale, distribution, and storage.
3. The three segments—packing, inspection and unloading are constantly in contact with one another.
4. A building with a weak foundation frequently causes stacked goods to collapse.
5. Safe racks help to keep products safe.

D. Short Answer Questions

1. What do you understand by sorting?
2. Define advantages of a sorter.
3. Describe manual, semi-automatic or automatic sorting.
4. What is Placing of goods?
5. Describe packaging and labelling.

E. Long Answer Questions

1. What is labelling? Explain various types of labelling.
2. Elaborate procedure for dealing with loss or damage to goods.
3. Explain sorting and placing of goods.

F. Check Your Progress

1. Prepare chart showing importance of packing and labelling.
2. Perform role-play on sorting and placing of goods.

Session 4: Inventory Management

The process of purchasing, using, storing, and selling an organisations inventory is referred to as inventory management. This includes managing raw materials, finished products and components in addition to storing and processing them. There are several kinds of inventory management, each with advantages and disadvantages depending on a company's needs.

The complete process of managing inventories, from raw materials to completed goods, is known as inventory management. In order to avoid both gluts and shortages, it attempts to effectively streamline inventories.

For major inventory management methods comprises ust in time management (JIT), materials requirements planning (MRP), economic order quantity (EOQ), and days sales of inventory (DSI). There are pros and cons to each of the methods reviewed below:

Advantage of Inventory Management

Inventory is one of a company's most valuable possessions. The main sources of revenue for a company are its inputs and finished goods in inventory-intensive industries like retail, culinary services, manufacturing, and others. When and where merchandise is needed, a shortage can be very detrimental. The risk of theft, spoilage, damage, or changes in demand is higher when there is a big inventory.

Accounting of Inventory

There is a need to keep proper accounting of inventory management systems.

Methods of Inventory Accounting

Inventory is accounted for using one of the three methods:

1. FIFO Costing.

2. LIFO Costing or Weighted Average Costing.

Inventory includes for separate categories:

1. Raw materials: It show various materials a company buy for its production process.

2. Work in progress also called as goods in process: It shows raw materials in the procedure of being converted into a finished good.

3. Finished goods: It is completed products readily accessible for sale a company's customer.

4. Merchandise: It shows finished good a company purchase from a supplier or future resale.

Inventory Management Methods

1. **Just in Time Management (JIT):** This manufacturing model initiated in Japan in the 1960s and 1970s. Toyota Motor contributed the most of its development. The method permits companies to save vital amount of money and decrease waste by keeping only the inventory they require to produce and sell products. This approach decrease insurance and storage costs as well as the cost of discarding or liquidating excess inventory.

2. **Materials Requirement Planning**: this method of inventory management depends on sales forecasts, producers must maintain accurate records to allow accurate planning of inventory requirements and timely communication of those needs to materials and suppliers.

3. **Economic Order Quantity:** Based on the assumption that customer demand will remain constant, this model is used in inventory management to determine how many units an organisation should add to its inventory with each batch order to reduce total inventory costs.

4. **Days Sales of Inventory (DSI):** This financial ratio shows the average time in days that an organisation takes to turn its inventory comprising goods that are a work in progress, into sales.

5. **Inventory Management Red Flags:** If a company frequently switches its method of inventory accounting without reasonable justification, then probably its management is trying to paint a brighter picture of its business than what is true.

FIFO/LIFO

It is used to manage assumptions of costs linked to stock repurchases and

many other accounting purposes. FIFO stands for first-in, first-out meaning that the oldest inventory items are recorded as sold first.

The cost linked with the inventory that was purchased first is the cost expensed first.

Calculation of cost of goods sold under FIFO.

Take out the cost of oldest inventory and multiply the similar with inventory sold

- Industries that use FIFO method of inventory valuation.

- Businesses selling food items.

- Designer fashions.

- Technologies that change at a quick rate.

- Health care products.

A company might use LIFO method for accounting purposes even if it uses FIFO for inventory management purposes. For example, a company that sells various perishable goods such as a supermarket chain, is probable to follow the FIFO method when managing inventory to confirm that goods with earlier expiration dates are sold before goods with later expiration date.

With FIFO the cost of inventory reported on the balance sheet shows the cost of the inventory most newly purchased. FIFO most closely mimics the flow of inventory as businesses are far more probable to sell the oldest inventory first.

LIFO is a last-in, first-out method of inventory valuation. This method is based on the approach that the latest inventory is sold first. This means that the older inventory stays in for a long time.

Calculation of COGS under LIFO

Take out the cost of recent inventory and multiply the same with inventory sold.

Example:

Month	Units	Price
Jan	100	800
Feb	100	815
March	100	825
April	100	825

XYZ Ltd is a retailer selling pen drive Inventory cost as follows:

400 units were attained in total. One can see that the inventory price increased steadily during the quarter. Organisation kept its selling price the similar to remain competitive in the market. Suppose the company sold 250 mobile phone during the quarter. Now let us calculate the cost of goods sold using FIFO and LIFO methods.

FIFO

100 units items at 800 =80,000

100 units items at 815=81, 500

50 units items at 825=41250

Total cost =2,02750

LIFO Method

100 units items at 825=82500

100 units items at 825=82500

50 units items at 815 =40, 750

Total cost 206250

This example represents that the cost of goods sold is higher under the LIFO method. Therefore, for XYZ Ltd. The LIFO method is more suitable as higher cost means lower profits and less payment of taxes.

SOP Inventory Cycle Counting

This method comprises performing a regular count and recording the adjustment of particular products Over time they have counted all their goods.

Warehouse managers and supply chain professionals often develop the plan for staff to audit inventory. The most efficient inventory management plans lead tom minimal transaction error rates and extremely high stock record accuracy without taking away from employee's essential tasks.

Whether an organisation uses periodic or perpetual inventory practices to pathway their regular cycle counting, inventory is a required auditing procedure to manage inventory counts.

Standard Operating Procedure for Inventory Management

The inventory management procedure is a difficult system, specifically for more prominent organisations. Though the basics are the similar irrespective of the size or form of the organisation. Inventory management is the arrangement and control of inventory from the time everything becomes portion of properties until it comes into the hands of the customer. Therefore, inventory management system comprises controlling inventory quantities and also naming inventory. Also, it displays purchase orders, forecasting, reorder dates, pricing, variations,

inventory prices, and arranging all features of the company's most valuable properties.

Reorder level: The reorder level in management accounting is the inventory level in which an organisation places a new order or initiates a new production run.

Inventory Forecasting

Based on how much merchandise is anticipated to sell over a specific period of time, inventory forecasting is a technique for estimating the amount of inventory desired to fulfil prospective customer orders. These projections take into consideration past sales data, outside forces to ensure its accuracy, and upcoming promotions.

Tracking Fast Movers/Slow Movers

Constraint theory is a generally applied approach to the management of business procedure within an enterprise. It is a strategic principle designed to assist companies accomplish their objectives. The principle is to define the organisations objectives explain the variables that impede attainment of those goals and then improve business operations by continually performing to decrease or remove the restricting variables. Fast moving inventory sells within a few days and does not hold stock storage space for long. On the additional side the slow-moving stock is the merchandise that remains locked up in the stores room and has a very low sales rate. Inventories that are more than three months old are generally included.

According to the principle of constraints the best manner for an organisation is to accomplish its objectives is to decrease operating costs, reduce inventory and increase throughput.

Activities

Activity 1: Learn sorting and placing of goods.

Materials Required: Notebook, checklist, pen or pencils.

Procedure:

1. Ask student to make a group of 3.

2. Visit a logistic lab to learn sorting and placing of goods

3. Sort and place materials or items on racks, shelves or in bins according to predetermined sequence such as

   a) Size

   b) Type

   c) Colour

   d) Product code

4. Sort damaged goods.

5. Place the equipment at a suitable place.

6. Teacher must provide assistance to perform sorting and placing of goods.

Activity 2: Identify the procedure for dealing with loss or damage to goods.

Materials Required: Notebook, pen, pencil, paper, computer with internet connection.

Procedure:

1. Ask students to use the internet and collect information on procedure for dealing with loss or damaged goods.

2. Allow them to use the internet and collect all the information.

3. Write down important points.

4. Collect pictures of various equipment and tools for dealing with damage to goods.

    a) Inspection Tables

    b) Damage Assessment Kits

    c) Repair Kits

    d) Protective Padding

    e) Shrink Wrap Machines

    f) Strapping Tools

    g) Tape Dispensers

    h) Pallet Jacks

5. Prepare a chart on procedure for dealing with loss or damage to goods.

6. Paste the pictures on the chart.

7. Complete the chart in an attractive manner.

8. Submit it to the teacher.

Activity 3: Demonstration on packaging and labelling.

Material required: Notebook, pen, paper, pencil, colour, drawing sheet, FMCG goods, packaging cardboard.

Procedure:

1. Ask students to make groups of 3.

2. Ask them to note down important points on packaging and labelling.

a) Use Durable Materials
b) Proper Sealing
c) Clear Labeling
d) Include Handling Instructions
e) Tamper-Evident Seals
f) Consistent Label Placement

g) Barcode Integration

3. Ask the group to Take various FMCG products.

4. Collect all the materials.

5. They must coordinate for the activity.

6. Ask them to first perform packaging task.

7. They must then perform labelling task.

8. Teacher must provide assistance to the students for the demonstration.

Check Your Progress

A. Fill in the Blanks

1. The process of purchasing, using, storing, and selling a company's inventory is referred to as _____ inventory management.
2. _____ is manufacturing model initiated in Japan in the 1960s and 1970s.
3. FIFO_____ stands for first-in, first-out meaning that the oldest inventory items are recorded as sold first.
4. LIFO_____ is a last-in, first-out method of inventory valuation.
5. Cycle counting_____ is a tactic of checks and balances by which organisations authorise physical inventory counts match their inventory records.

B. Multiple Choice Questions

1. Which of the following statements is/are ways to minimise damages?

   a) Apply weather proofing.
   b) Usage signage.
   c) Keep broader Aisles.
   d) All of the above.

2. What of the following is correct?

   a) A pallet must be durable for what it carries.
   b) A container key task is to guard packaged goods.
   c) Racking is also known as shelving.

   d) All of the above.

3. What do FIFO and LIFO stand for in inventory management?

   a) First In, First Out and Last In, First Out
   b) Fast Input, Fast Output and Last Input, Fast Output
   c) First In, Last Out and Last In, Last Out
   d) Fast Input, First Out and Last Input, Last Out

4. In FIFO (First In, First Out), which items are considered to be sold or used first?

   a) Latest items added to inventory
   b) Items in the middle of the inventory
   c) Oldest items in the inventory
   d) Randomly selected items

5. Which method is generally preferred during periods of inflation?

   a) FIFO
   b) LIFO
   c) Both FIFO and LIFO
   d) Weighted Average

C. State whether the following statements are True or False

1. There are several kinds of inventory management, each with advantages and disadvantages depending on a company's needs.
2. With FIFO the cost of inventory reported on the balance sheet shows the cost of the inventory most newly purchased.
3. Cycle counting comprises performing a regular count and recording the adjustment of particular products.
4. The work order lead time in management accounting is the inventory level in which an organisation places a new order or initiates a new production run.
5. Fast moving inventory sells within a few days and does not hold stock storage space for long.

D. Short Answer Questions

1. What do you understand by inventory management?

2. Define advantages of inventory management.

3. Describe LIFO and FIFO.

4. What is inventory forecasting?

5. Describe packaging and labelling.

E. Long Answer Questions

1. Explain inventory management methods.

2. Elaborate SOP inventory cycle counting.

3. Explain tracking fast movers/slow movers.

F. Check Your Progress

1. Practice FIFO/LIFO method with example.
2. Demonstrate SOP for Inventory Management.

MODULE 3	HANDLING OF AUTOMOTIVE GOODS

Module Overview

The automobile industry consists of cars, two wheelers, commercial vehicles, earth moving equipment and other transportation equipment. The parts could be varied from glass windshield to electronic circuits to steel frames to tyres to miniature parts.

In case of automotive packaging there is no "one size fits all" solution. Shipping and handling each part require a different skill set. Among all supply chains, the supply chain of automobile industry is considered to be most complex as it consists of handling varied nature of parts such as raw material, assemblies and sub-assemblies, spare parts and finished goods. The industry is extremely fast paced thus requires process improvement tools such as Just in Time (JIT), Kiazen, Kanban, etc.

The warehouse associate needs to communicate with the transport supervisor to ensure that smooth loading and unloading operation takes place throughout the day. He/she needs to collect details for the same to prioritise the loading/unloading operations. warehouse associate has to prepare for the day's work by getting the job allocation from the supervisor and planning the activities for the day and also requires reporting back to the supervisor daily.

The warehouse associate needs to ensure that the Material Handling Equipment (MHE) and Personal Protective Equipment (PPE) are worn by the supervisors & technicians to carry out the day's load (day's work). Also he/she needs to co-ordinate with the security guards for security related issues and challenges during loading and unloading racking/storing, and in complete inventory management. If in case any security issues needs attention, the warehouse associate needs to fix the issues quickly by communicating with the management.

This unit will focus on how to manage automotive goods in a warehouse. The first session covers the packing and labeling of automotive goods, the second session includes the loading-unloading of automotive goods, the third session describes about inventory management, and the fourth session discusses about the handling of inventory count, dangerous product and reporting daily to the supervisor.

Learning Outcomes

After completing this module, you will be able to:

- Understand the techniques and standards for packaging and labeling automotive products.
- Learn best practices for efficiently loading, unloading, and handling materials.
- Acquire skills in inventory management and the use of process improvement tools.
- Master inventory counting, handling dangerous products, and daily reporting procedures

Module Structure

Session 1: Packaging and Labeling of Automotive Goods

Session 2: Loading-Unloading and Material Handling

Session 3: Inventory Management and Process Improvement Tools

Session 4: Inventory Count, Dangerous Product Handling   and Daily Reporting

Session 1: Packaging and Labeling of Automotive Goods

Packing is a simple form of protection of product. It consists all the materials (boxes, bags, paper, etc.) that are used to cover or protect goods before they are stored/transported or sold. Whereas packaging includes packing (Fig. 3.1) as a protection function alongside it is also used to dissaminate information about the goods and brand, as well as becoming the plumage by which the product stands out on the shelf and convinces the consumer to purchase it. Packaging also helps in exhibiting distinguishing features of that product to attract customers.

Fig. 3.1: Packaging

Whereas de-packaging means remove the packaging or casing and/or separate into components or unbundle the products. For automotive goods labeling is the key that printed labels adhere to the labeled parts and are legible for the lifetime in the automobile. The automotive industry is in constant need of components and parts to assemble their products, which requires packaging, de-packaging and labeling.

MEANING OF AUTOMOTIVE GOODS

All those goods which are involved in the manufacture of components of motor vehicles such as engines, body parts and manufacturing of finished motor vehicle are known as automotive goods. These goods do not include tyres, batteries and fuel.
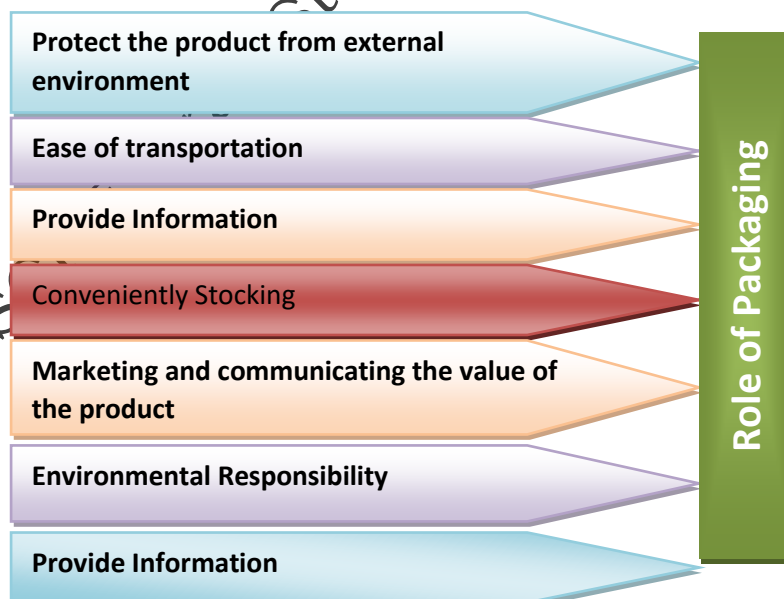
PACKING/DE-PACKING

With reference to automotive goods packing is wrapping or grouping of goods or material in a container for storing in warehouse or transporting the goods/material from one place to another whereas de-packaging means removal of casing and/or separate into components or unbundle the products.

PACKAGING

The dictionary meaning of packaging is the act of putting things in containers for travel or storage. In simple words, packaging is the process of creating and designing the container or material used to wrap a product, also to identify and differentiate the product in the market (Fig. 3.2). Therefore, it helps to-

- Store the automotive product/item.
- Allow ease of distribution and transportation of automotive products.
- Communicate the features of the product.
- Differentiate and identify one product from another.
- Provide instructions for using the product properly.
- Creating public image.

Fig. 3.2: Role of Packaging

There is a difference between packaging and packing. Packing is a subset of

packaging where a product is wrapped and/or put in a container to help with its transit, handling, and delivery. Whereas packaging is a subset of marketing where a product is wrapped or put in container by brand in a way to differentiate with other similar products in the market also it is designed and develops to safely transport, handling, delivery, and communicate the product information by making it look attractive.

The automobile manufacturer uses two types of packaging

- Expendable Packaging: this type of packaging is made up of paper, plywood, wood, or corrugated cardboard which is single use, can be disposed-off once customer receives and opens the packaging (Fig. 3.3).

Fig. 3.3: Expandable packaging

- Returnable Packaging: This type of packaging is reusable in manufacturing and distribution system which includes reusable racks, pallets, pallet collars, bulk containers made up of plastic, steal plywood, etc., and dunnage (Fig. 3.4).

Fig. 3.4: Returnable Packaging

LABELLING

There are variety of the products in the warehouse that require special handling, they may be flammable, fragile, heavy or have limited shelf life. All these can be indicated using labels outside the packaging. Thus Labeling refers to attaching product information, brand information, handling and safety instructions on the package or container of the product (Fig. 3.5).
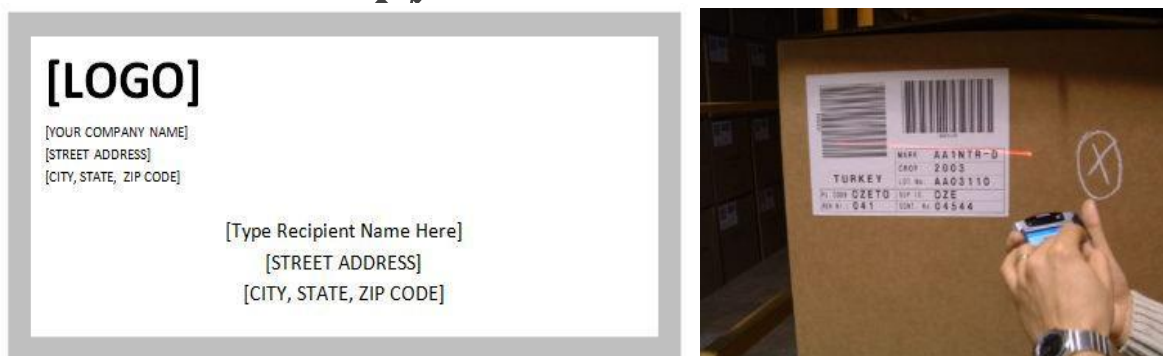

Fig.ure: labeling

Fig. 3.5: Labelling

Labeling system in warehouses is a process for systematic inventory management for efficient and timely distribution facility. As the area of a warehouse is huge, other than product differentiation labeling helps in identifying inventory location which ultimately reduces the time spent on locating various parcels and packages in the rack/shelf. No or bad labeling system will cause errors in detecting goods

and will be time consuming.

Automotive labels actually play an incredibly important role in the auto industry. These labels are identification labels applied during the transport of the product from one place to another place before assembling of the final

product. These labels contain information like tyre pressure, parts numbers, safety and warning labels and should also be able to withstand at high temperature, moisture, vibration fluids and corrosive material (Fig. 3.6).

These labels (Fig. 3.7) carry valuable information that need to retain fully intact and legible for life time. Since it can be used to not only manage inventory but to create traceability in the case of a recall
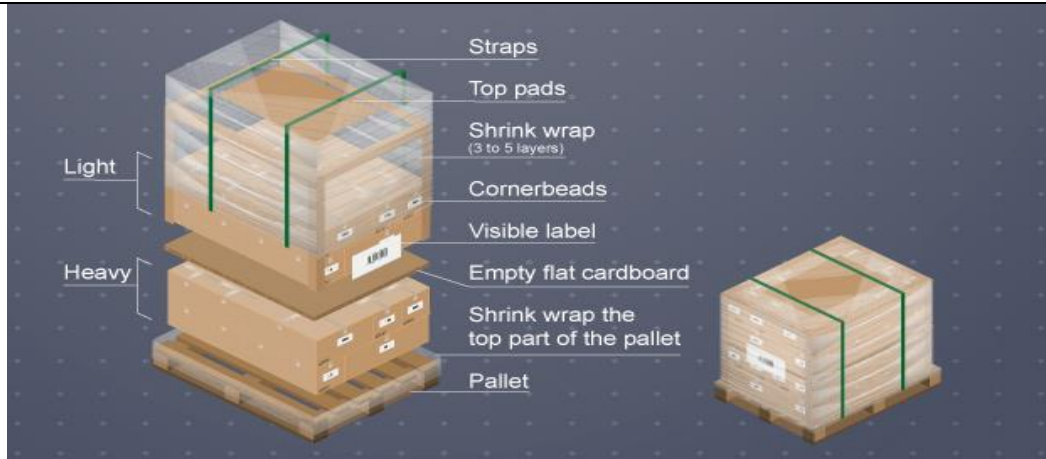

Fig. 3. 6: Automotive Labeling

**Fig. 3.7: Labels of Automotive**

PALLETISATION

Palletisation is the process in logistics which helps in placing automotive products/goods or material together on pallets. This allows easy movement, sorting, consolidation and handling of the product for further transportation and assembling (Fig. 3.8).

Fig.3.8: Goods Palletization

Palletisation also refers as grouping of products in a single pallet (Fig. 3.9).
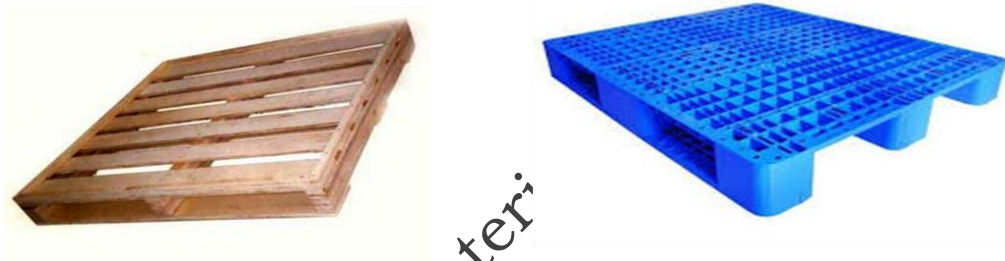
Fig. 3.9: Pallet

Types

The most common types of palletisation are:

1. **Serial palletisation:** In this type the products are loaded onto pallet in a sequence. This approach is frequently used for heavy or bulky products.

2. **Parallel palletisation:** In this type the products are loaded onto several pallets all together. This approach is frequently used to load lightweight or fragile products and need to be transported in hurry.

3. **Hub-and-Spoke palletisation:** In this type of palletisation the products are stacked in large numbers on top of one another of smaller individual boxes to generate broad packages. This approach is used for products that require perfect packaging space or are difficult to move.

Following are the advantages of Palletisation (Fig. 3.10).

Fig. 3.10: Palletisation Advantages

Limitations: Palletisation has several benefits but also has some limitations

- Stacked product are challenging to move.
- Top stacked can get contaminated.

RACKING

It is used to stack or store automotive goods/material in rows horizontally at multiple levels (Fig. 3.11).

Fig. 3.11: Racking

STORAGE SYSTEM

It is a system used to organise and store all automotive goods and material in a secured place for future use. The correct selection of storage system helps in improving efficiency of the warehouse.

Automotive goods are varied in nature and has thousands of parts, in that some are fragile and some with stand lifetime. All these different sizes and shapes of goods/material and parts require different types of warehouse storage systems.

Based on the nature and type of goods, warehouse storage system is selected.

CODING SYSTEM

Coding is the process of applying a symbol or code in alphabetical, numerical or both for clear identification. It is a process of making identification easy to recognise. It helps to find out missing goods if any. Coding is a system of secret communication in which some words, letters, numbers or symbols are assigned specific meanings.

Importance of coding system

Coding system has various benefits in maintaining inventory in the warehouse. These are as follows:

- Standardisation of inventory.

- Identification of stored items.

- Avoiding duplicity of items.

- Facilitating input and output of materials.

- Improving communication among industries.

- Providing technological integration.

- Reducing cost.

- Reducing inventories.

- Reducing record keeping.

- Reducing staff.

- Reducing diversity of supply.

- Recognizing items separately.

- Conveying buying instructions easily and quickly.

CERTIFICATIONS FOR AUTOMOTIVE GOODS

To ensure the automotive goods/material quality, reliability, safety standards and minimising health hazards it is mandatory to have certification of products for the compliance of safety standards by standardisation and testing of the goods and material used in producing final products.

There are certain primary standards which the automotive company should possess to ensure those standards and quality of the goods. There are few certifications which automotive company requires to show their compliance. Among all certifications some important certifications are as follows:

- **IATF 169949**: production process.

- **ISO 9001**: improvement in customer relationship.

- **ISO 1400**: dedication to environmental responsibility.

- **ISO 4500**: wellbeing of its employees.
- **IQNET SR10**: social responsibility.
- **EMAS**: reducing environmental impact.
- **TISAX**: privacy and data processing regulations.

Activities

Activity 1: Perform a role play on packing, de-packing and labeling of automotive goods.

Material Required: 10-12 students, Dummy automotive goods, packing material (wrapping paper, cartons), Sticking tape, Scissor, Labels, Note Book, Pen/Pencil.

Procedure:

1. Perform the role play along with peers and listen to the instructor.

2. Pack the dummy automotive goods in wrapping paper with sticking tape and scissors (narrate the instructions or procedure of packing)..

   a) Store the automotive product/item.

   b) Allow ease of distribution and transportation of automotive products.

   c) Communicate the features of the product.

   d) Differentiate and identify one product from another.

   e) Provide instructions for using the product properly.

   f) Creating public image.

3. After packing in wrapping paper put the packed goods in carton.

4. Pack the carton properly.

5. Stick label on carton.

6. Perform loading and unloading of material/goods as per instruction.

7. Prepare a report and discuss your report in the class.

Activity 2: Perform a role play on racking, palletisation, storing, coding and labeling of automotive goods.

Material Required: 10-12 students for role play, Dummy automotive goods, labeling material, Racks, pallet, Sticking tape, Scissor, Note Book, Pen/Pencil.

Procedure:

1. Perform the role-play along with peers and listen to the instructor.

2. Identify which pallet, rack and storing will be appropriate to use based on

the type of automotive goods/material given.

3. After identifying perform

   a) Palletization

   b) raking and storing of packed goods in the lab/class setting of warehouse.

4. Code the item and stick label on rack/shelves.

5. Prepare a report and discuss your report in the class with the importance of all functions in the warehouse and the role of warehouse associate in it.

Activity 3: Introduction to Packaging and Labeling

Materials Required: Various packaging materials (boxes, bags, paper), Sample automotive goods or images, Labels with information (e.g., safety, handling instructions), Markers, glue, and scissors

Procedure:

1. Discuss the importance of packaging and labeling in the automotive industry with the students.

2. Show different packaging materials and explain their purposes.

3. Have students create their own small packaging for a model automotive product using the provided materials.

4. Discuss the significance of labeling, and ask students to create labels for their packaged products.

5. Display and discuss the students' creations, emphasizing the role of packaging and labeling in attracting customers.

Activity 4: Demonstrate different types of palletization.

Materials Required:

Miniature pallets or cardboard cutouts

Automotive goods models or images

Markers and glue

Procedure:

1. Introduce the concept of palletization and its advantages.

2. Show different types of palletization

   a) Serial

   b) Parallel

   c) hub-and-spoke

3. Demonstrate the process of placing automotive goods on miniature pallets,

explaining the reasons for palletization.

4. Have students try palletizing small automotive product models or images.

5. Discuss the advantages and limitations of palletization with the students.

6. Prepare a scrap book and paste the pallets in the book.

Activity 5: Storage System Design

Materials Required: Miniature racks or shelves, Sample automotive goods or images, Markers, glue, and cardboard, Coding charts from the previous activity.

Procedure:

1. Discuss the importance of storage systems in warehouses for automotive goods.

2. Introduce different types of storage systems

   a) Selective rack

   b) Drive-in rack

3. Have students design and create miniature storage systems for a set of automotive products using provided materials.

4. Encourage students to incorporate coding from the previous activity into their storage designs.

5. Discuss the efficiency and benefits of different storage systems.

Activity 6: Create the importance of certifications in ensuring quality, safety, and environmental responsibility

Materials Required:

Information on automotive certifications

Sample automotive goods or images

Markers and paper

Internet access for research

Procedure:

1. Introduce various certifications related to automotive goods

   a) IATF 16949

   b) ISO 9001

   c) ISO 14001

2. Discuss the importance of certifications in ensuring quality, safety, and environmental responsibility.

3. Have students research and create informational posters about one

certification.

4. Present the posters to the class, explaining the significance of the chosen certification.

5. Discuss how certifications contribute to the overall quality and reliability of automotive goods.

Check Your Progress

A. Fill in the Blanks

1. _____ is a simple form of protection of product.
2. _____ refers to attaching product information, brand information, handling and safety instructions, etc.
3. _____ is the process in logistics which helps in placing automotive products/goods or material together on pallets.
4. _____ is used to stack or store automotive goods/material in rows horizontally at multiple levels.
5. Packing is a subset of _____.
6. The correct selection of storage system helps in improving efficiency of the _____.
7. _____ is the process of applying a symbol or code in alphabetical, numerical or both for clear identification.
8. _____ and _____ palletisation is used for products that require perfect packaging space or are difficult to move using.
9. Warehouse is an important activity of _____ function.
10. _____ packaging is made up of paper, plywood, wood, or corrugated cardboard, etc.

B. Multiple Choice Questions

1. Packing is also used to dissaminate information about

   a) Care and storage.
   b) Goods and brands.
   c) Both (a) & (b).
   d) None of the above.

2. Role of packaging are

   a) Environmental responsibility.
   b) Protecting the product from external environment.
   c) Marketing and communicating the value of the product.
   d) All of the above.

3. Single use can be disposed-off once customer receives and opens the packaging is known as

a) Expendable Packaging.

b) Returnable Packaging.

c) Sustainable Packaging.

d) All of the above.

4. Labeling system in warehouses is a process for systematic inventory management for

a) Errors in detecting goods.
b) Efficient and timely distribution facility.
c) Both (a) & (b).
d) None of the above.

5. Which of the following is not an advantage of returnable packaging?

a) Being environment friendly.

b) Being cost effective.

c) Easy to change.

d) Better protection of parts.

C. State whether the following statements are True or False

1. In automotive goods labelling is not the key that printed labels adhere to the labeled parts and are legible for the lifetime in the automobile.

2. Packing increases, the shelf life of product.

3. Automotive goods include tyres, batteries and fuel.

4. Packaging allows ease of distribution and transportation of automotive products.

5. The automobile manufacturer uses five types of packaging.

6. Warehouse cannot store goods.

7. Stacked products are challenging to move.

8. Returnable packaging is reusable in manufacturing and distribution system.

9. There is no difference between packaging and packing.

10. Palletisation is helpful to reduce cost.

11. Handling instructions of the product are generally indicated on the packaging.

D. Identify the symbols and write its name

1.

2.

3.

4.

5.

F. Short Answer Questions

1. Define packing and de-packing.
2. What are automotive goods?
3. Write the difference between packing and packaging.
4. Write about palletisation.
5. State the limitations of palletisation.

F. Long Answer Questions

1. Explain various types of palletisation.
2. Deliberate the importance of labeling.
3. Explain briefly about racking.
4. Explain the role of packaging?

G. Check Your Progress

1. Differentiate between extendable ad returnable packaging with its role.
2. Identify pallet and racks and explain labelling.

3. Write the difference between packing and packaging.

Session 2: Loading-Unloading and Material Handling

Storage of goods is as important as the manufacturing, marketing and transportation of goods. Storage involves sorting of goods, identification of goods, maintenance of good/material, loading unloading, storage of goods/material on racks, shelves/boxes/containers/fixtures, and verification of material. Therefore, it involves all aspects of material/goods handling at a designated place in a definite time period. Thus, warehousing is a combination of number of activities performed in accordance with each other and requires all sorts of storage solutions for the material/goods and also material handling and personal protective equipment to handle and maintain goods in the warehouse.

WAREHOUSE

It is a specially designated place/commercial place where goods or material is stored. Storage is an essential activity for almost every organisation. There is always a need to store goods to avoid interruption in production cycle. Selection of warehouse and containers/fixture/boxes/racks/pallets are dependent on the nature and type of material or goods to be stored.

MEANING OF LOADING/UNLOADING

Loading and unloading are two important functions of the warehouse. In automotive goods context loading and unloading refers to moving of goods/material on and from vehicle to warehouse or other place.

Following are the examples of good practice of loading and unloading operations:

- Put the vehicle on breaks and chock wheels.
- Park the vehicle to be unloaded at ground level and extend all stabilisers.

General precautions to be taken while loading:

- Vehicle should not be overloaded.
- Heavier load should be placed first and lighter on top of that.
- Balance the weight distribution in the vehicle.
- Stacking arrangement should be stable.

General precautions to be taken while unloading:

- The loads should not shift during transportation.
- All unloading equipment should be in working condition.
- Unloading should be done on flat and firm ground.

MATERIAL HANDLING EQUIPMENT

Material Handling Equipment (MHE) is concerned with the equipment used to move goods from one place to another and storage of goods in the warehouse also control of materials during warehousing, loading and unloading of automotive goods (Fig. 3.13). Some Material Handling Equipment (MHE) used for automotive goods are Electric lift truck, Reach truck, Low lift truck, Aerial work platform, Automatic guided vehicle, Automated storage and retrieval system, Pallets/Automatic pallets, forklift truck, etc. Few of MHE are pictured below (Fig. 3.12):

1	Counterbalanced Fork Lift Truck	
2	Riding Hand Truck	
3	Hand Truck	
4	Tractor Truck for Trailer Trains	

5	Narrow Aisle Straddle Truck		
6	Order Picking Truck		
7	Stacker Cranes		
8	Pallet Positioners For Ergonomic Operations		

9	Unit Load Automated Storage/Retrieval System		
10	Auto Guided Vehicle		
11	Belt Conveyor		
12	Roller Conveyor		
13	Inverted Power and Free Conveyor		

14	Dock Leveler	

Fig. 3.12: Material Handling Equipment

Pallets

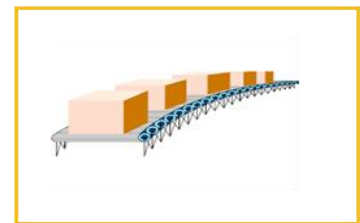
Hand Pallet Truck

Forklift

Battery Operated Pallet Trucks
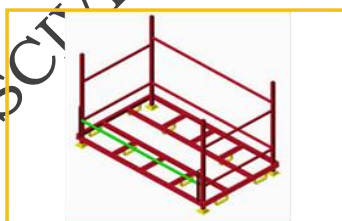

Reach Trucks

Conveyors

Dock Leveler

Stacktainers

Plastic Crates

Returnable Steel Racks

Returnable Plastic Packaging

Collapsible steel Containers

Fig. 3.13: Material Handling Equipment

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal Protective Equipment (PPE) is defined as any clothing, equipment or substance designed to be worn by a person to protect self from the injury or illness. PPE is the last control measure to be used in handling automotive goods. This is because PPE does not change the hazard itself but act as a shield between a person working in warehouse and the hazard (Fig. 3.14).

PPE includes equipment such as safety footwear, hard hats, high visibility waistcoats, goggles, life jackets, respirators and safety harnesses.

Benefits of Personal Protective Equipment

- PPE saves workers in automotive goods handling from the risks of accident or collision.

- It also saves workers from any biological hazard such as allergies, asthma, cut/wound, infection, etc.

- PPE also provides a safe working environment in the warehouse as well as fulfills all work norms in automotive goods handling.
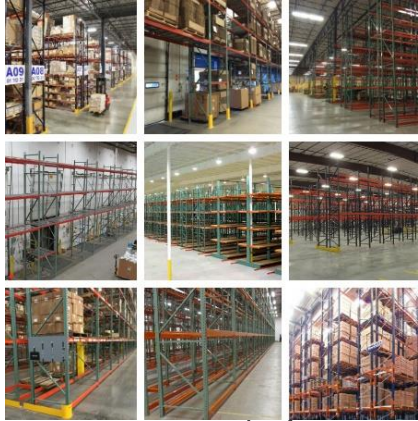
Fig. 3.14: Personal Protective Equipment

RACKING

Racking is used for storing of the material in the warehouse or distribution facility. Various types of raking system are available for storage of material/goods. The selection of right kind of racking is based on the type of material, weight of material and the size of the material to be stored in the warehouse. Following are the types of raking used for storage (Fig. 3.15):

1	Wire Decking-		
2	Cantilever racks- • Improves ease of access, handling efficiencies. • Stores large and/or bulky items.		
3	Drive-in or Drive-thru racking- • Helps in the best use of warehouse space. • Eliminates the need for multiple aisles and can be designed for any pallet size or weight.		
4	Carton Flow- • Ideally for FIFO inventory systems. • Helps to reduce labor costs.		
5	Pallet flow racking- • Provides extra speed and efficiency. • Inclined slots ensures products readily available for picking. • Best for use in first-in, first-out inventory management.		

6	Selective pallet racking- • Most popular storage. • Provides easy access to every SKU of product. • Provides great flexibility for changes in dynamic operation.	

Fig. 3.15: RACKING

STRAPPING AND LASHING

After loading a material, strapping and lashing of cargo is essential to secure load during transportation for its safety and to avoid any damage or accidents during transportation. If a piece of cargo falls off during transit, it may cause severe accidents.

Strapping

Strapping refers to banding material together to form a single and secured unit to move from one place to another. This helps in avoiding falling and dropping of material during transport (Fig. 3.16).

Different types of strapping include steel strap, polyester strap, polypropylene, and nylon strap, paper strap, and composites strap. The selection of the type of strap depends on the requirements such as strength, elasticity, ability to withstand various environments, ease of use, safety, and cost.

Fig. 3.16: Strapping of Goods

All types of tensioned strapping, particularly steel, need to be handled carefully because of potential injury.

Precautions in Strapping

Following precautions need to be taken while Strapping:

1. While strapping the load to the pallet, the strap must be able to hold the

unit on the pallet as a whole.

2. Straps should be checked for any damage before tying.

3. If there is more than one layer of cargo on the pallet, it is better to strap each layer.

4. Proper equipment should be used to pull and tighten the strap. Strap should neither be too loose for the cargo to move or too tight for strap to snap during transit or damage the cargo.

Lashing

Lashing refers to the securing arrangements made for transporting cargos on or in a container using materials like wood, cable, nets, wires and/or chains to safeguard during transit (Fig. 3.17).

Fig. 3.17: Lasing of goods

Precautions in lashing

Following precautions need to be taken while Lashing:

1. The load should be restrained in the container using air bags and other space plugging methods to avoid any free movement of the load.

2. Proper equipment should be used to lash and secure the load.

3. If there is more than one movement, lash must be checked and retightened if required.

4. Ensure that the load is stable before start of the lashing or loosening of strapping at the end.

5. The vehicle body should be strong enough to hold the load being carried.

PROCESS OF LOADING AND UNLOADING

This is a continuous process which requires following safety instructions to secure safe loading and unloading practices. Loading and unloading is done on everyday basis at warehouse. Thus, the process should be done at selected places

only to avoid any mishappening or accidents and the people involved in the process should adhere to the instructions provided by the organisation or supervisor.

Following are the common steps followed in unlading and loading of the automotive goods as shown in Fig. 3.18 & Fig. 3.19:

Unloading of Goods:
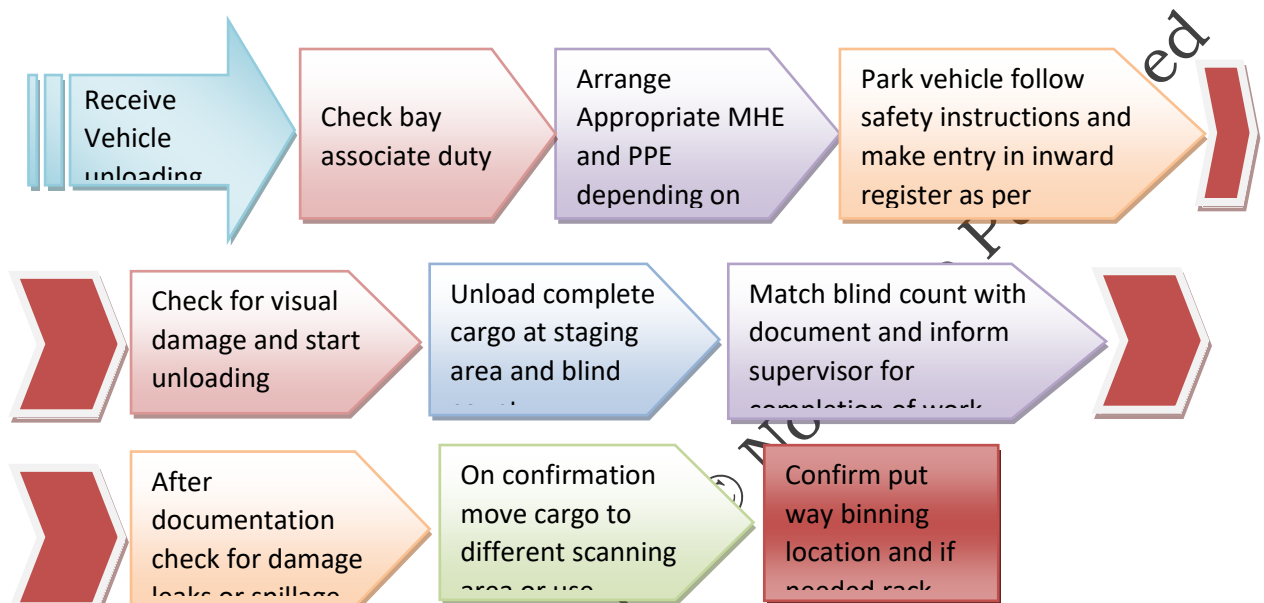
Fig. 3.18: **Unloading of goods**

Loading Process:
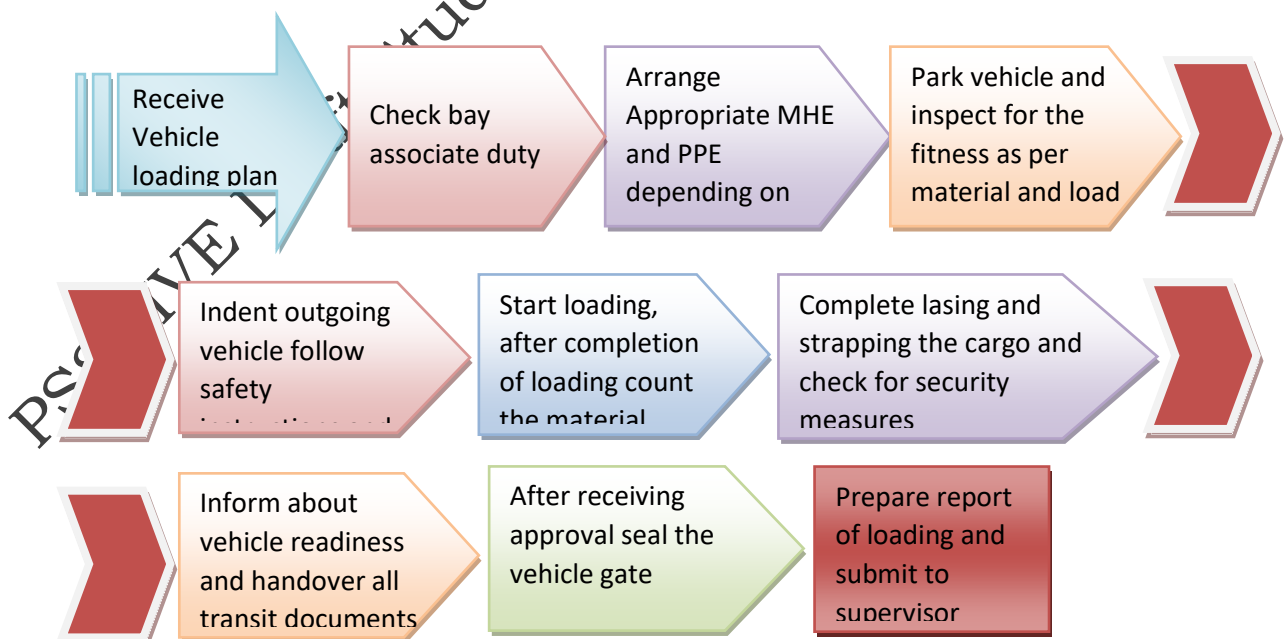
Fig. 3.19: **Loading Process**

Activities

Activity 1: Prepare a chart showing racking.

Material Required: Chart paper, Pictures of racks, glue, Scissor, Notebook, Pen/Pencil

Procedure:

1. Collect pictures of different racks used for automotive goods/material.

2. Paste these pictures on the chart paper

3. Write names of the racks with their use.

   a) Selective Pallet Racks
   b) Drive-In Racks
   c) Push-Back Racks
   d) Cantilever Racks
   e) Flow Racks
   f) Double-Deep Racks

   g) Mobile Racks

4. Explain the same in the class.

5. Ask students to prepare chart for class.

Activity 2: Identify PPE and MHE used for automotive goods.

Material Required: Note Book, Pen/Pencil, Checklist.

Procedure:

1. Visit an automotive service center.

2. Identify the PPE which are being used for handling automotive goods.

   a) Safety Helmets
   b) Protective Gloves
   c) Safety Glasses
   d) Steel-Toe Boots
   e) High-Visibility Vests

   f) Hearing Protection

3. Take a note of these PPE.

4. Prepare a note of your visit.

5. Discuss the same in the class.

Activity 3: Visit to automotive goods warehousing industry.

Material required: Check list, Notepad, pen /pencil.

Procedure:

1. Visit a warehouse specialised to stock automotive goods.

2. Observe all the functions and activities in the warehouse such as-

    Packing

    a) Packaging
    b) Palletization
    c) Raking, storing
    d) Loading
    e) Unloading
    f) Lashing
    g) Strapping and inventory management

3. Check these functions from the textbook and from what teacher has taught in the class.

4. Observe the daily reporting and damaged good handling.

5. Take a note of all those activities and role of employees.

6. Write a note on the visit and discuss in the class.

Check Your Progress

A. Fill in the Blanks

1. _____ is a specially designated place/commercial place where goods or material is stored.

2. The loads should not shift during _____.

3. _____ _____ _____ is concerned with the equipment used to move goods from one place to another and storage of goods.

4. After loading a material _____ and _____ of cargo is essential to securing load during transportation.

5. _____ pallet racking provides great flexibility for changes in dynamic operation.

6. Stacking arrangement should be _____.

7. _____ is used to storing of the material in the warehouse or distribution facility.

B. Multiple Choice Questions

1. SKU stands for

    a) Storage Keeping Unit
    b) Stock keeping Unit
    c) Strap Keeping Unit

d) None of the above

2. Selection of warehouse and containers/fixture/boxes/racks/pallets depend on the:

   a) Nature and type of material
   b) Goods to be stored
   c) Both A & B
   d) None of the above

3. MHE stands for

   a) Material Handling Equipment
   b) Massive Handling Equipment
   c) Mass Handling Equipment
   d) All of the above

4. The last control measure to be used in handling automotive goods is

   a) Warehouse
   b) Racking
   c) Personal Protective Equipment
   d) None of the above

5. Wire Decking is a type of

   a) Warehouse

   b) Racking

   c) Strap

   d) None of These

C. Match the Columns

Image	Name of the Equipment
1.	A. Hand Truck
2.	B. Narrow Aisle Straddle Truck

3.		C. Dock Leveler
4.		D. Counterbalanced Fork Lift Truck
5.		E. Pallet Positioners For Ergonomic Operations

D. Identify the symbols and write its suitable name

1.

2.
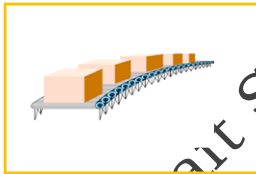
3.

4.

5.

E. Short Answer Questions

1. Meaning of loading and unloading.
2. What is storage?
3. General precautions to be taken while unloading.
4. Write the importance of PPE.
5. Precautions in strapping.

F. Long Answer Questions

1. Make a flow chart of unloading.
2. Elaborate the types of racking.
3. Explain briefly about Personal Protective Equipment.
4. Make a flow chart of loading.
5. Describe Material Handling Equipment.

G. Check Your Progress

1. Draw a flow process of loading and unloading.
2. Differentiate between lashing and strapping.
3. Spell out different types of racking and their uses.
4. Demonstrate the use of different PPE.
5. Identify different MHE and explain its uses.

Session 3: Inventory Management and Process Improvement Tools

Inventory consists of all sorts of goods and materials available in stock for producing finished good/product. Inventory management is the process of ordering, tracking and specifying the placement and size of the stocked goods to be managed at different locations or levels within or multiple different locations in a warehouse. There are various types of inventory.

Kanban, 5S, just in Time (JIT), Kaizen, Poka-yoke are used to manage Inventory by controlling, maintaining organising, sorting and maintaining quality standards. These tools are used in inventory management as process improvement tools.

INVENTORY MANAGEMENT

Inventory is defined as the goods and raw materials which are further used to produce finished goods. Inventory management is concerned with tracking, ordering, sorting and managing goods and raw material till the dispatch of final goods to the end user.

TYPES OF INVENTORY

There are many types of inventories in warehouses such as raw material and semi-finished goods. Third one is finished goods which are ready to be sold in the market and last is Maintenance, Repair and Operations (MRO) Goods or Overhaul, it is the inventory required for maintenance and repair of finished products. (Fig. 3.20)
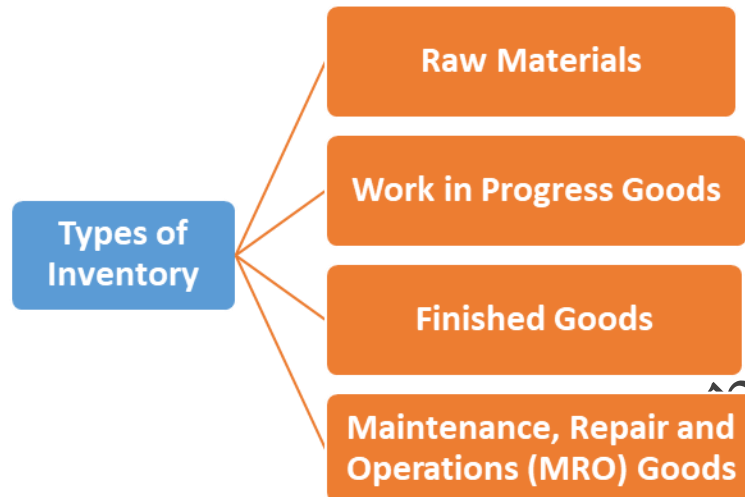
Fig. 3.20: Types of Inventory

BENEFITS OF INVENTORY MANAGEMENT

Inventory management has following benefits: -

1. The firm knows when to restock thus helps in maintaining adequate inventory for smooth production and selling activities.

2. It has to minimise the investment in inventory to enhance firm's profitability.

3. Inventory management helps in reducing total cost of inventory.

4. Inventory management avoids the stock-out problem.

PROCESS IMPROVEMENT TOOLS

Process improvement tools are tools/techniques or methods used to improve quality and performance of the organisation or work. With reference to automotive goods handling few of the improvement tools being used by logistic industry is discussed below.

KANBAN PROCESS

Concept Kanban

Kanban is a Japanese word where 'kan' means Sign and 'ban' means a board. Thus, it simply means to use visual sign displayed on the board which helps in prompting the action needed to keep smooth processing.

It is a process management tool in inventory management which tries to control the inventory in just in time manufacturing. In this system inventory is seen as a waste and only components which are needed are kept. Kanban system allows a

company to reduce inventory levels, which reduces the cost associated with stocking and storing materials in the organisation.

Kanban Process

Automotive goods organisation utilises the Kanban method in the warehouse or facility center to indicate a repurchase as well as on the production floor to signify inventory refilling/restocking. In a Kanban system, Kanban cards (Fig. 3.21) are a key component of Kanban systems as they signal the need to move materials when a worker finds low stock or an end of inventory. No material moves when the bins are full. This is also called Pull and Replenish system (Fig. 3.22).

Kanban Card					
Part Description				Part Number	
Battery 20V				237239	
Qty	50	Lead Time	1 week	Order Date	02-Dec-19
Supplier	50			Due Date	09-Dec-19
Planner	Ramamurthy		Location	Rack A-19-D	

Fig. 3.21: Kanban Card

PRIMARY BIN CONSUMPTION

ALERT IS TRIGGERED

SECONDARY BIN CONSUMPTION

REPLENISHMENT

Fig. 3.22: Kanban Replenishment

5S

5S process is about making the workplace more efficient, de-cluttered, and safer with hygiene and also enjoyable. This system focuses on reducing the waste and improving the productivity.

5S is derived from five Japanese words, which are (Fig. 3.23):

- Seri which means Organise.

- Seiton which means orderliness.

- Seiso which means cleanliness.

- Seiketsu which means standardize.

- Shitsuke which means discipline.

5S delivers immediate gains in productivity, morale and employee wellbeing.

Fig. 3.23: 5S

5S Process

5S works in a manner to remove whatever is not needed by sorting out needed material/item and instructions from unneeded materials then organise whatever is left by neatly arranging and identifying material/items for ease of use followed by cleaning up the work area by conducting a cleanup campaign. Finally, schedule the regular cleaning and maintenance by conducting *seiri*, *seiton*, and *seiso* daily. These all together build 5S a way of life, by being sustained and making the habit of always following the first four S's.

Just in Time (JIT)

Just In Time (JIT) is the strategic inventory system which manages inventory. Using this method of inventory controls in automotive goods handling organisation brings material into the production process, warehouse or to the customer just in time to be used, which reduces the need to store excessive levels of material in the warehouse. Therefore, organisation receives the goods/items/material as close as possible before they are actually needed.

For example; when a car manufacturer wants to assemble air bags in the car, the assembly plant does not stock those airbags in shelves, they rather receive them when the car comes to assembly line.

JIT Process

JIT process is a pull system that focuses on producing what is necessary, when it is necessary and in necessary amounts allowing to improve the quality and minimise the cost as well as delivery time. This process also reduces the waste and improves productivity (Fig. 3.24).
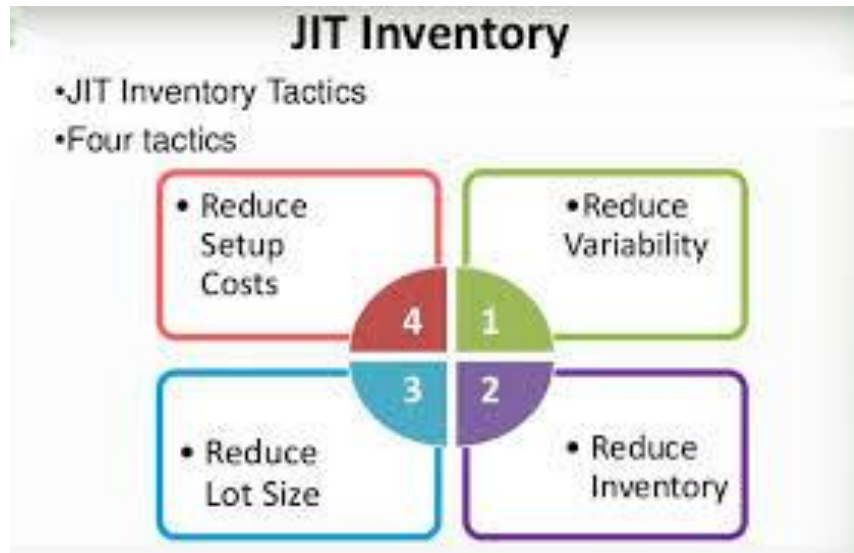
Fig. 3.24 1. JIT

KAIZEN

Kaizen comes from Japanese word, 'Kai' that means change, whereas 'Zen' means for the better, therefore, it means 'change for the better'. This also refers as improvement. Thus, it signifies constant and gradual improvement, no matter how small it is. Kaizen is a system of accumulated improvement.

Kaizen process

Kaizen process is developed on the idea that little and persistent positive changes can lead to worthy improvement. Thus it is a continuous improvement process and frequently regarded as "building blocks". This approach targets on eliminating waste and improving productivity.

Kaizen strategies are built on the belief that no process is ever perfect, but by constantly identifying and resolving problems, employees can bring a process closer and closer to perfection. The main purpose of Kaizen is to evolve total employee participation and it also helps in building capable work force for an organisation (Fig. 3.25).
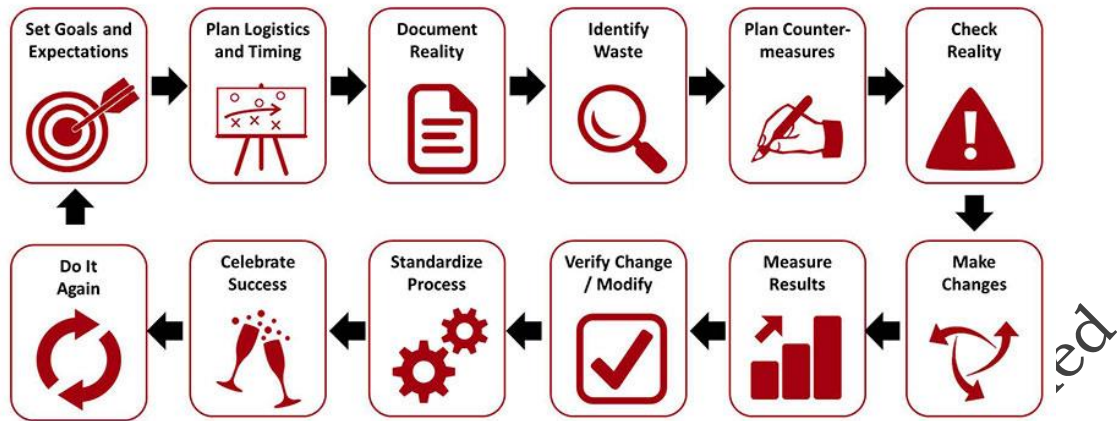
Fig. 3.25: Kaizen

POKA-YOKE

Poka-Yoke is a Japanese word which means mistake-proofing or unintended error prevention. Therefore, it is a technique to make the process error proof (Fig. 3.26).
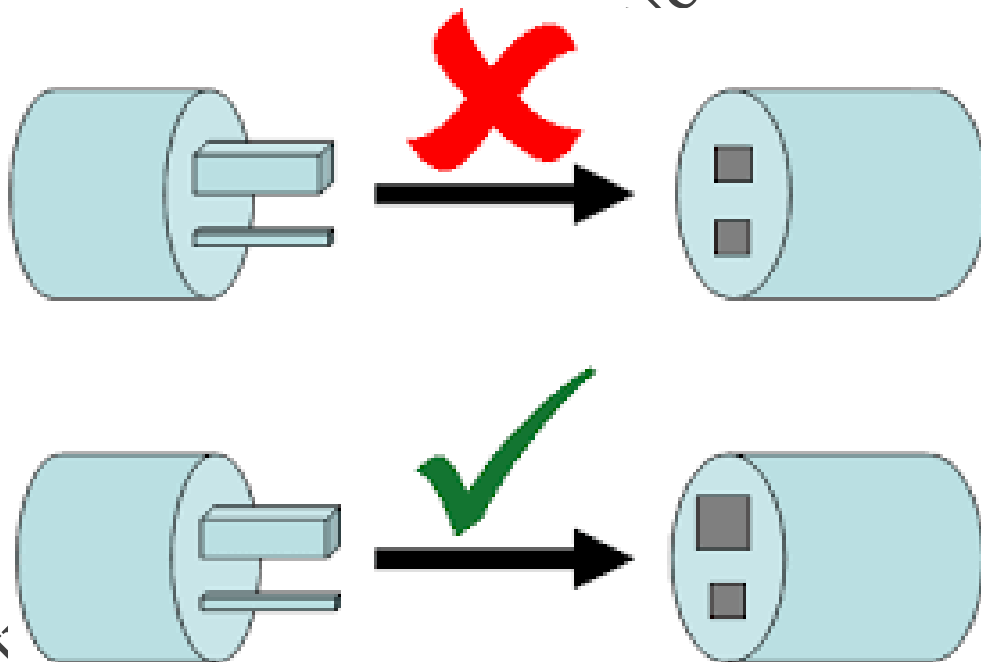
Fig. 3.26: Poke-Yoke

From the above example, the plug and socket are so designed such that it cannot enter into wrong holes. It will only enter where it is intended to do.

Poka-Yoke Process

It is a simple trigger that detects the occurrence of an error of when an error is about to occur. It notifies the process controller or stops the process from moving forward. Poka-yoke essentially makes a process error-proof. Following are the steps implementing Poka-Yoke (Fig. 3.27):

Step-1 • Identify the problem

Step-2 • Find the root cause

Step-3 • Determine the type of poka-yoke nedded to use

Step-4 • Determine most appropriate poka-yoke method to use

Step-5 • Test poka-yoke system to check if it works

Step-6 • Train employees

Step-7 • Review performance and measure success
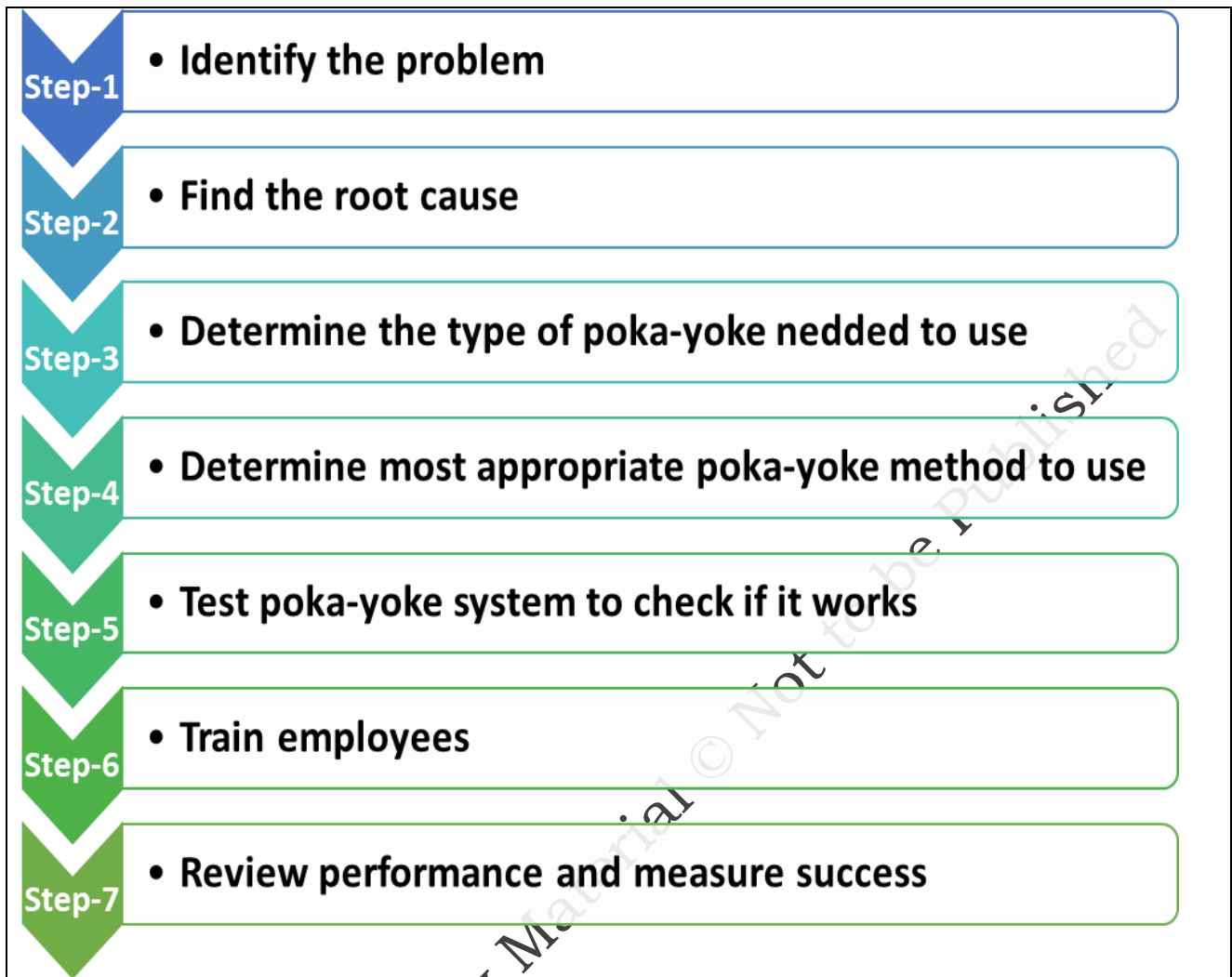
Fig. 3.27: POKA-Yoke Process

Activities

Activity 1: Prepare a chart for process improvement tools.

Material required: Drawing sheet, pen/pencil and sketch pen.

Procedure:

1. Read about process improvements tools.

2. Understand the difference and importance of process improvement tools.

   a) Increases Efficiency
   b) Reduces Waste
   c) Enhances Quality Control
   d) Promotes Continuous Improvement

   e) Improves Workflow Management

3. Draw a chart which contains Kanban, Kaizen, JIT, Poka-Yoke, and 5S.

4. Show that chart in class.

5. Ask students to explain and discuss in class.

Activity 2: Class Presentation: list the benefits of inventory management for Automotive Goods.

Material required: Notebook and pen/pencil.

Procedure:

1. Divide the class into groups.

2. Ask students to give group wise presentation in class on the following topic

   a) Explain inventory in the class room.

   b) Explain the automotive goods.

   c) Explain the benefits of inventory management.

3. After this student should submit their presentation to their teacher.

4. Teacher should evaluate and give marks.

Activity 3: Role Play in lab setting: Sort and place material for item on racks, shelves or in bins according to Kanban list.

Material required: Chart Paper, Notebook, and color pen/pencil.

Procedure:

1. Prepare bins as per automotive goods available in LAB setting.
2. Make visual display of all bins with color coding (color cards).
3. Sort material and perform a role of warehouse associate to show Kanban process of sorting and placing inventory.
   a) Visualize Workflow
   b) Identify and Label Kanban Bins/Slots
   c) Sort Incoming Materials
   d) Place Materials in Designated Kanban Slots
   e) Track Inventory Levels
   f) Signal Replenishment When Slots Are Empty
4. Ask students to perform Role-Play.
5. Teacher should give remarks on the basis of the performance.

Check Your Progress

A. Fill in the Blanks

1. _____is concerned with tracking, ordering sorting and managing goods and raw material till the dispatch of final goods to the end

user.

2. Inventory management helps in reducing _____ of inventory.

3. _____ are the key components of Kanban systems.

4. _____ process is a pull system.

5. Poka-Yoke is a Japanese word which means _____.

B. Multiple Choice Questions

1. What is the primary focus of the Kanban process in inventory management?

   a) Maximizing inventory levels

   b) Reducing waste and improving productivity

   c) Increasing storage space

   d) Standardizing inventory procedures

2. What does the 5S process aim to achieve in the workplace?

   a) Maximizing clutter

   b) Minimizing productivity

   c) Making the workplace efficient, organized, and safer

   d) Encouraging more waste

3. What is the key principle of the Just In Time (JIT) inventory system?

   a) Stockpiling excessive levels of material

   b) Receiving goods just after they are needed

   c) Storing materials for long durations

   d) Delaying production processes

4. What does Kaizen focus on in the context of process improvement?

   a) Static processes

   b) Frequent and gradual improvement

   c) Immediate and radical changes

   d) One-time improvements

5. What is the purpose of Poka-Yoke in the manufacturing process?

   a) Increasing the chances of errors

   b) Allowing unintended mistakes

   c) Making the process error-proof

   d) Ignoring errors during production

C. State whether the following statements are true or false

1. 5S essentially makes a process error-proof.

2. Kanban is regarded as "building blocks".

3. JIT reduces the need to store excessive levels of material in the warehouse.

4. Kaizen is also called Pull and Replenish system.

5. Maintenance, Repair and Operations (MRO) Goods or Overhaul is the inventory required for maintenance and repair of finished products.

D. Match the Columns

1	5S	A	Prompt action for smooth process
2	Kanban	B	Reduce excessive stock levels
3	JIT	C	Accumulated improvement
4	POKA-Yoke	D	clean and hygienic
5	Kaizen	E	Error proof process

E. Short Answer Questions

1. Discuss the types of inventory management.
2. Discuss the process improvement tools.
3. Write the benefits of inventory management.

F. Long Answer Questions

1. Explain JIT in detail.
2. Elaborate Poka –Yoke process.
3. What do you mean by inventory management? Explain its benefits.

G. Check Your Performance

1. Demonstrate the Kanban process.
2. Spell out the 5S process.

Session 4: Inventory Count, Dangerous Product Handling and Daily Reporting

Inventory counting is a significant component of inventory management. Effective and efficient inventory counting is important to an organisation's profit/loss. The physical counting of the quantities and condition of items held in the store area and damage/defective or wrong products must be identified and reported to the senior level. It is important for a warehouse associate to know about handling

special/dangerous material/goods in the warehouse.

MEANING OF INVENTORY COUNTING

Inventory count is also known as Stock-taking. It is physical counting of stock of goods on hand, material, finished goods, etc. Inventory count is the basic requirement for organisation's economic control.

In other words, inventory count is a list of quantities of stock of automotive goods/material on hand at definite point of time. It means to identify each physical goods to quantify it and record the count manually/automatically.

INVENTORY COUNT PROCESS

One of the vital activities in warehouse management is inventory counting. The physical inventory lying at the warehouse should always match the inventory as per the stock ledger. Any deviations could mean loss of inventory or loss of value (Fig. 3.28).

Almost all warehouses spend a lot of time and efforts on keeping their inventory accurate. As they say "To control you have to first measure". There are 3 techniques of inventory count process which are applicable for automotive goods as well:

Physical inventory: This is a practice of counting the complete inventory wall to wall at-once in one go. Most of the companies must do it once a year, during the year end as it is a regulatory re-equipment also.

Spot checking: Spot checking means choosing a product or set of products and conducting the physical count of the material at that moment and tallying with the system count. This is an unscheduled checking of inventory.

Cycle counting: Here, instead of doing the whole physical count during year end, the warehouse counts its inventory every day, throughout the year. Each day certain set of SKU are identified and counted. They are tallied and in case of any variances, corrections are done immediately.

To physically count goods/material in the warehouse the following sheet is used.

INVENTORY COUNT SHEET										
Date										
Name of facility										
				Physical Stock						
Sl No.	Product Code	Product Description	Unit of Mesaurement	Unrestricted	Blocked	Hold	Total Physical Stock	Stock Balance as per System	Excess / Shortage	Remarks if Any
				A	B	C	D=A + B + C	E	D-E	
Name & Signature of Associate		Signature Of Verifyng Officer					Signature of WH Manager			

Fig. 3.28: Inventory Count Sheet

Inventory Count Procedural Steps

The procedural steps in inventory count are as follows (Fig. 3.29):

- Assist the inventory assistant
- Freeze the warehouse activities
- Distribute the counting responsibility to assistant
- Assign sequencing of stock to assistant
- Write information on tag
- Verify tags
- Summarizing report

Fig. 3.29: Inventory Count Procedural Steps

DAMAGED GOODS

Damaged goods are products that are broken, cracked, scratched, etc. These are the goods which do not meet the product specifications. The damage occurring during loading or unloading of goods/material is because of mishandling and cause loss to warehouse or organisation.

DEFECTIVE PRODUCT

A product defect is any feature that prevents it from being used for the intended purpose for which it was created. In other words, a defective product is one that harms a person due to, either its design or manufacturing defect, or insufficient instructions or warning.

WRONG PRODUCT

A product that is different from the specifications given is known as wrong product. In other words, when a product received is different from the description ordered falls in wrong product category.

REPORTING OF DAMAGED PRODUCT

Warehouse is an action-packed place. Goods continuously come in, get stored and move out. Despite all precautions there are still some chances of damage or breakage during warehouse operations (put away, picking, packing, returns etc.) (Fig. 3.30).

In case of any such incident, the associate is supposed to report immediately to the warehouse supervisor and fill the damage report on immediate basis. The important aspect in filling up this report is to describe the event happened and preventive measures taken for future. Following is an example of a damage report:

Fig. 3.30: Loss and Damage Report Specimen

This report generally contains information about the damaged/defective/wrong goods. It contains information such as (Fig. 3.31):

- Nature of goods
- Consignment number
- Shipment tracking number
- Description of the condition of goods
- Evidence of damage (whatever available)
- Recoverable quantity /Salvage goods
- Replacement goods quantity
- Description of replaced goods
- Details regarding the fitness of replaced good
- Location of damaged goods
- Detailed description of disposal process if needed
- Preventive future action if needed

Fig. 3.31: Information related to damaged goods

After completion of the report these goods need to be further cleaned up and space should be made available for next consignments.

IMPORTANCE OF CLEANING

It means ensuring a safe work environment for the people working. In case of warehouse good cleaning helps:

- In keeping the floor free from slip or trip hazards.
- In preventing any fire hazards.
- To prevent any hazards around conveyors or charging stations.
- In removing any obstructions in the path for forklifts.
- To ensure level surface for movement of HPT and BOPT.

cleaning is an ongoing daily exercise for warehouse not a onetime effort.

AISLES

Keeping aisles clean is important to function effectively in the warehouse. Aisles should be wide enough to safely and easily accommodate the MHE and the people operating there. Aisle should allow movement of material, machines and manpower.

Any excess material should not be kept in aisles and block them, thus keeping aisles functional and free.

To effectively illuminate the warehouse for easy working, the lighting should be installed on top of the aisles. At the blind corners, aisles should have mirrors and suitable warning signs (Fig. 3.32).

Fig. 3.32: AISLES

HANDLING DANGEROUS PRODUCTS

Dangerous and special goods/materials require special handling and attention whenever they are stored in warehouse. A specific Standard Operating Procedure (SOP) is set for each type of such goods/materials. It is required to strictly follow organisation's SOP for safety of people and warehouse (Fig. 3.33).

To keep dangerous goods/materials in the warehouse, following points should be taken care of:

- All articles or substances considered as dangerous goods must be identified.

- These goods/materials should be classified,

- Hazardous materials are generally assigned to one or more of the following classifications (Fig. 3.34).

Fig. 3.33: Signs to Handle Dangerous Products

- These should be assigned to one of the standard names used in the transport and storage of dangerous goods.

- Warehouse must identify the material which cannot be stored together and create separate designated places for them.

- Material Safety Data Sheets (MSDS) and container labels will be the basis of reference to conduct the evaluation.

Hazardous Material Check List		
1	Product Name	
2	Hazard Class	
3	PPE required to handle	
4	Engineering Controls/ Ventilation	
5	Special Handling Procedures	
6	Storage Requirements	
7	Special Containment	
8	Accident Procedures	
9	Waste Disposal	
10	Special Precautions	
11	Decontamination	
12	Designated Areas	
13	Approved by	

Fig. 3.34: Hazardous Material Checklist

Safety precautions while handling automobile goods

- Utilize accumulation conveyors that hold products in place until signaled to release it.

- Load & wrap pallets right.

- Watch weight: do not overload shelving or racks.

- Install safety equipment.

DAILY REPORTING

After completing all the activities for the day, the warehouse associate must update status of the entire activities to his/her reporting manager and make notes of the pending tasks in each activity to plan for the next day work.

The manager will conduct a sundown (closing) meeting with the associates and explain work to be done for the next day. He/she may perform safety inspections in all areas in the warehouse and check on the condition of every equipment and personal protective equipment.

Report to management for any shortage shipments, customer claims, cycle count discrepancies, breakages, damages, accidents, near misses happened during the day. Notify manager regarding any concerns faced during the day for appropriate actions. Complete the daily activity forms as required by management.

Below are the reports which can be maintained on daily activities (Fig. 3.35):

DAILY WORK REPORT							
NAME OF WAREHOUSE:							
NAME OF ASSOCIATE:				DATE:			
S.NO	DATE	NAME OF TASK	COMPLETED		PENDING		SIGNATURE

Fig. 3.35: Workers daily Activity Sheet

Activities

Activity 1: Need for study of types of inventory counting.

Material required: Drawing sheet, pen/pencil and sketch pen.

Procedure:

    1. Firstly read about inventory and then inventory counting.

2. Observe what are types of inventory available in introduction of unit.

3. Draw a chart which contains various types of inventory (try to mention examples).

    a) Raw Materials
    b) Work-in-Progress (WIP)
    c) Finished Goods
    d) Maintenance, Repair, and Operations (MRO) Supplies
    e) Packaging Materials
    f) Safety Stock

4. Show that chart in class.

5. Ask students to explain that chart.

Activity 2: Role play: assisting in Inventory cycle counting.

Material required: Check list, Notebook, and pen/pencil.

Procedure:

1. Divide the class into groups.

2. Read the process of inventory counting in detail.

3. Explain the types of inventory counting.

    a) Periodic Inventory Counting
    b) Perpetual Inventory Counting
    c) Cycle Counting
    d) ABC Counting

    e) Two-Bin Counting

4. In a lab setting play a role of warehouse associate.

5. As per SOP of organization perform cycle counting.

Activity 3: Prepare a Chart of Daily Report and Damaged Goods Report.

Material required: Chart Paper, Notebook, and pen/pencil.

Procedure:

1. Divide the class into groups

2. Prepare a Damaged goods report format for automotive goods on a chart.

    a) Date and Time of Report
    b) Reporter's Name and Contact Information
    c) Description of Damaged Goods
    d) SKU/Part Number
    e) Quantity of Damaged Items

    f) Nature of Damage

3. Prepare daily report chart on chart paper.

4. With the help of prepared chart explain important elements of both reports.

Check Your Progress

A. Fill in the Blanks

1. Inventory counting is a significant component of _____.
2. Inventory count is also known as _____.
3. _____are the goods which does not meet the product specifications.
4. _____is an action-packed place.
5. _____ensuring a safe work environment for the people working.

B. Multiple Choice Question

1. What is another term for inventory counting in warehouse management?

    a) Stock-selling

    b) Stock-checking

    c) Stock-taking

    d) Stock-monitoring

2. What is the primary purpose of conducting spot checking in the inventory count process?

    a) To count the complete inventory at once

    b) To schedule daily counts throughout the year

    c) To choose specific products for unscheduled checking

    d) To identify damaged goods in the warehouse

3. What does the term "Spot checking" involve in the context of inventory management?

    a) Counting the entire inventory wall to wall

    b) Randomly choosing products for physical count

    c) Conducting daily counts throughout the year

    d) Tallying with the system count immediately

4. What is the purpose of the Loss and Damage Report in a warehouse?

    a) To record daily activities

    b) To maintain cleanliness in the warehouse

    c) To report damaged, defective, or wrong goods

    d) To handle dangerous products safely

5. Why is cleaning important in a warehouse, especially in aisles?

    a) To prevent accidents and maintain a safe work environment

    b) To reduce the need for inventory counting

    c) To speed up the movement of forklifts

    d) To store excess material in aisles

C. State Whether the Following Statements are True or False

1. Material Safety Data Sheets (MSDS) and container labels are the basis of reference to conduct the evaluation.

2. In the stock area/warehouse different types of material, finished goods are kept in safe area and the stock should be carefully handled to avoid breakage.

3. The inventory counting is part of logistic and supply chain management.

4. counting the complete inventory wall to wall at once in one go known as cycle count.

5. Aisles should be wide enough to safely and easily accommodate the MHE and the people operating there.

D. Write the name of the class for each class shown below in picture

E. Short Answer Questions

1. Discuss the concept of inventory counting.

2. What are the damaged, defective and wrong products?

3. Explain the importance of cleaning.

F. Long Answer Questions

1. Discuss handling of dangerous products.

2. Explain in detail about daily reporting.

G. Check your Performance

1. Demonstrate the inventory count process.

2. Spell out the hazardous products and its checklist.

MODULE **4**	**INTEGRITY AND ETHICS**

Module Overview

Every business must follow integrity and ethics. Ethics are standards, imposing restrictions and are ways to avoid social evils. To have different result for different people the combination of ethic and experience is used. The guidelines laid down by companies to protect them from immoral activities. The quality of being honest, having strong moral principles and moral uprightness.

Our inner world drives our outward action. It is an internal quality and depends on person to person. Therefore, it is mandatory to be honest by own self. This is a perquisite to integrity. A person with strong commitment will not change and abide all ethics and integrity.

Integrity is a choice and it's a commitment that you make to be honest, trustworthy, and base your life and decisions on good morals. Integrity often means doing right thing even if it means putting your own benefits at risk.

Important concepts such as integrity and ethics are discussed in this chapter. How to stop corrupt practices from happening within the warehouse is clearly explained in this chapter. There are a set of code of conduct and etiquettes which needs to be followed and practiced by all the employees. Any violations of ethics and code of conduct should be properly dealt with and escalated to the seniors as per the matrix set by the organisation.

The unit is divided into four sessions. The first session comprises of company's policies and regulatory requirements. The second session includes data information, security and corrupt practices. The third session discusses business ethics and code of conduct. Last session comprises of document integrity and ethics violation.

Learning Outcomes
After completing this module, you will be able to: • Understand company policies and regulatory requirements. • Learn best practices for maintaining data integrity and security. • Master business etiquette and adherence to the code of conduct. • Understand the importance of document integrity and procedures for addressing ethics violations.
Module Structure
Session 1: Company's Policies and Regulatory Requirements
Session 2: Data Integrity and Security Practices
Session 3: Business Etiquettes and Code of Conduct
Session 4: Document Integrity and Ethics Violation

Session 1: Company's Policies and Regulatory Requirements

Integrity is a core value in a human being which every company looks for in an employee. Integrity is core to conducting warehousing operations too. The key elements of integrity are honor, trust and honesty (Fig. 4.1). At the warehouse, integrity is the key pillars for ethical conduct and accountability. It is basic and most essential. No company wants to deal with an employee who cheats or deceits its vendors or customers, steals from the warehouse and is insincere and untruthful. Operations built on integrity are lasting, sustainable and profit making.

According to **C S Lewis.** -

"Integrity is doing the right things even when no one is watching"

Fig. 4.1: Integrity

Ethics

The word ethics is derived from Greek word "ethos", which means "way of living". Ethics are the standard or behavior that helps in deciding what is right and what is wrong (Fig. 4.2).

Fig. 4.2: Ethics

Work Ethics

Being ethical at the workplace means doing right things all the time. It means demonstrating the qualities of honesty and trust in all actions, decisions and communications (Fig. 4.3).

Punctuality	It is all about treating time as value. Being on-time at all-times.
Accountability	Shouldering the responsibility and not playing the blame game.
Focus	Being completely attentive to the task in hand not getting distracted.
Initiative	Doing something positive without being asked.
Productivity	Delivering more and more in less and less of time.
Professionalism	Working diligently, showing respect to others and presenting oneself well for the work.
Dedication	Dedication means consistency and showing up for the job everyday with a great level of focus and productivity.
Desire to Improve	A continuous urge to learn and perform more and grow.
Humility	Acknowledging the contribution of others and sharing the credits.

Fig. 4.3: Dimensions of strong work Ethics

Workplace ethics are the standards to be followed while conducting a job. Workplace ethics plays a big role in the profitability of a company. It is critical to the success of any organisation. Lot of organisations have formal document workplace ethics guidelines. This ensures that all the individuals believe in and display the same level of ethical behavior in workplace.

Company's policies on - Use of language

Language is the system of communication consisting of words, sounds, grammar, etc. If we are able to know a language, we are able to understand the culture. Language and culture are inseparable and helps to face customers with right approach and helps in the success of any international work.

According to Kaplan and Baldauf -

"A language policy is a body of ideas, laws, regulations, rules and practices intended to achieve the planned language change in the societies, group or system"

Basic guidelines for developing your company language policy-

1. Make policy responsive.
2. Formalise company language policy.
3. Identify language assets.
4. Update policy as needed.

Company's policies on - Human Resources Policies

Human resources policies provides guidelines for hiring, work processes, work environments, promotion compensation, training, termination and other functions (Fig. 4.4). It outlines how organisation will treat people and property. They're developed by HR managers with the help of company management. It's important to enumerate the policies before issues arise so you know how to respond.

Fig. 4.4: Human Resource Policy

HR Policies for Employees

1. **Recruiting/Hiring Policies**: Guidelines outlining how to attract, evaluate, and hire new employees fairly and efficiently.

2. **At-Will Employment**: Employment relationship that can be terminated by either the employer or employee at any time without cause.

3. **Reasonable Accommodation**: Adjustments or modifications provided by an employer to enable people with disabilities to perform their job.

4. **Disciplinary Termination Policies**: Procedures for terminating employees based on violations of company policies or poor performance.

5. **Meals and Break Periods**: Regulations regarding the scheduling and duration of meal and rest breaks for employees.

6. **Using Company Property**: Rules governing the use of company equipment, vehicles, and other resources by employees.

7. **Employment Classification**: Categories defining the status of employees (e.g., full-time, part-time, temporary).

8. **Non-Discrimination and Anti-Harassment**: Policies ensuring a workplace free from discrimination and harassment based on race, gender, age, etc.

9. **Resignation or Exit Policies**: Procedures employees must follow when voluntarily leaving the company.

10. **Compensation Policies**: Guidelines on how employees are paid, including salary, bonuses, and raises.

11. **Workplace Attire Policies**: Dress code requirements for employees, detailing acceptable and unacceptable attire.

12. **Attendance Policies**: Rules regarding punctuality and attendance, including reporting absences.

13. **Referral Program Policies**: Incentives and procedures for employees who refer qualified candidates to the company.

14. **Expense Policies**: Guidelines for reimbursing employees for business-related expenses.

15. **Leave Policies**: Regulations regarding various types of leave, such as vacation, sick leave, and parental leave.

16. **Bereavement Policies**: Guidelines for leave granted to employees after the death of a family member.

17. **Local and State Laws**: Compliance with employment laws and regulations specific to local and state jurisdictions.

Trending HR Policies-

Following are the trending HR policies in employee handbook (refer Fig. 4.4)

1. Social media policy.

2. Remote work policy.

3. Weapons in the workplace policy (zero tolerance of violence at workplace).

4. Updated confidentiality policy.

5. Drug and alcohol policy.

6. Bring your own device (BYOD) policy.

Company's Policies on - Code of Ethics

The goal of employee conduct policies is to keep the workplace environment safe and comfortable for all. These include sexual harassment, anti-discrimination policies and alcohol. As part of their employment agreement, company workers are required to abide by Employee Code of Ethics (Fig. 4.5). Below is the list of elements of our code of Ethics:

a) Compliance with law

b) Respect in the workplace

c) Protection of Company Property

d) Professionalism

e) **Personal appearance**

f) **Corruption**

g) **Job duties and authority**

h) **Absenteeism and tardiness**

i) **Conflict of interest**

j) **Collaboration**

k) **Communication**

l) **Benefits**

m) <u>Policies</u>

Fig. 4.5 Code of Ethics

Employees who regularly or willfully violate code of conduct may be subject to disciplinary action by company. Depending on the offence, different disciplinary measures must be taken. It may include-

a) Demotion.

b) Reprimand.

c) Termination or Suspension for serious offense

Company's policies on - Whistle blower policy

When an employee alerts the public to fraud, corruption, or misconduct within a company, this is referred to as whistleblowing. A former employee who discloses information about what is allegedly fraud, corruption, or a violation of the company's policies and the law is known as a whistleblower in India.

Company's rules related to sexual harassment

Sexual Harassment is essential for the companies to take seriously. Maintain the current policies and making explicit, zero-tolerance policies regarding any improper or unwelcome sexual behaviors or comments (Fig. 4.6).

1. Physical conduct like physical violence, physical contact, or unwanted physical contact such as pinching, caressing, kissing, embracing, or inappropriate touching. using pressure or benefits from the workplace to ask for sexual favors.

Fig. 4.6: Sexual harassment

2. Verbal conduct like remarks on a worker's age, appearance, personal life, sexual comments, jokes, and advances are also prohibited. Insults based on a worker's sex and condescending or paternalistic statements are also prohibited, sending texts with graphic sexual content (by phone / email).

3. Non-verbal conduct like whistling, leering, or the display of pornographic or provocative content are all examples of sexually inappropriate behavior.

4. It is the duty of employer to take preventive steps after learning about any harassment. Strict disciplinary action must be taken by the company.

Regulatory Requirements

Every business must comply with the laws laid by the central and state government. All good organisations ensure that they are hundred percent compliant with the laws of the land. Any non-compliance invites large penalties and huge loss of reputation.

With regards to the role of a warehouse associate, following are the key laws that the warehouse should comply with (Fig. 4.7):
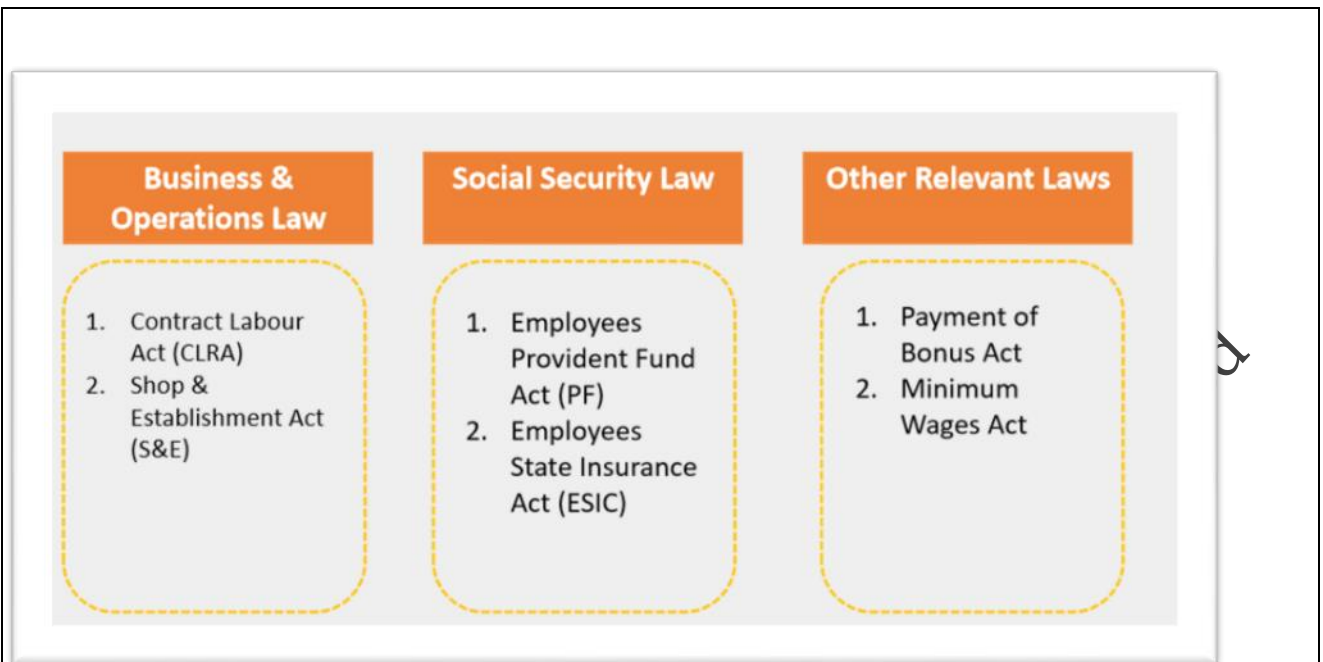
Fig. 4.7: Regulatory Compliance

A. **Contract Labour (Regulation & Abolition) Act**

Applicability of act: To every establishment and contractor employing twenty or more workmen as contract labour.

Primary role:

Principal employer - (*obtain registration* employing contract labour)

Contractor - (*obtain license* executing any work through contract labour)

B. **Shops and Establishment Act**

Applicability: Every shop or commercial establishment which is not connected with the manufacturing process of a factory, the provisions of the act will apply to it.

C. **Employees Provident Fund Act:**

Applicability: Every establishment that employs 20 or more persons.

Membership: Get employers code number under the PF Act.

Eligibility:

Person who is employed through contractor or employed directly. Employees' contribution up to a Salary (Basic + DA) less than or equal to Rs.15000/- is required to become a member. An employee is eligible for membership of fund from the very first date of joining the establishment.

Rate of contribution:

Employees' share: 12% of (Basic + DA)

Employer's contribution: 13% of (Basic + DA)

D. Employees State Insurance Act

Applicability: Shops and establishments employing 20 or more people.

If the above conditions are fulfilled the employer's primary role is to get employers code number under ESIC ACT (Fig. 4.8).

Registration of the employees to be done within 10 days from the day the act becomes applicable.

Fig. 4.8: Insurance

Eligibility: Any person employed (directly or indirectly) for wages (up to Rs. 21,000) a month, excluding overtime work or in connection with the work of the establishment.

Contribution ESIC   (4.0 %)

Employers Share   (3.25 %)

Employees Share   (0.75 %)

E. Payment of Bonus Act

Bonus represents a payment (profit sharing) made in additions to wages.

Applicability: Every establishment employing 20 or more people.

The government can, apply the act by employing not less than 10 persons.

Eligibility: Employee drawing salary up to Rs. 21000/P.M and worked for a minimum period of 30 days in a year.

Employees, whose salary exceeds Rs. 21000/-, are not entitled to get bonus as per the act.

For the calculation of bonus (Basic + DA) has to be taken as Rs.7000

Minimum bonus: 8.33 % of salary or wage

Maximum bonus: 20 % of salary or wage

Bonus must be paid within a period of 8 months from the closure of accounting year.

F. **Minimum Wages Act:**

Applicability: The Minimum Wages act applies to all employees whether they are casual, daily rated, temporary or on a permanent basis (Fig. 4.9).

The minimum wage is fixed by state government and the amounts vary from state to state from region to region and gets revised from time to time.

Records should be maintained:

Form I - Abstract of Minimum Wages Act.

Form II - Muster roll and wage register.

Fig. 4.9: Law related to Wages

Role of a Contractor:

In case, the warehouse associate has been employed through a contractor and not directly by the company, following are the key actions to be taken by the contractor:

1. Obtain contract labor license whenever applicable.

2. Maintain documents and registers and submit a copy to principal employer

every month.

3. Payment of wages as per the Minimum Wages Act.

4. Working hours - not more than 48 hours per week or 9 hours per day.

5. Supervise and reports all routine work.

6. Attend to all inspections.

7. Abide by all labour laws including payment of wages properly on time.

Payment of statutory dues like PF / ESI / bonus on time.

Checklist for Compliance:

Compliance to all statutory laws is mandatory for all warehouses. The manager must follow a sample check list on monthly basis to ensure that the warehouse is fully complaint (table 4.3).

Act	Compliance
S&E Act	To obtain registration certificate under S&E
	Check renewal of registration
	To take renewed S&E certificate
	Maintenance of attendance register
	Display of S&E registration certificate
	Display of DIESL holiday list for the respective state
Contract Labour Act	Check registration taken (if applicable)
	Take RC under CLRA Act
	Check renewal/ amendment of contract labour
	To take renewed CLRA Certificate
	Check yearly return submitted
	To file yearly return under CLRA
	Obtaining license from contractor
	Attendance register maintained
	Maintenance of wages register

	Check half yearly return submitted by contractor
	Check identity cards issued to associates engaged by contractor
PF Act	Acknowledge copy of PF challan submitted
	Check monthly return as generated by PF online system submission.
ESIC Act	Acknowledge copy of ESIC challan of the previous month submitted
	Check ESIC (temporary or permanent) cards generated by ESIC online system issued to associates
Min Wages Act	Check whether minimum wages are paid
Bonus Act	Submission of yearly register in Form C
	Submission of annual return in Form D

Table 4.3: Sample Checklist for regulatory compliance

Activities

Activity 1: Visit a warehouse and observe.

Material Required: Note Book, Pen/Pencil, Check list.

Procedure:

1. Visit a warehouse along with peers.

2. Meet the inventory executives and others and greet them.

3. Take a tour of the warehouse and enquire from the manager about

   a) how to avoid using company's funds

   b) property or resources for undertaking personal activities.

5. Show your notes to the executive and confirm.

6. Prepare a report and discuss with friends and show it to the teacher.

7. Discuss your report in the class.

Activity 2: Visit a warehouse to understand the difference in public and private sector functionality.

Material Required: Note Book, Pen/Pencil , Checklist.

Procedure:

1. Visit a warehouse along with peers.

2. Meet the Warehouse associate and other employees in the warehouse.

3. Take a tour and enquire to Warehouse associate about the following:

   a) To protect customer's information and ensure it is not misused.
   b) To follow the rules strictly on sexual harassment.
   c) To identify various regulatory requirements to logistic industry.

4. After this student should prepare report.

5. Student should submit their report to their teacher.

Check Your Progress

A. Fill in the Blanks

1. _____is core value in a human being which every company looks for in an employee.

2. _____are the standard or behavior that helps in deciding what is right and what is wrong.

3. Depending on the offence, different disciplinary measures must be taken. It may include-_____,Reprimand, <u>Termination</u> or Suspension for serious offense.

4. The _____ has been employed through a contractor and not directly by the company.

5. _____represents a payment (profit sharing) made in additions to wages.

B. Multiple Choice Questions

1. What is the primary role of integrity in warehousing operations according to the text?
   a) Maximizing profits
   b) Sustainable and lasting operations
   c) Employee discipline
   d) Regulatory compliance

2. How is the term "ethics" defined in the context of the text?
   a) Workplace behavior
   b) Decision-making
   c) Way of living

d) Trust and honesty

3. Which HR policy is mentioned as a trending policy in the text?
   a) Attendance Policies
   b) Compensation Policies
   c) Social media policy
   d) Non-Discrimination and Anti-Harassment

4. What is the primary goal of a Whistleblower Policy in a company?
   a) Encouraging unethical behavior
   b) Protecting employees from discipline
   c) Reporting fraud or misconduct
   d) Enhancing workplace safety

5. Under the Minimum Wages Act, what records should be maintained by companies?
   a) Form I - Abstract of Minimum Wages Act
   b) Form II - Muster roll and wage register
   c) Both a and b
   d) None of the above

C. State whether the following statements are True or False

1. The word ethics is derived from the Greek word "ethos".

2. "Integrity is doing the right things even when no one is watching". This is statement is given C S Lewis.

3. In Contract Labour (Regulation & Abolition) Act-Principal employer - (*obtain registration* employing contract labour).

4. PF Act do not include checking monthly return as generated by PF online system submission.

5. A former employee who discloses information about what is allegedly fraud, corruption, or a violation of the company's policies and the law is known as a whistleblower in India.

D. Short Answer Questions

1. State the concept of (a) Integrity (b)Ethics (c)Work Ethics.
2. Elaborate company's policies on the use of language.
3. "Warehouse associate has been employed through a contractor". Explain.
4. Explain Company's policies on Whistle blower policy.
5. Illustrate Company's rules related to sexual harassment.

E. Long Answer Questions

1. Discuss the importance of integrity.
2. Describe the steps in fostering integrity at the workplace.
3. Explain work ethics and the key dimensions associated with it.
4. List the various acts and laws that govern the logistics industry.

5.Describe how to comply with the regulations.

F. Check Your Performance

1.Draw a chart showing Compliance to all statutory laws.
2.Draw a chart showing dimensions of strong work Ethics.
3.Draw a chart showing Sample Checklist for regulatory compliance.

Session 2: Data Integrity and Security Practices

Warehouse is the repository of several important data and information. All inward movement, outward movement and stock information are recorded in the warehouse. Warehouse carries information about the pricing of the products, the discount structure, the sales numbers, stock data and several other vital information. All these information needs to be protected and should be in the right hands only.

Protected information in any form, e.g. electronic or physical.

1. Tangible – in the form of paperwork and records of various transactions which happen at the warehouse.

2. Intangible – various data in electronic form stored inside the computers and servers.

Information Security: Information security (Fig. 4.10) is practice of protecting information. It involves preventing inappropriate access to data, or unlawful use, disclosure, modification, disruption, deletion, corruption, inspection, recording of information. It involves actions intended to reduce the adverse impacts of incidents.

Fig. 4.10: Information Security

Information security is the balanced protection of confidentiality, integrity and

data availability while maintaining focus on effective policy enactment, all without hampering organisation's productivity. This can be achieved through structured information risk management process.

Following are some of the steps which can be used to protect the integrity of information:

Lock down hardware

The computer systems should be switched off at the end of the day, holidays and while not in use.

Turn off private browsing

The warehouse team should have access to limited sites which are required only for delivering the duties. All private browsing sites should be turned off.

Practice good password management

Passwords should have limited access. They should be available only with the relevant people in the warehouse. They should be strong and unique and difficult to remember. They should ideally be a combination, characters, numbers and special characters. Further, they should be amended periodically.

Use two-factor authentication

In case of very discrete information, companies may implement the policy of two level of authentication for the access (Fig. 4.11).

Fig. 4.11: Two factor Authentication

Keep software up to date

Install the latest updates of the software that you use. The newer updates carry better features in terms of security and data protection.

Avoid Phishing - beware of suspicious emails

Do not open any email or data from unreliable sources. Be constantly suspicious

and avoid any phishing related risks.

Do not download Software

No software should be downloaded by the employee in the warehouse unless approved by the company IT team. Avoid visiting unknown websites or downloading software from untrusted sources.

Install anti-virus protection

A strong anti-virus software is a must. Most of the times companies follow company wise anti-virus software and protection systems.

No External Memory devices

No external memory devices like hard disks, pen drives should be allowed in the warehouse. Ideally all the USB ports also should be blocked to avoid any access to information.

Back up your data

Back up regularly. If there is a data security incident, the only way to repair computer is to erase or to re-install the system.

Report

Document that presents information in an organised format for a specific audience and purpose is called as report (Fig. 4.12). Although summaries of reports may have been delivered orally, complete reports are almost always in the form of written documents.

Business reports is "organized, objective presentations of observations, experiences, or facts used in the decision-making process" - Kuiper and Clippinger.

Fig. 4.12: Report

A *technical report* is "a written statement of the facts of a situation, project, process or test; how these facts were ascertained; their significance; the

conclusions that have been drawn from them; and [in some cases] the recommendations that are being made" - Sharma and Mohan.

Types of reports include memos, minutes, lab reports, book reports, progress reports, justification reports, compliance reports, annual reports, policies and procedures.

Contents of Report

When writing a report, the aim should be to be absolutely clear. Above all, it should be easy to read and understand, even to someone with little knowledge of the subject area.

One should therefore aim for crisp, precise text, using plain English and shorter words rather than longer, with short sentences.

One should also avoid jargon. If specialist language has to be used, each word has to be explained as it is used. If there are too many such words, they may need to be replaced with simpler words.

Reports are usually written in passive voice and third person for example "It is recommended that the Chief Executive may like to consider....."

The report must be read and reread and edited for grammar, spelling, tenses, sense and style. It should be ensured that all relevant information has been included and any matter taken from other sources is properly referenced and acknowledged. The report is ready for dispatch when the report maker is fully satisfied that it fulfills its purpose.

Thus, reports are documentary evidence of the events and suggestions unit on it for implementation.

Reporting to Management

Reports perform the important management functions of Control, communication, feedback, analysis and persuasion in a common. All departments and all employees are required to give one or the other report to the management or to their superiors on regular basis. Such reports help to run the operations smoothly as the management remains aware of the work being done and the employees know what is expected.

In a warehouse there may be various un-even situation, like delay in supplies, unavailability of goods for reporting to the management becomes necessary. Similarly, as a result of inspections there may be some issues and suggestions which need reporting. Reporting has to be done timely for appropriate actions.

A sample Report Format is given below (Fig. 4.13):

REPORT OF DUPLICATE/INCORRECT/DAMAGED GOODS RECEIVED

TO BE COMPLETED BY DEPARTMENT:

 VENDOR NAME:

 ADDRESS:

 CONTACT NAME:

INVOICE NUMBER: DATE:

PURCHASE ORDER NUMBER:

CREDIT CARD PURCHASE: Yes/ No

REASON FOR FILING REPORT:

Fig. 4.13: **Report of duplicate/incorrect/damaged goods received (sample)**

Contents of a Report

A report may have some or all of the following:

- An Abstract or Executive Summary.

- Introduction.

- Details or description of the problem or situation or events about which the report is made.

- Observations and inferences of the report maker and carefully referenced views of others.

- An evaluation of the facts or the results of the above.

- Discussion of the likely outcomes of future courses of action.

- Recommendations as a course of action.

- Conclusions.

All of these elements will not be essential in every report. Many organisations use standard guidelines or structure for making various reports. A brief description of contents of report is as follows:

a) **Executive Summary:** The executive summary or abstract, for a scientific report, is a brief summary of contents. It is worth writing this last, when the key points to be drawn out are known. It should not be more than half to one page in length. The executive summary is designed to give busy 'executives' a quick summary of the contents of the report.

b) **Introduction:** is planned to be reported and provides summary of problem under discussion. It should touch concisely on the conclusions.

c) **Report Main Body**: The main content of report should be structured carefully

in a way that leads the reader through the issue.

d) Conclusions and Recommendations: The inferences drawn from the information to suggest how the situation can have improved, and should be specific, achievable and measurable. If the recommendations have financial implications, these should be set out clearly, with estimated costs if possible.

Company's Reporting to Management

Reporting to management is a critical process within a company that involves communicating relevant information, updates, and insights to key decision-makers (Fig. 4.14). This process ensures that the management team has a clear understanding of the company's performance, progress toward goals, challenges, and opportunities. Effective reporting helps managers make informed decisions and steer the company in the right direction. Here are some important aspects to consider when reporting to management:

Fig. 4.14: Company's Reporting to Management

1. **Frequency and Timing:** Determine how often reports should be submitted. This could be daily, weekly, monthly, or even quarterly, depending on the nature of the business and the information being reported.

2. **Key Performance Indicators (KPIs):** Identify and track the KPIs that are most relevant to the company's goals and objectives. These could include financial metrics (revenue, profit margins, etc.), operational metrics (production efficiency, customer satisfaction, etc.), and more.

3. **Data Accuracy and Integrity:** Ensure that the data presented in the reports is accurate, reliable, and up-to-date. Inaccurate data can lead to

misguided decisions.

4. **Clarity and Conciseness:** Present information in a clear, concise, and easily understandable manner. Avoid unnecessary jargon or technical language that might confuse non-experts.

5. **Visualisations:** Use graphs, charts, and other visual aids to represent data and trends. Visualisations can make complex information more digestible and help highlight important points.

6. **Trend Analysis:** Provide insights into trends and patterns over time. Comparing current data with historical data can offer valuable insights into the company's performance and trajectory.

7. **Highlighting Achievements and Challenges:** Report not only positive outcomes but also challenges and areas that need improvement. This transparency helps management address issues promptly.

8. **Narrative Context:** Provide context and explanations for the reported data. Help management understand the reasons behind certain trends or anomalies.

9. **Comparative Analysis:** Compare the company's performance to industry benchmarks or competitors. This can offer a broader perspective on the company's position in the market.

10. **Future Projections:** Include forecasts and projections based on available data. This helps management anticipate future challenges and opportunities.

Remember, effective reporting is not just about sharing data; it's about conveying insights that drive informed decision-making and contribute to the overall success of the company.

Corruption Practice

Corruption refers to the abuse of power, position, or authority for personal gain, often involving unethical or illegal behavior. Corruption practices can vary widely and may occur in various sectors, including government, business, healthcare, education, and more (Fig. 4.15). It's important to note that corruption is generally illegal and detrimental to the well-being of societies and organisations. Here are a few examples of corruption practices: (

Fig. 4.15: Corruption Practice

1. **Bribery:** Offering, giving, receiving, or soliciting something of value (such as money, gifts, or favors) to influence the actions or decisions of an individual in a position of power.

2. **Embezzlement:** Misappropriating funds entrusted to someone's care for personal use. This often involves diverting money from an organisation or institution for personal gain.

3. **Kickbacks:** Providing a portion of money or benefits received from a contract or transaction to the individual or entity responsible for awarding the contract. This can artificially inflate costs and lead to unfair deals.

4. **Nepotism:** Favoring family members or close friends in hiring, promotions, or other decision-making processes, regardless of their qualifications or merit.

5. **Extortion:** Forcing someone to do something against their will (such as paying money or providing goods/services) through threats, intimidation, or manipulation.

6. **Fraud:** Deliberately deceiving others for financial gain, such as inflating expenses, misrepresenting financial information, or creating fake transactions.

7. **Money Laundering:** Concealing the origins of illegally obtained money, typically by passing it through a complex sequence of banking transfers or commercial transactions.

8. **Conflict of Interest:** Engaging in actions that benefit a personal interest or relationship rather than the best interests of an organisation or the public.

Corruption undermines trust in institutions, distorts fair competition, impedes economic growth, and can have serious social and political consequences. Many countries have legal frameworks and organisations dedicated to combating corruption, and international efforts, such as the United Nations Convention against Corruption, aims to address this issue on a global scale.

Activities

Activity 1: Visit a warehouse and observe.

Material Required: Note Book , Pen/Pencil , Check list.

Procedure:

1. Visit a warehouse along with peers.

2. Meet the inventory executives and others and greet them.

3. Take a tour of the warehouse and enquire from the manager about the following:

   a) Applications to protect customer's information; data information related to business or commercial decisions and ensure it is not misused

   b) Security practices the firm has adopted

5. Show your notes to the executive and confirm.

6. Prepare a report and discuss with friends and show it to the teacher.

7. Discuss your report in the class.

Activity 2: Preparation of a Poster on conditions to prepare a report.

Materials Required: Pen/pencil, notebook, checklist.

Procedure:

1. Observe the event.

2. Write main happening chronologically.

   a) **Title Page**: Title, author, date.
   b) **Table of Contents**: Sections and page numbers.
   c) **Executive Summary**: Brief overview of the report's purpose, findings, and conclusions.
   d) **Introduction**: Background information, objectives, and scope.

e) **Methodology**: Procedures and methods used for data collection and analysis.

f) **Findings/Results**: Presentation of data, observations, and key results.

g) **Discussion**: Interpretation of findings, implications, and significance.

h) **Conclusion**: Summary of findings, key takeaways, and recommendations.

i) **References**: List of sources and citations.

j) **Appendices**: Additional material, data, or detailed explanations.

3. Draft report in simple language.

4. Give your suggestions.

5. Discuss in group about the findings.

6. Submit report to the teacher.

7. After this on the basis of conclusion prepare poster.

8. Prepare poster on conditions of report preparation.

Check Your Progress

A. Fill in the Blanks

1. _____ is the practice of protecting information.

2. Reports perform the important _____ functions of Control, communication, feedback, analysis and persuasion in a common.

3. Warehouse is the repository of several important _____.

4. Concealing the origins of illegally obtained money, typically by passing it through a complex sequence of banking transfers or _____ transactions.

5. _____ data can lead to misguided decisions.

B. Multiple Choice Questions

1. What does information security primarily aim to achieve according to the text?

a) Enhancing productivity

b) Protecting confidentiality, integrity, and data availability

c) Increasing data accessibility

d) Facilitating data modification

2. Which practice involves diverting money from an organization for personal gain?

a) Bribery

b) Embezzlement

c) Nepotism

d) Kickbacks

3. What is the purpose of the Executive Summary in a report?

a) Presenting detailed observations

b) Providing a brief summary of contents

c) Offering recommendations

d) Concluding the report

4. When is it recommended to use two-factor authentication for information access?

a) Always

b) Occasionally

c) Only during holidays

d) Only for public browsing

5. What is the potential consequence of fraud, corruption, or misconduct within a company?

a) Employee promotions

b) Company growth

c) Whistleblower reporting

d) Loss of reputation and legal actions

B. State whether the following statements are True or False

1. Any activity/incident needs to be reported to the management.
2. Report is a rough document that gives little information.
3. Information security's focus is the balanced protection of the confidentiality, integrity and availability of data.
4. Reports perform the important management functions of Control, communication, feedback, analysis and persuasion in a common.
5. Information security is the balanced protection of confidentiality, integrity and data availability while maintaining focus on effective policy enactment, all without hampering organisation's productivity.

D. Short Answer Questions:

1. What do you mean by information?
2. State the concept of Information Security.
3. Explain the concept of Report.

4. Write down essential content of Report.

E. Long Answer Questions

1. Discuss the importance of information security in the warehouse.
2. Describe the various information protection techniques.
3. Mention standard guidelines or structure for making various reports.

F. Check Your Performance

1. Prepare a report of duplicate/incorrect/damaged goods received.

Draw a chart showing various software developed to protect information

Session 3: Business Etiquettes and Code of Conduct

A Code of Conduct (CoC) defines how a company's or warehouse employees should act on a day-to-day basis. CoC originates from the company's core value and cultures and guides its daily behavior and operations. Most of the companies have documented CoC. Though every company will follow its own CoC, following are some of the common characteristics of most of the CoC:

1. **Documented:** Most companies document their CoC and it is readily available to all employees for understanding and reference.

2. **Management Support:** The CoC carries endorsement and approval of the senior management team. Being the leadership team, they have to constantly demonstrate their commitment to CoC.

3. **Comprehensive:** Most of CoC are elaborate and try to cover every aspect of company's business. They try to answer every possible question which employees may have during their day to day functioning.

4. **Lucid:** Most CoC are written in simple language which is easy for people to understand and comprehend. It should be visually appealing and generally created in the form of a small booklet.

The ethical behavior of the employees is regulated by codes of conduct. CoC clearly mentions the consequences, an employee, must go through in case of any violation of ethical norms or of the CoC guidelines. CoC guides the behaviour and conduct of the employees while dealing with external partners, customers and vendors. Following are the ways in which manager can drive the CoC guidelines to its team:

- Engage and explain the CoC to them.

- Invest in ethical training.

- Frequent reinforcements.

- Lead by example.

- Pair them with ethical peers.

- Reduce their opportunities or temptation for violations.

- Create an ethical culture.

As soon as an employee notices breach of CoC guideline or integrity by his/her colleague, he/she should immediately inform to the senior about the same. Depending upon the nature of breach, the senior may report to Ethics Committee or HR Head. Several companies follow a formal whistle-blower policy along with CoC. The management of the company should encourage periodic programmes to make sure that employees follow the CoC and ethics guidelines by the organisation.

Corrupt Practices

Corruption is understood as bribery and granting and accepting undue advantages (Fig. 4.16). Related offences could be fraud, embezzlement, document forgery and money laundering. Preventing corruption is essential for any organisation. It not only prevents any financial loss but also saves the company from any loss of reputation.

Following are some of the corrupt practices that can take place in a warehouse if the system is not at check -

- Stealing of materials if there is no proper picking system in practice and no security system on entry and exit of employees.

Fig. 4.16: Corrupt Practices

- Colluding with the transporter and excess dispatch of the material.

Alternatively, receipt of short material and not reporting.

- Fraudulent usage of warehouse receipts multiple times to raise credits.

- Inflating the transporter bills to raise more money.

- Dispatching the wrong or costlier material to the consignee.

- Obsolete safety and security equipment installation.

- Purchase of second hand MHEs and forging with the bills to raise funds.

- Maintaining wrong attendance records.

- Nepotism in hiring of warehouse employees.

- Stealing of data or information.

The warehouse manager has to ensure that there are enough check and balances in place to ensure no such violation takes place.

Business Etiquette

Etiquette means how to behave in different situations, it relates to code of behaviour among people within organisation group. For various office situations such as office meeting, client meeting, writing a mail, traveling, office party, meeting a client for the first time, require certain rules to be followed.

Code of Conduct are written rules of behavior, whereas Etiquettes are unwritten rules of behavior in workplace (Fig. 4.17).

Fig. 4.17: Code of Conduct

Etiquette includes knowing and respecting people's traditions, observing certain behaviour, actions in a group and appropriate manners.

Etiquettes are important for the following reasons:

- Helps you to earn respect.

- Charms your personality.

- Enables you to be confident in a variety of settings with a variety of people.

- Helps to improve relationships with colleagues, seniors and clients.

- Shows commitment to excellence and quality.

- Keeps you happy and motivated.

- Exhibits professionalism and develops a polished image.

Certain important business etiquettes areas are (Fig. 4.18):

- Dressing.

- Office party etiquette.

- Business travel etiquette.

- Proper greetings.

- Email etiquettes.

- Telephone/mobile manners.

- Office etiquette.

- Meeting etiquette.

- Cubicle etiquette.

- Business card etiquette.

- Different cultural etiquette & protocol.

Take Care of -
— Appropriate Text
— Subject Line
— Tone
— Proofread
— Plan
— Language
— Edit

- Identify yourself and your company.
- Ask the person if he or she has time to talk.
- Address the caller by his name in a courteous manner
- Make calls during normal business hours.
- Never put someone on hold without asking permission
- Do not do other work while on the phone
- Summarize the discussion

Fig. 4.18: Office Etiquette

Warehouse Etiquettes

➢ Keep it Clean - To maintain proper cleanliness in the warehouse.

> Aim for Accuracy - To maintain the stock in a proper way so that all the goods can be adjusted then and there.

> Talk it Out - Warehouse associate must be available.

Safety is Sixth S - Warehouse Associate must maintain 6S they are Stand, Smile, See, Shake hands, Speak and Say (Fig. 4.19).

1	Stand	Shows Respect
2	Smile	Encourages a smile from the recipient
3	See	Look into recipient's eyes
4	Shake hands	Utilize proper greeting with a firm Handshake
5	Speak	Speak your name slowly and distinctly
6	Say	Address the recipient with their name

>

Fig.:4.19: Six "S" Meetings and Greetings

Meaning of Nepotism

Nepotism is the practice of using your position or influence to secure favorable treatment for members of your family, including favorable employment opportunities. Nepotism would manifest itself, for instance, a manager choosing his son-in-law for a promotion over another qualified applicant. Nepotism can occur when a person having less capability is hired only because they have connection with boss.

Activities

Activity 1: Visit a warehouse and observe.

Material Required: Note Book, Pen/Pencil, Check list.

Procedure:

1. Visit a warehouse along with peers.

2. Meet the inventory executives and others and greet them.

3. Take a tour of the warehouse and enquire from the manager about the following:

   a) Practice of ethics in day-to-day processes and dealings with customers and colleagues.

   b) Consult supervisor or senior management when in situations that may

require differentiating between ethical and unethical.

    c) Dress up and conduct in a professional manner.

    d) How to communicate with clients and stakeholders in a soft and polite manner and follow etiquettes in accordance to the place.

5. Show your notes to the executive and confirm.

6. Prepare a report and show it to the teacher.

7. Discuss your report in the class.

Activity 2: Visit to a warehouse to know how to avoid acceptance of cash or kind from vendors for support or contract negotiations.

Material Required: Note Book , Pen/Pencil , Checklist.

Procedure:

1. Visit a warehouse along with peers.

2. Meet the Warehouse associate and other employees in the warehouse.

3. Take a tour and enquire to Warehouse associate about the following:

    a) Avoid acceptance of cash or kind from vendors for support or contract negotiations.

    b) How vendor contracts are negotiated, the criteria for selecting vendors, and the importance of fair business practices.

    c) Consider how the insights gained align with your own understanding of ethical business practices.

    d) Highlighting key takeaways and observations related to avoiding acceptance of cash or kind from vendors for support or contract negotiations.

    e) Provide feedback to the warehouse management about the visit and present that report in class.

4. Prepare a report and submit it to your teacher.

Activity 3: Prepare a report of violations of code of ethics.

Material required: Check list, Notepad, pen /pencil, drawing sheet, color pencils.

Procedure:

1. Collect the materials required to draw the flow chart.

2. Draw a chart containing violations of code of ethics.

    a) Confidentiality Breach
    b) Conflict of Interest
    c) Fraud and Deception
    d) Discrimination and Harassment

   e) Theft and Embezzlement

   f) Bribery and Corruption

3. Check the characteristics from the textbook and from what teacher taught in the class.

4. Ensure about your work completion.

5. Discuss with the classmates in front of your teacher.

6. Write the conclusion.

Check Your Progress

A. Fill in the Blanks

1. A _____ defines how a company's or warehouse employees should act on a day-to-day basis.

2. _____ is understood as bribery and granting and accepting undue advantages.

3. _____ simply means how to behave in various situations, it relates to a code of behaviour among people within an organisation group or society.

4. The _____ behavior of the employees is regulated by codes of conduct.

5. _____ can occur when a person having less capability is hired only because they have connection with boss.

B. Multiple Choice Questions

1. What is the primary purpose of a Code of Conduct (CoC) in a company or warehouse?

   a) Enhancing competition

   b) Guiding daily behavior and operations

   c) Increasing operational complexity

   d) Reducing employee engagement

2. How can a manager effectively drive CoC guidelines within a team?

   a) Encourage violations for learning

   b) Lead by unethical examples

   c) Reduce ethical training programs

   d) Engage, explain, and reinforce ethical behavior

3. What is a common way to prevent corrupt practices in a warehouse?

a) Encouraging nepotism

b) Implementing a robust picking system

c) Allowing fraudulent usage of warehouse receipts

d) Ignoring security equipment installation

4. What is the purpose of business etiquette in the workplace?

a) Discouraging professionalism

b) Improving relationships and respect

c) Promoting conflicts

d) Reducing confidence in different settings

5. What does the term "Nepotism" refer to in a workplace context?

a) Ethical training programs

b) Employee engagement practices

c) Favorable treatment for family members

d) Warehouse security measures

C. State whether the following statements are True or False

1. Code of Conduct are written rules of behavior, whereas Etiquettes are unwritten rules of behavior in the workplace.
2. Nepotism is the practice of using your position or influence to secure favorable treatment for members of your own family, including favorable employment opportunities.
3. CoC do not guide the behavior and conduct of the employees while dealing with external partners, customers and vendors.
4. Office meeting, client meeting, writing a mail, traveling, office party, meeting a client for the first time, don't require any rules.
5. Related offences could be fraud, embezzlement, document forgery and money laundering.

D. Short Answer Questions

1. Define Code of Conduct.
2. What do you mean by Warehouse Etiquettes?
3. Explain Nepotism.

E. Long Answer Questions

1. Describe the key principles of code conduct.
2. List the possible corrupt practices in a warehouse.
3. Explain the meaning and importance of etiquette.
4. Describe the key business etiquettes.

F. Check Your Performance

1. Draw a chart showing Six "S" Meetings and Greetings.
2. Draw a chart showing Office Etiquette to be kept in mind during office.

Session 4: Document Integrity and Ethics Violation

Document integrity means that no one has changed the original document. It means that presenting a document that is not a forgery.

"Ethics" are the principles that guide behavior.

Ethics violation means a company's documented code of ethics, mission, vision, values and culture can be violated (Fig. 4.20).
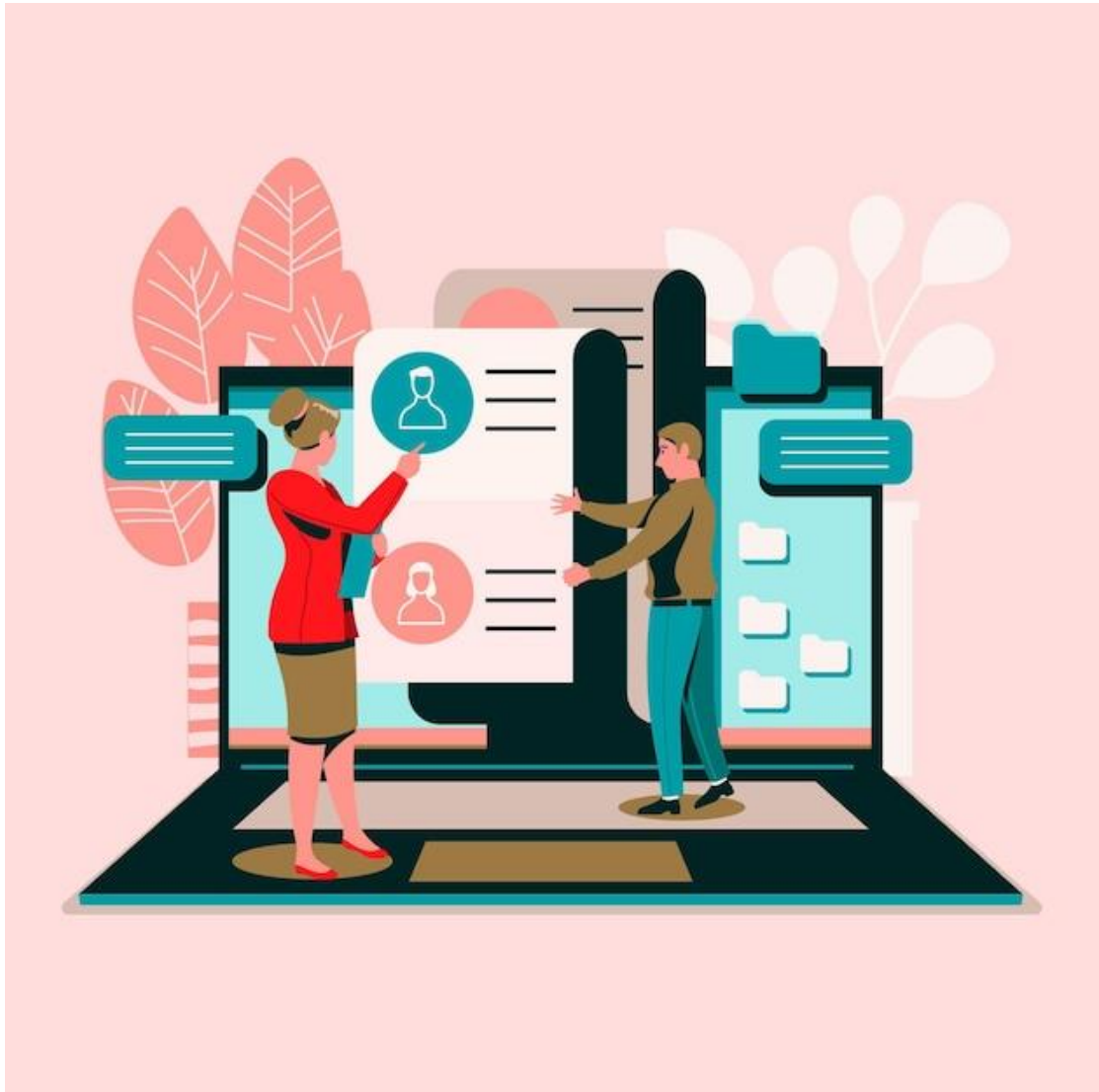
Fig. 4.20: Ethics Violation

ETHICS PROBLEMS IN WAREHOUSES

The lesson here is to pay attention when staff members raise ethical concerns. Employees, the warehouse, and the supply chain as a whole gain from it.

1. **Skipping Safety Training-** Ethics are sometimes neglected in crowded warehouses in an effort to do more. This can entail skipping crucial safety training. A general overview may be given to new hires before they are thrust into the position rapidly. They are urged to go above and beyond call of duty in order to complete the task more quickly rather than following advised safety procedures. They run the risk of harming themselves and others, destroying property, and damaging goods.

2. **Using Sub-Par Safety Equipment-** It's not uncommon for companies to use much older equipment without built-in safety precautions. They continue to use risky equipment that put workers at risk rather than modernising.

3. **Not Enough Employees-** Businesses want to get more done while spending less on employees. Many warehouses have switched to automated methods. However, a dangerous warehouse ethics problem is not having enough employees to safely do the job.

4. **Using Cheap Labour-** some workers may not even care about their fellow employees. Some may go so far as to sabotage equipment to cause harm to the business.

5. **It Pays to Be Ethical-** The truth is that unethical warehouses don't actually make more money. It even costs them. Because damaged goods damage suppliers' reputations, they may discontinue utilising particular warehouses. Finding good personnel becomes challenging when a warehouse develops a reputation for not treating employees fairly. Additionally, workers' lawsuits eventually succeed, which can entirely devastate a corporation.

Escalation Matrix

Most of the organisations do follow a formal escalation matrix. In case associate finds a violation or a practice which is large enough and demands bigger intervention he/she may report to senior authorities. Also, in case, the reporting of the violations goes unattended and unaddressed he/she may follow the escalation matrix. The following grid shows a sample escalation matrix (Fig. 4.21).

Fig. 4.21: Escalation Matrix

A tool for managing the flow of work is an escalation matrix. It is referred to as a process map, and it aids in your understanding of what transpires in the event that a problem or other undesirable event occurs in your company.

If five employees are working together in one area and they all require assistance with their projects at the same time, this could cause issues if there isn't enough time for them all to access the resources needed by each employee. This is a good example of how an escalation matrix works.

Types of Escalation

Following are the types of Escalation Matrix (Fig. 4.22):

Fig. 4.22: Types of Escalation Matrix

1. **Hierarchical Escalation**- The most typical type is hierarchical escalation. Support tickets escalated created on seniority & previous experience by the team/individual addressing related issues. After the matter has been escalated by a supervisor, an account manager may take it to head of sales.

2. **Functional Escalation**- When a problem is functionally escalated, anyone or whichever team has the necessary expertise to resolve it, regardless of position or hierarchy, will take care of it. The accounts and invoicing department might be needed for assistance with a forthcoming payment.

3. **Automatic Escalation** - Project issues are automatically forwarded to the next level by call center software when a predetermined length of time has passed without a resolution.

4. **Priority Escalation**- The problem is escalated to the team leader and higher levels more quickly since it is given priority. An IT problem that necessitates frequent phone calls will be given higher importance than supply delivery. When you discover a critical concern, get in touch with right support group.

Process of Escalation Matrix

The primary step is to identify issue and its root cause. next, decide what course of action has to be performed to fix the issue. this can be accomplished by reviewing prior incidents or instances where identical issues have been successfully resolved. Any organisation can use an escalation matrix as a crucial tool to increase the effectiveness of its procedures. It clarifies the proper methods

for carrying out various jobs and aids in locating any process bottlenecks as well as potential areas for improvement.

Managing Deviations

Warehouse associate is an individual who carries out the operations on the shop floor. There might be some discrepancies and damages to the goods while carrying the warehouse operations (put away, picking, packing, returns, etc.) The associates report all these damages and losses to the warehouse supervisor/manager for his/her actions. There is a procedure framed by the organisation for dealing with loss or damages to goods. The individual as a warehouse associate has to be well aware of these reporting procedures for safe and structured operations. The warehouse associate needs to report the problems to the warehouse supervisor for corrective measures. If the warehouse associate discovers any corrupt practice by any of its colleague, vendor or customer he/she should immediately report to his/her supervisor or follow the rules framed by the organisation.

Certain organisation provides an email ID or telephone number where all such incidents must be reported. The associates should never try to confront the person or try to correct the unethical practices on their own. Their job is always to report and let higher authorities take appropriate action (Fig. 4.23).

Fig. 4.23: Managing Deviations
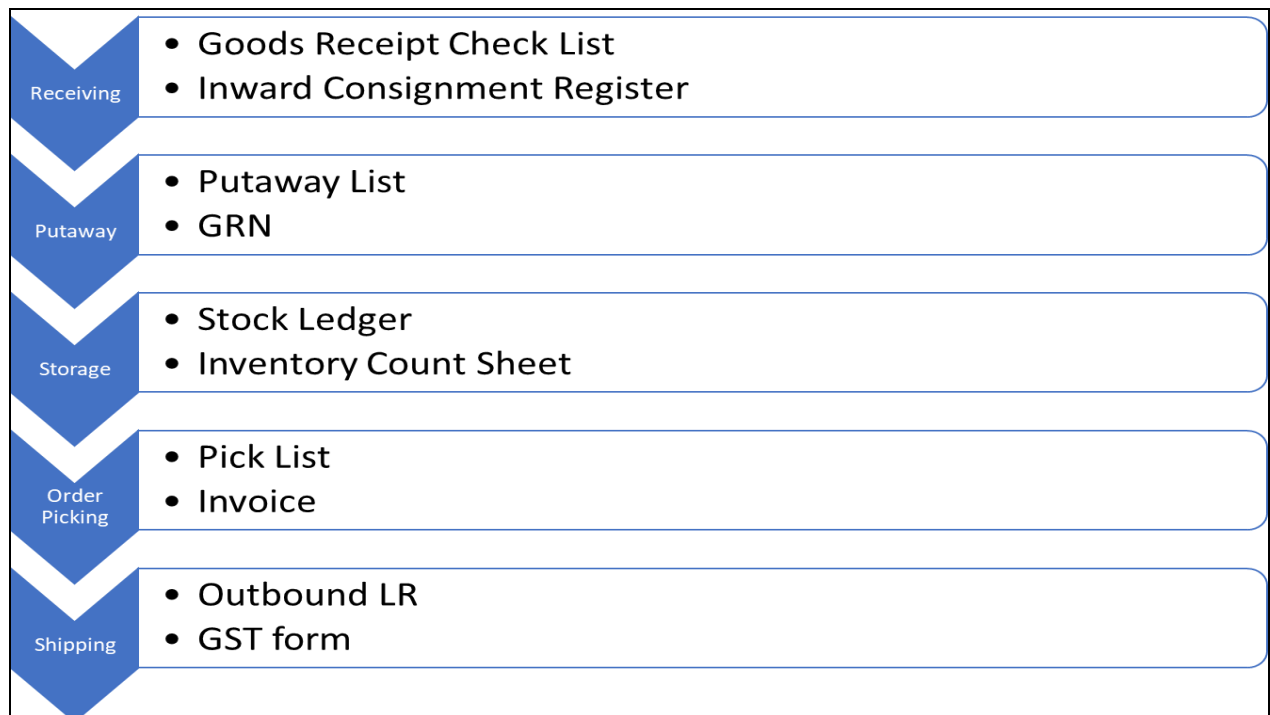
Meaning of PPE

Personal Protective Equipment (PPE) is specialised clothing or equipment worn by an employee for protection against infectious materials. It may include items like safety glasses, gloves, earplugs, respirators and full body suits. It is used to prevent exposure to infectious material. It acts as barrier to stop the spread of germs.

Types of Warehouse Documents

Documentation is another vital part of warehousing operations. The way, bank is the custodian of depositor's money, warehouse is also the custodian of the value in the form of inventory. Any loss to inventory is a loss of money. Documentation carries following purposes in a warehouse:

1. **Operations Management**: Documents like pick-list, Goods Receipt Check List (GRCL), Bill of Material (BOM) are several others which are essential to conduct warehousing operations on day to day basis.

2. **Record Keeping**: The inventory stored in the warehouse carries economic value. One of the functions of stores is to maintain account for material received in stores and outgoing materials so that proper accounting and audit trail is maintained.

3. **Transit Documentation**: Whenever the goods are transported from the warehouse to the consignee, they need to carry the transit documentation. Transit documents meet the regulatory requirements during transit in India and establish the consignor, consignee and nature of the goods being transported.

4. **Audits**: Warehousing are subject to frequent audits for inventory reconciliations, adherence to Standard Operating Procedures (SOP) and regulatory compliances. Documentation provides the complete history and trail of all the transactions which happened in the warehouse.

Following are the key documents used during these five stages (Fig. 4.24)

Stage	Documents
Receiving	• Goods Receipt Check List • Inward Consignment Register
Putaway	• Putaway List • GRN
Storage	• Stock Ledger • Inventory Count Sheet
Order Picking	• Pick List • Invoice
Shipping	• Outbound LR • GST form

Fig. 4.24: Documentation in Warehouse

Inward Consignment Register

This is a register which is used to record all the incoming shipments into the warehouse (Fig. 4.25).

	Gate Inward Register									
Sl no.	Material Receiving Date	Invoice Number	Invoice Date	Supplier Name	Name of Place / City	Material Description	Qty Received	Qty Delivered	Material Deliver's name	Invoice Details

Fig. 4.25: Inward Consignment Register

Goods Receipt Check List (GRCL)

It is a check list to be followed at the time of receipt of material at the warehouse.

Goods Receipt Note (GRN)

When the incoming shipment details are entered into the system, the computer system generates a document called Goods Receipt Note (GRN) (Fig. 4.26).

eZee Technosys Pvt. Ltd.
International Trade Center
Majura Gate

Goods Receipt Note

GRN #	CSGRN20	Vendor	Seven Eleven
Voucher No	123	Reg. No.	12
Date	29-03-2019	Print Date	29-03-2019 1227:39
Receiving Store	Central Store	Print By	Admin
Purchase Order#	CSON22		

Item Name	Quantity	Unit	Rate	Dis. Amount	Tax	Amount
Ajwaan	2.000	Kgs	120.0000	0.0000	48.0000	288.0000
Action	10.000	Pair	6.8100	0.0000	0.0000	68.1000

Total	Amount	Tax	Discount %	DiscountAmount	Add/Less	Bill Amount
	308.1000	48.0000	0.0000	0.0000	0.0000	356.1000 $

Purchasing Clerk _____   Store _____

Director / Manager _____   Security _____

Fig. 4.26: Goods Receipt Note (GRN)

Stock Ledger: This is a ledger which maintains the inwards and outward entries of various products and indicates the current stock level at any point of time.

Pick List: This document indicates the various products, their quantities and locations to process a customer order.

Sale Invoice: This is important document evidencing the sale and transfer of ownership of the goods from the warehouse to the buyer.

Lorry Receipt (L/R): It is acknowledgement of goods given by lorry owners to an individual who is sending the goods.

Transit Documents: These are regulatory documents which are required during transit in India. These could be documents such as filled GST Transit forms.

Safety Data Sheet

Safety Data Sheet (SDS), Material Safety Data Sheet (MSDS) or Product Safety Data Sheet (PSDS) is a document that contains information on safety and health protection when working with various substances and products.

• Safety data sheet (formerly known as Material Safety Data Sheet) contains information such as the properties of each chemical. Risks to health, and the environment; Safety measures; and precautions when handling, storing, and transporting the chemical.

• Provides clues for each chemical:

1. Personal protective equipment (PPE).

2. First aid procedure.

3. Spill cleaning procedure.

All employees are trained to read, understand, and access safety data sheets.

The safety rules and procedures to be followed in a hazardous cargo warehouse:

Hazardous material is one which is capable of producing effects such as fire, explosion, sudden release of pressure and may cause acute health effects like burns, injuries, convulsions or even organ damage. In spite of several challenges hazardous material is required in various stages of manufacturing and need to be stored in a warehouse. Following are some of the suggestions for handling hazardous material in the warehouse:

Staff needs to be certified for handling dangerous goods:

The storage and transport of dangerous goods is a complex practice. It requires detailed knowledge of the relevant regulations. The people in warehouse need to the have the knowledge & skills for dealing with transportation and security of hazardous materials/dangerous goods. Trained staff with right knowledge and skills know about the risks involved and how to work with these risks. Without training it is extremely difficult to achieve a detailed understanding of the regulations.

Some hazardous goods need to be stored separately as per their classification:

Dangerous goods are incompatible with additional substances. It is a legal requirement that dangerous goods which are not compatible with additional substances are stored and handled separately. Avoid interaction that creates serious risks for incidents. A good warehouse and organisation know this and use a barrier or a suitable separation distance to avoid problems.

Documentation should be up-to-date and available to staff at all locations to enable them to perform their role in the quality system:

The people in warehouse should be aware of the cargo and goods that are stored at any minute. Nobody expects an incident involving dangerous goods but in case it happens, it is better to be prepared. Having precautionary statements near the dangerous goods everybody must know what must be done when an incident happens. And with proper work instruction cards every employee, even those who are less trained, can follow instruction. Avoid a surprise and have documentation complete. Below is a ready checklist for associates to refer while conducting the inspection for dangerous/hazardous cargo in warehouse (Fig. 4.27)

Hazardous Material Check List		
1	Product Name	
2	Hazard Class	
3	PPE required to handle	
4	Engineering Controls/ Ventilation	
5	Special Handling Procedures	
6	Storage Requirements	
7	Special Containment	
8	Accident Procedures	
9	Waste Disposal	
10	Special Precautions	
11	Decontamination	
12	Designated Areas	
13	Approved by	

Fig. 4.27: Checklist for Dangerous cargo inspection

Activities

Activity 1: Visit a warehouse and ask questions from inventory manager.

Material Required: Note Book, Pen/Pencil, Check list.

Procedure:

1. Visit a warehouse along with peers.
2. Meet the inventory executives and others and greet them.

3. Take a tour of the warehouse and enquire from the manager about the following:

   a) Understanding the process and interpersonal communication with clients.

   b) Checking regulatory documentation and compliances for the shop floor as per information from the supervisor.

   c) How Personal Protective Equipment (PPE) in accordance to regulatory requirements is used.

   d) Identify the different types of dangerous goods and handling methodologies.

   e) Following the SOP for handling of different types of dangerous goods.

   f) Consulting supervisor or senior management when in situations that may require differentiating between ethical and unethical and report all regulatory violations.

5. Show your notes to the executive and confirm.

6. Prepare a report and discuss with classmates and show it to the teacher.

7. Discuss your report in the class.

Check Your Progress

A. Fill in the Blanks

1. The work ethics of shouldering the responsibility and not blaming others is called _____.

2. Contract Labour (Regulation & Abolition) Act is applicable if ____ or more people are working in the warehouse on Contract.

3. Employees State Insurance Act is applicable for any shops and establishments employing _____ or more persons.

4. Employees exceeding Rs. _____ salary are not entitled to get bonus as per the Payment of Bonus Act.

5. The movement of cargo over river and canals is called _____.

6. This position responsible for managing all outbound transportation from the warehouse is _____.

7. _____is an acknowledgement of goods given by the transporter to the warehouse at the time of dispatch of goods.

8. The document used to gather the material as demanded by the customer is called the _____.

B. Multiple Choice Questions

1. Which of the following is not a dimension of work ethics?

   a) Punctuality
   b) Keenness to learn
   c) Health conscious
   d) Productivity

2. As per regulatory norms the minimum amount of the bonus to be paid is _____% of salary.

   a) 8.33%

   b) 20%

   c) 10%

   d) 6.67%

3. Which of the following is not an area where business etiquettes need to be followed?

   a) Conversing on mobile with client.

   b) Writing emails to senior.

   c) Sending WhatsApp message to a friend.

   d) Attending an office party.

4. Which of the following is not a method to protect information and data in the warehouse?

   a) Physically locking the desktop CPU at the time of leaving the warehouse.

   b) Two level authentications.

   c) Using licensed software.

   d) Frequently visiting anti-virus and protection sites.

5. The correct sequence of supply chain process is.

   a) Plan – Make - Source – Make – Return.

   b) Plan – Source – Make – Deliver – Return.

   c) Plan – Make – Deliver – Source – Return.

   d) Plan – Source – Deliver - Make – Return.

6. Which of the following is not a classification of equipment being used in the warehouse?

   a) Storage.

b) Safety.

c) Earth moving.

d) Material handling.

7. Which of the following activity is part of the shipping activity in the warehouse process?

a) Order processing.

b) Unload vehicle.

c) Cycle count.

d) Filling bill of transport.

8. Which of the following is not a role played by the warehouse?

a) Consolidation hub.

b) Break bulk.

c) Value added services.

d) None of the above.

C. State whether the following statements are True or False

1. Explaining the Integrity concepts to Associate at the time of joining is enough. No need to reinforce them.

2. Employees Provident Fund Act is only applicable for on roll employees. It is not applicable for contracted employees.

3. There is a single Minimum wage across the country decided by the Central Government every six months.

4. The biggest lesson for Associate of the company's Code of Conduct is the conduct of the Warehouse Manager.

5. Logistics management is part of supply chain management.

6. Among all modes, water is the cheapest mode of transport.

7. Audit is not one of the requirements for conducting documentation in the warehouse.

8. Security guards and warehouse associate are two independent set of people in the warehouse who hardly interact with each other.

D. Short Answer Questions

1. State the meaning of document integrity and ethics violation.
2. What do you mean by Managing Deviations?
3. Define Escalation Matrix?

4. What do you mean by Safety Data Sheet?

E. Long Answer Questions

1. Explain the importance of documentation in warehousing.

2. Detail the various documents used in warehousing operations.

3. Classify the hazardous materials.

4. Explain the concept of safety data sheet.

5. Describe the various do's and don'ts in handling hazardous chemicals.

F. Check Your Performance

1. Draw a chart of Escalation Matrix.
2. Draw a chart showing Performance of Inward Consignment Register.
3. Draw a chart showing Classification of Dangerous Goods Escalation Matrix

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Answer Keys

MODULE 1:   HANDLING OF PERISHABLE GOODS

SESSION 1: PERISHABLE GOODS

A. Fill in the Blanks:

1. expiry

2. shelf life

3. damp

4. red

5. SKU (Stock Keeping Unit)

6. retail

7. Barcode

B. Multiple Choice Questions:

1. b

2. d

3. a

4. d

5. d

6. d

7. a

8. d

C. State whether the following statements are True or False:

1. True
2. True
3. False
4. True
5. True

SESSION 2:   SORTING AND GRADING OPERATIONS

A. Fill in the Blanks:

1. Cold storage
2. series
3. RFID tag
4. logistics
5. Perishable
6. thermometer.
7. Grading

B. Multiple Choice Questions:

1. d
2. b
3. a
4. b
5. d
6. b

C. State whether the following statements are True or False:

1. False
2. False
3. True
4. True
5. True

SESSION 3:   MATERIAL HANDLING EQUIPMENT AND USAGE

A. Fill in the Blanks:

1. Warehouse equipment

2. unloading.

3. Temperature

4. Flow-through

5. Organizational procedures

6. Hygiene

B. Multiple Choice Questions:

1. d
2. a
3. c
4. a
5. d

C. State whether the following statements are True or False:

1. True
2. False
3. True
4. False
5. True

SESSION 4:   CONTAMINATED GOODS AND PROCEDURE OF   QUARANTINE

A. Fill in the Blanks:

1. contamination
2. harvested.
3. Contamination
4. hygiene
5. pallets
6. vegetables
7. Cold storage
8. regular basis

B. Multiple Choice Questions:

1. d
2. c
3. d
4. a
5. d

C. State whether the following statements are True or False:

1. True
2. True
3. False
4. True
5. True
6. True
7. True

MODULE 2: HANDLING OF FAST-MOVING CONSUMER GOODS

SESSION 1: FMCG WAREHOUSE GOODS MOVING PROCESS

A. Fill in the Blanks:

1. process

2. standard

3. workflows

4. Dependent

5. Independent

B. Multiple Choice Questions:

1. a
2. d
3. d
4. b
5. d

C. State whether the following statements are True or False:

1. True
2. False
3. True
4. False
5. False
6. True

SESSION 2: PICKLIST AND INFORMATION PROCESSING DEVICES

A. Fill in the Blanks:

1. orders
2. electronic
3. SKU (Stock Keeping Unit)
4. data input
5. barcode scanner

B. Multiple Choice Questions:

1. c
2. b
3. c

4. b

5. c

C. State whether the following statements are True or False:

1. False
2. True
3. True
4. True
5. False
6. True

SESSION 3: SORTING, PLACING AND PACKING OF GOODS

A. Fill in the Blanks:

1. packaging

2. Labeling

3. accidents

4. damage

5. pallet trucks

B. Multiple Choice Questions:

1. c

2. c

3. d

4. c

5. c

C. State whether the following statements are True or False:

1. True
2. True
3. False
4. True
5. True

SESSION 4: INVENTORY MANAGEMENT

A. Fill in the Blanks:

1. supply chain

2. Just-in-time (JIT)

3. FIFO (First-In, First-Out)

4. LIFO (Last-In, First-Out)

5. Cycle counting

B. Multiple Choice Questions:

1. d
2. d
3. a
4. c
5. b

C. State whether the following statements are True or False:

1. True
2. True
3. False
4. False
5. True

MODULE 3: HANDLING OF AUTOMOTIVE GOODS

SESSION 1:   PACKING AND LABELING OF AUTOMOTIVE GOODS

A. Fill in the Blanks:

1. Packaging
2. Labeling
3. Palletisation
4. Racking
5. packaging
6. warehouse
7. Coding
8. Block and Stacked
9. logistics
10. Wood packaging

B. Multiple Choice Questions:

1. c
2. d
3. a
4. c
5. c

C. State whether the following statements are True or False:

1. False
2. True
3. False
4. True
5. False
6. False
7. False
8. True
9. True
10. True

11. True

12. True

SESSION 2: LOADING-UNLOADING AND MATERIAL HANDLING

A. Fill in the Blanks:

1. Warehouse.

2. transportation.

3. Material handling equipment

4. securing and bracing

5. Adjustable

6. stable.

7. Racking

B. Multiple Choice Questions:

1.b

2.c

3.a

4.c

5.b

C. Match the Columns:

1. B

2. E

3. A

4. D

5. C

D. Identify the symbols and write its name:

1. Hand Truck

2. Counterbalanced Fork Lift Truck

3. Dock Leveler

4. Manual Material Handling

5. Pallet Positioners for Ergonomic Operations

SESSION 3:   INVENTORY MANAGEMENT AND PROCESS IMPROVEMENT TOOLS

A. Fill in the Blanks:

1. Inventory management

2. cost

3. Cards

4. JIT

5. mistake-proofing.

B. Multiple Choice Questions:

1.b
2.c
3.b
4.b
5.c

C. State whether the following statements are True or False:

1.True
2.False
3. True
4.False
5.True

D. **Match the Columns:**

1. D
2. A
3. B
4. E
5. C

SESSION 4:   INVENTORY COUNT, DANGEROUS PRODUCT HANDLING AND DAILY REPORTING

A. Fill in the Blanks:

1. inventory management

2. stocktaking.

3. Non-conforming goods

4. Distribution center

5. Safety protocols

B. Multiple Choice Questions:

1.c
2.c
3.b
4.c
5.a

C. State whether the following statements are True or False:

1. True

2. True
3. True
4. False
5. True

MODULE 4: INTEGRITY AND ETHICS

SESSION 1: COMPANY'S POLICIES AND REGULATORY REQUIREMENTS

A. Fill in the Blanks:

1. Integrity
2. Ethical principles
3. Warning
4. Warehouse Associate
5. Bonus

B. Multiple Choice Questions:

1. b
2. c
3. c
4. c
5. c

C. State whether the following statements are True or False:

1. True
2. False
3. True
4. False
5. True

SESSION 2: DATA INTEGRITY AND SECURITY PRACTICES

A. Fill in the Blanks:

1. Information security
2. communication
3. data
4. Commercial
5. Inaccurate

B. Multiple Choice Questions:

1. b
2. b
3. b
4. a

5. d

C. State whether the following statements are True or False:

1. True
2. False
3. True
4. True
5. True

SESSION 3:   BUSINESS ETIQUETTES AND CODE OF CONDUCT

A. Fill in the Blanks:

1. Code of Conduct

2. Corruption

3. Etiquette

4. Ethical

5. Nepotism

B. Multiple Choice Questions:

1. b
2. d
3. b
4. b
5. c

C. State whether the following statements are True or False:

1. True
2. True
3. False
4. False
5. True

SESSION 4:   DOCUMENT INTEGRITY AND ETHICS VIOLATION

A. Fill in the Blanks:

1. accountability

2. 20

3. 10

4. 21,000

5. inland water transport

6. Transportation Manager

7. LR (Lorry Receipt)

8. picklist

B. Multiple Choice Questions:

1.c
2.a
3.c
4.d
5.b
6.c
7.d
8.b

C. State whether the following statements are True or False:

1. False
2. False
3. False
4. True
5. True
6. True
7. False
8. False

Glossary

Word	Meaning
Perishable Goods	Items that have a limited shelf life and are prone to decay or spoilage.
Sorting Operations	The process of arranging items systematically based on specific criteria, such as type, size, or quality.
Grading Operations	Evaluating and categorizing goods based on predetermined standards, often related to quality or size.
Material Handling Equipment	Tools and machinery used for the movement, storage, and control of materials within a warehouse or distribution center.
Contaminated Goods	Products that have been exposed to harmful substances or impurities, rendering them unsafe for consumption or use.
Quarantine	A set of measures implemented to isolate and control goods suspected of contamination or those requiring

Procedure	further inspection before being released for distribution.
Fast-Moving Consumer Goods (FMCG)	Products with a high consumer demand that typically have a short shelf life, including items like food, beverages, and toiletries.
Warehouse Goods Moving Process	The systematic steps involved in transferring products within a warehouse, encompassing picking, packing, and shipping.
Picklist	A document or electronic record that specifies the items and quantities to be picked from the warehouse for order fulfillment.
Information Processing Devices	Tools, devices, or systems used to capture, process, and manage data related to warehouse operations.
Sorting of Goods	Organizing products based on specific characteristics, facilitating efficient storage and retrieval.
Placing of Goods	Allocating items to designated storage locations within the warehouse based on their characteristics and demand.
Packing of Goods	The process of preparing products for shipment by placing them in suitable containers or packaging.
Inventory Management	The systematic control and supervision of stock, including ordering, storage, and tracking of goods.
Automotive Goods	Products related to the automotive industry, such as spare parts, accessories, or vehicles.
Packing of Automotive Goods	The specific process of preparing automotive products for storage or shipment.
Labeling of Automotive Goods	Attaching informative tags or labels to automotive items for identification, tracking, or regulatory compliance.
Loading-Unloading	The process of placing goods onto or removing them from a vehicle, typically during the shipment process.
Inventory Count	The periodic process of physically counting and verifying the quantity of items in stock to reconcile with recorded data.
Dangerous Product Handling	Procedures and precautions for safely managing goods that pose a risk to health, safety, or the environment.

Daily Reporting	Providing regular updates or summaries of warehouse activities, performance, or incidents on a daily basis.
Integrity and Ethics	Upholding honesty, moral principles, and adherence to ethical standards in all aspects of warehouse management.
Company's Policies	The established rules, guidelines, and principles that govern the conduct and operations of a company.
Regulatory Requirements	Mandates and standards set by governing bodies that an organization must comply with to operate legally and ethically.
Data Integrity	Ensuring the accuracy, consistency, and reliability of data throughout its lifecycle.
Security Practices	Protocols and measures implemented to safeguard warehouse assets, information, and personnel.
Business Etiquettes	Conventional norms and polite behavior expected in professional and business settings.
Code of Conduct	Written guidelines outlining expected behavior and ethical standards for employees within an organization.
Document Integrity	Ensuring the accuracy, completeness, and authenticity of written or electronic records.
Ethics Violation	Breach or disregard of ethical standards and principles within an organization.
Handling Procedures	Standardized methods and protocols for managing various types of goods and materials.
Warehouse Operations	The overall activities and processes involved in the functioning of a warehouse, including receiving, storing, and shipping.
Supply Chain	The network of interconnected entities and processes involved in the production, distribution, and delivery of goods.
Quality Control	Measures and processes implemented to ensure that products meet predefined quality standards.
Product Lifecycle	The stages of a product's existence, from development and introduction to market withdrawal.
RFID Technology	Radio-frequency identification technology used for tracking and managing inventory using electronic tags.

Barcode Scanning	The use of barcode readers to capture and process information encoded in barcodes for inventory management.
Inventory Tracking	Monitoring and managing the movement and quantities of goods within the warehouse.
Shipment Verification	Confirming that the shipped products match the details specified in the order and documentation.
Hazardous Materials	Goods that pose a risk to health, safety, or the environment due to their chemical or physical properties.
Compliance Standards	Adhering to legal, industry, or internal regulations and standards governing warehouse operations.
Occupational Safety	Practices and measures implemented to protect the health and well-being of warehouse personnel.
Cross-Docking	An inventory management strategy where goods are directly transferred from inbound to outbound transportation with minimal storage.
Demand Forecasting	Estimating future product demand based on historical data and market trends.
Shelf Life	The period during which a product remains suitable for use, sale, or consumption.
FIFO (First In, First Out)	A method of inventory management where the oldest stock is used or sold first.
LIFO (Last In, First Out)	A method of inventory management where the newest stock is used or sold first.
SKU (Stock Keeping Unit)	A unique identifier assigned to a product for inventory tracking and management.
Replenishment	The process of restocking and maintaining optimal inventory levels.
Cycle Counting	Periodic and continuous counting of a subset of inventory items to ensure accuracy.