सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

FICSI
Food Industry Capacity and Skill Initiative

Participant Handbook

Sector
Food Processing

Sub-Sector
Generic

Occupation
Food Sales and Retail Operations

Reference ID: **FIC/Q9701; Version:2.0**
NSQF Level 3

Food Sales Promoter

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Skilling is building a better India. If we have to move India towards development then Skill Development should be our mission.

Shri Narendra Modi
Prime Minister of India

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The Industry feedback has been highly encouraging from inception to conclusion & it is with their input we have tried to bridge the skill gaps existing today in the Industry. This participant handbook is dedicated to all aspiring youth who desire to achieve special skills which would be a lifelong asset for their future endeavors and help them make a bright career in the Food Processing Sector.

About this book

This book is designed for upgrading the knowledge and basic skills to take up the job of 'Food sales Promoter'. All the activities carried out by the Food sales Promoter are covered in this course. Upon successful completion of this course, the candidate will be eligible to work as a Food sales Promoter.

This Participant Handbook is designed to enable training for the specific Qualification Pack (QP). Each National Occupational Standard (NOS) is covered across Unit/s.

Key Learning Objectives for the specific NOS mark the beginning of the Unit/s for that NOS

- FIC/N9701 - Prepare for sale and promotion of food products
- FIC/N9702 - Perform various tasks for selling food products
- FIC/N9703 - Ensure upkeep of food products and related facilities
- FIC/N9901 - Implement health and safety practices at the workplace
- FIC/N9902 - Work Effectively in an Organization
- SGJ/N1702 - Optimize Resource Utilization at the Workplace
- DGT/VSQ/N0101 - Employability Skills

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1. Introduction to the Diligence Program and Overview of the Food Processing Industry

Unit 1.1 Size and scope of the food retail industry

FIC/N9701

Key Learning Objectives

At the end of this module, the trainees will be able to:

1. Explain the size and scope of the food retail industry.
2. To drive future trends and growth.

UNIT 1.1 Size and scope of the food retail industry

Unit Objectives

At the end of this unit, the participant will be able to:

1. Explain the size and scope of the food retail industry.
2. To drive future trends and growth.

1.1.1 Size and scope of the food retail industry

Food and grocery is the largest segment in the Indian retail sector, having an opportunity worth $570 bn and accounting for 66% of the country's total retail spend. Organized food and grocery retail market to reach $60 bn by 2025. The market is expected to grow at a CAGR of 8%, supported by macro drivers such as increasing per capita income, urbanization, and increasing nuclear families. Conversion from unpackaged to packaged, premiumization, and demand for convenience are some of the key drivers at a segment level.

Owing to evolving lifestyles and purchasing habits, an increasing number of consumers are choosing to shop at modern retail stores and stock up on groceries instead of shopping frequently at neighborhood Kiranas. Convenience stores have also started to gain popularity in urban clusters to cater to the increasingly busy lifestyle.

Although conventional categories like Staples and Fresh put together account for ~80% of the total food retail spend, but emerging categories of packaged snacks, confectionery, and beverages are growing rapidly at a compounded rate of 15%. Increasing awareness around health and wellness is set to increasingly shape consumer preferences across categories.

Fig 1.1.1 Food retail industry

1.1.2 Future Trends and Growth Drivers

The demographics of the Indian population are rapidly changing and these are set to drive consumption growth in this decade. By 2030 it is estimated that:

- Per-capita income is estimated to rise from $2,000 currently to around $5,700 in 2030, growing at an 11% CAGR.
- An estimated 600 million people, accounting for 40% of India's population, will live in urban centres, from the current 34%.
- Close to 76% of the households will be nuclear families, which on average consume 20-30% more than joint families.
- Number of affluent and elite households is set more than double to 80 million households, up from the current 36 million.
- More than 40% of all purchases will be highly digitally influenced, up from 20-22% today.

The food retail market is on a tremendous growth trend and the drivers that are set to take this market further can be broadly classified under three pillars:

- Supply Side
- Demand Side
- Regulatory

1. Supply Side

Supply-side features those factors that act majorly as change-driving agents. These include:

- Infrastructure development
- Multi-channel marketing
- Easy credit availability
- Private labelling

The first three listed factors are significant drivers of growth on the supply side. The fourth, i.e, 'Private Labelling' is a relatively recent trend, which is gaining popularity and has enormous potential to drive the market scenario further.

2. Demand Side

The demand side features those factors that are majorly consumer-oriented and are representative of the shifting lifestyles. These include:

- Increasing urbanization
- Increasing disposable income
- Growing middle-class population
- Increasing working women
- Inclination toward healthy lifestyle
- Consumer awareness and changing preferences towards international trends
- Increasing foreign travel
- International TV shows, food festivals and Internet penetration

All these factors majorly hint toward the changing lifestyle of Indian consumers, which translates into the uptake of demand in this industry. These trends will continue to evolve and India is a very fragmented market, the penetration of these patterns deeper into the society will continue to take place, thereby confirming a sustainable growth trend in times to come.

3. Regulatory

The major features on the regulatory front are policy-driven factors initiated primarily by the Government to grow this industry. Two factors under this pillar to have contributed the most are:

- FDI policy in the Multi-Brand Retail sector.
- Implementation of Goods and Services Tax to reform the tax rates and slabs for this industry.

Roles and responsibilities of a Food Sales Promotor:

The food sales promoter is responsible for carrying out the following jobs :

- Organization of food products in designated area in a presentable manner
- Setting up of food exhibition and visual merchandize
- Facilitating the customer during sales
- Maintaining food retail stores
- Promotion of new launches in food with adherence to standard work practices
- Engaging in meaningful interactions and building good relationships with customers
- Distribution of new food product samples and providing feedback for improvement to the management team
- Recording necessary information as required

Scan the QR codes or click on the link to watch the related videos

https://www.youtube.com/watch?v=J-2EiMVNtpM&t=11s

Overview of Food processing industry

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2 – Prepare for sale and promotion of food products

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Unit 2.1 – Introduction to Food Sales and Marketing

Unit 2.2 – Prepare for the sale of food products

Unit 2.3 - Prepare for visual merchandising

FIC/N9701

Key Learning Objectives

At the end of the module, the participant will be able to:

1. Illustrate about Food Sales and Marketing
2. Demonstrate preparation for the sale of food products
3. Demonstrate preparation for visual merchandising

Unit 2.1 Introduction to Food Sales and Marketing

Unit Objectives

At the end of this unit, the participant will be able to:

1. Demonstrate food marketing
2. Prepare for marketing mix
3. Demonstrate the basics of sales process
4. Illustrate the difference between food sales and food marketing

2.1.1 Introduction to Food Marketing

The performance of all business activities involved in the flow of food products and services from the point of initial agricultural production until they are in the hand of consumer.

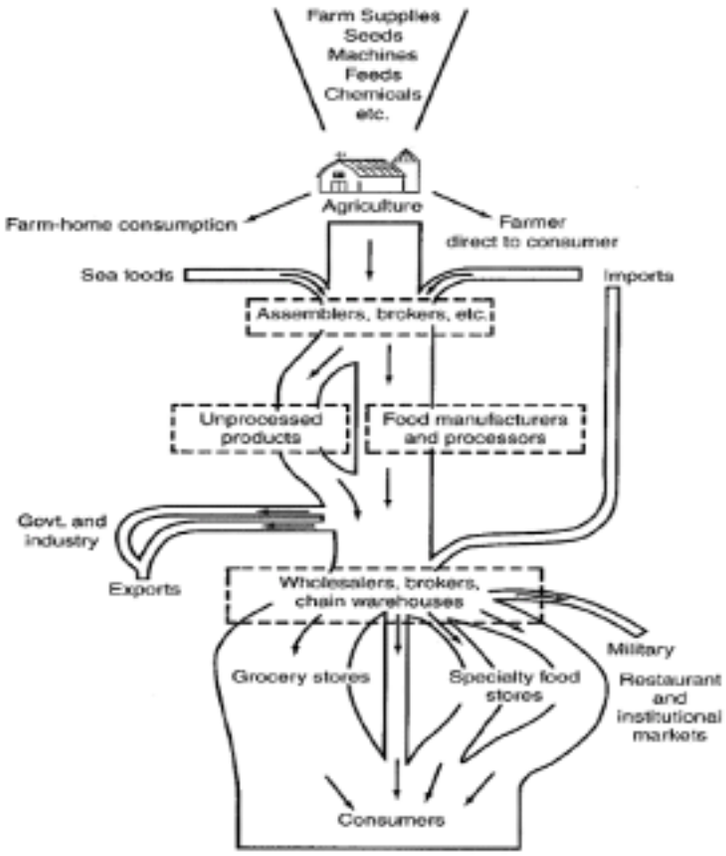

Fig 2.1.1 Food Flow and Marketing

In the marketing of food products, general marketing approaches and techniques are often applied. Food marketing involves a number of other kinds of challenges – including dealing with a perishable product whose quality and availability change as per seasonal conditions. The value chain, the degree to which the involved parties in the marketing channel add value to the product, is particularly important. Nowadays, processing and advanced distribution options such as Kiosks, vending machines, online e-groceries and online retailers provide increasing opportunities available to marketers to provide the consumer with convenience.

2.1.2 Marketing Mix

A marketing mix is holistic marketing. It's a framework to approach the marketing strategy for your products or services.

The original marketing mix was a top-down managerial approach that evolved into the 4 Ps of marketing - product, price, place, and promotion. It's since further evolved into the popular 7 Ps marketing mix, adding people, process, and positioning to the mix.

The 8 Ps definition adds performance to the 7 Ps definition and it has become widely adopted by businesses across all industries because it's simple to understand and apply.

Fig 2.1.2 8 P's of the Marketing Mix

2.1.2.1 Product/ Service

A good product is at the heart of a successful marketing strategy. The product needs to be something that meets the needs and wants of your target market.You need to inform your customers of the features and benefits of your product so they understand why they should buy it. Customers are drawn to products that offer value, meet their needs, and make their lives easier.

2.1.2.2Price

Price is crucial for a successful marketing strategy. You need to find the right price that meets the needs of your target market and allows you to make a profit.If you get it wrong, you could lose customers to your competitors. If you price your product too high, people may be unwilling to buy it. If you price it too low, you may not make a profit.

For example, the pricing strategy of McDonald's has always been to offer food at low prices. This is what has allowed the restaurant to be successful for many years. This also has primarily helped McDonald's build its reputation as one of the top fast-food brands in the world.

However, with the costs of living continuing to rise, McDonald's has begun offering combos and specials in an effort to entice customers and churn out profits through economies of scale.

In India, the brand came up with a punchy line – "AapKeZamane Mein, BaapKeZamaneKeDaam". This was done back in 2008 to attract lower and middle-class customers to experience the offerings of McDonald's India and it worked out very well.

2.1.2.3 Place/Distribution

This refers to finding the right place to sell your product. You need to consider where your target market is and how to reach them. You also need to think about what you're offering. If you're selling a product that needs to be stored in a warehouse, you need to find a place that has the necessary space.

For example –
McDonald's outlets are very evenly spread throughout the cities making them very accessible. Some of these outlets also manage kiosks to sell a limited selection of products, such as sundae and other desserts. Some kiosks are temporary, as in the cases of kiosks used in professional sports competitions and other seasonal events. This element of McDonald's marketing mix also involves the company's mobile apps. These virtual places are where customers can access information about the company's products and buy these products. Drive in and drive through options make McDonald's products further convenient to the consumers.

2.1.2.4 Promotion

Promotion is all about getting the word out about your product. You need to create a marketing mix that includes a variety of promotional tactics such as advertising, public relations, and social media. You also need to think about your target market and what type of messaging will resonate with them. The reason for promoting your product is to make people know about your product and make them interested.

For example, Coca-Cola is one of the most well-known brands in the world and it spends billions of dollars on promotional activities each year.

2.1.2.5 Planning

This is especially important because good planning can help save resources and increase the chances of success. Planning involves setting objectives, developing a strategy, and allocating resources. It's important to have a plan in place before you start promoting your product. This will help you stay on track and make sure that you're utilizing your resources in the most effective way possible.

For example, a small food business might want to plan its marketing activities for the next six months. This would involve setting specific objectives, such as increasing sales by 20% and attracting 100 new customers.

2.1.2.6 Processes

To be successful, businesses need to have efficient processes in place. This includes all aspects of the business from manufacturing to sales and marketing. Processes need to be aligned with the company's objectives and goals. They also need to be efficient so that the company can compete effectively.

For example, a company might have a process for developing new food products. This process would involve researching the needs of the target market, designing a product that meets those needs, and testing the product to make sure it is viable.

2.1.2.7 People

People are an important part of the marketing mix. You need to have a team of people who are responsible for promoting and selling your product. You also need to have people who are responsible for creating and executing the marketing strategy. The team should be able to work together and be aligned with the company's objectives.

For example, a company might have a marketing team that is responsible for creating and executing the marketing plan. The team might also include people who are responsible for advertising, public relations, and social media.

2.1.2.8 Physical Evidence

Physical evidence is anything that can be touched, felt, or seen. It's used to reinforce the messages that are being communicated in the marketing mix.This includes:

- Your premises
- Packaging
- Product design
- Labels

For example, a company might have physical evidence that reinforces its brand image. This could be anything from the company's logo to the design of its packaging.

2.1.3 Food Sales Process

Every food product produced has to be sold. There are a wide range of products being sold in the market. Right from a biscuit to a chicken, everything has to be sold by whichever way. Of all the tools available to a seller, Personal selling is an important tool to sell the products to the consumers.

The sales process includes the five steps to conclude a sale. These are –

Fig 2.1.3 Steps to Conclude a Sale

This process is not a rule of thumb but a better way of handling a sales based on the experiences of various sales person. It is a recommended process. The salespersons can use them in their own way. Each step in the process overlaps the other or may go simultaneously and their sequence can be changed as per the demand of the sales situation by the salesperson. For cheaper products, the process may shorten and for valuable products the whole process may be followed step by step.

2.1.3.1 Prospecting

In order to sell a product, a sales person has to find new customers on a continuous basis. Hence, the first step in the selling process deals with finding prospects who will buy their product. Through prospecting, the salesperson tries to find out the people who need the product and can afford to buy it, that is, they try to create a database of prospective customers also known as Prospects.

Who is a Prospect?

As already explained, Prospects are the "potential customers" (persons who might become your customers). They are the ones who need the product and might buy it. A prospect can be an individual or an institution. For example, atta is required by an individual household also and a bakery and a hotel also. Hence, they are all the prospects for an atta manufacturer/producer.

Characteristics of a good prospect

A prospect can be considered a good prospect only if he possesses certain characteristics. These are:

Fig 2.1.4 Qualities of a Prospect

1. He should feel the need of that product. This can be pre-existing or can be created as well.
2. In some cases, the prospect needs a license or legal capacity to buy the product, for example, a medical prescription is required to buy the medicine, license to buy a gun, and only a major can buy alcohol.
3. He should also have the capability to pay for the product.

Know your customer

In this step of prospecting, the salesperson tries to obtain the database of prospective customers through various sources both internal and external to the organization.

Such sources can be:

- References given by customers
- References from sales managers
- Networking
- Obtaining the database from market research agencies and targeting a particular area like for toffee chocolates one can target schools and for namkeen one can target shop near by liquor shop.

2.1.3.3 Planning the Presentation (Pre-Approach)

The next step is to plan the presentation. Based on the information collected during the customer research, the sales person tries to plan his presentation before meeting the customer. It means planning as to how to make a call. It is a mental exercise. Planning of presentation involves:

- Deciding how to approach the buyer?
- Deciding what questions to be asked?
- Deciding how to present features, benefits and advantages of the product that he thinks will satisfy the customer?
- Deciding how to demonstrate the product (in case the product needs demonstration)

The plan of presentation should be flexible enough to accommodate the situational changes. It is important to note that the salesperson looks impressive and presentable when he first meets the customer as it leaves a lasting effect on the customer. Therefore, when the salesperson meets the customer, he should be well-dressed and should meet the customer with a smile and a warm handshake. These welcome gestures are very important to carry the presentation forward.

2.1.3.4 Handling Customer Objections

During the Presentation, the customer might show some curiosity or raise certain objections in the form of questions. The salesperson should immediately give attention to these objections and try to sort them out.

Raising of objections or doubts is a positive sign indicating that the customer is showing interest in the presentation/product.

How to handle the objections:
The salesman should handle the objections very carefully and should do the following:

- He should listen to the customer very carefully and patiently.
- Respect the views of the customers and try to make his point clear.
- Give clarifications for the doubts raised and respond specifically to the objections.
- The salesperson should make sure that the customer is fully satisfied as far as his objections are concerned.

Types of objections:
Objections related to high price: While buying a product if a customer says that “the product does not fall in my budget” or “it is very expensive”; it indicates that the customer thinks that the cost of the product is too much and he cannot spend so much on buying that product.

Handling the objection: The salesperson can try to convince the buyer by telling the customer the importance of the product and how valuable would it be for him. If still the customer is not convinced, then he can offer some other alternative which is of lesser value and suits his pocket.

Objections related to the Product or Service:In this case, the customer is of the view that the product will not be able to solve his (customer's) problem. He doubts the capability of the product or service in solving his problem. Even if the salesperson tries to convince him about the capability of the product, the customer is not ready to believe his words.

Handling the objection: Here the salesperson has to assure the customer about the quality, features and performance of the product and will also have to convince him by showing positive reviews of the existing customers or by giving him other proofs.

Objections related to Procrastinating (by giving lame excuses): When the customer is not in a mood to buy a product, he might raise objections by giving lame excuses for not buying the product or for postponing the purchase. For example, he might say, "I will have to ask my elders before buying" or "I will come later" or "I am not having sufficient money to buy the product" or "I want to survey more before I make my decision". Here, the main intention of the customer is to delay the purchase.

Handling the Objection: The salesperson should understand that some people take time to decide and cannot take immediate decision to buy a product. The only way to handle this kind of objection is to ask for a future commitment to buy from the customer. As far as possible, the salesperson should try to fix up a meeting in some future date in order to move the sale forward.

Concealed Objections: Sometimes it happens that the objection that the customer raises is not the correct one. There is something else that is bothering him. This is the case of hidden or concealed objections. For example, the price of the product may be bothering the customer but he may say that the size of the product is not suitable to him. Such type of cases are a little tricky and the salesperson needs to handle these very carefully and tactfully and try to find out the real reason behind not buying.

Handling the Objection: These type of objections can be best handled by asking various questions to the customer and make him talk a lot so that he speaks out the real reason behind not buying. The other way is that the salesperson can straight away ask the customer to tell him the real reason so that he can help him in finding a better solution to his problem.

2.1.3.5 Closing the Sale

After the objections have been dealt with, its time to close the sale or strike a deal. Closing of the sale will depend on the type of product being sold. In case of non-technical products, the sale has to be closed immediately after the presentation or meeting; while for the complex and technical products, the process of closing the sale is lengthy and takes a few calls before finally closing.

- In case of non-technical products: In case of a simple sale (non-durable and less expensive products like daily provisions, milk, bread etc.), the salesperson should try to sell the product in the first and the only call or else the sale is lost.

- In case of technical products: But in the case of technical products (products that are costly and high involvement products), the sale may take some time to complete and is not completed in one call or meeting. In that case, the salesperson should try to gain commitment. It can be done in two ways:

i. Fix up another meeting
ii. Ask for a commitment

The basic purpose is to move the sale forward, otherwise it can be lost.

2.1.4 Food Sales Vs Food Marketing

Sales is when you're face-to-face with a customer, convincing a person to buy your product. Food sales means establishments or places of business primarily engaged in the retail sale of food or household products for home consumption. Typical uses include groceries, delicatessens, meat markets, retail bakeries, and candy shops.

Marketing is the collection of decisions you make about the market that leads to successful sales. Marketing is the planning part of sales. Food marketing is defined as a series of marketing events that take place between a food company and a consumer. Food marketing is advertising that promotes the sale of certain food or food products. It takes many forms and can involve building relationships with customers, raising brand awareness, developing new products, promoting them through advertising, and even paying grocery stores for prominent shelf space, all with the goal of promoting sales.

Increased marketing activity can create the perception of greater sales coverage. Marketing can identify shifts in buying behavior.

Let's consider the example of McDonalds and Burger King
McDonalds sells food. They target families with kids, to get the whole family to come eat. They offer Happy Meals and play areas. Their locations are chosen for convenience. They distinguish themselves based on consistency of menu and food. One can walk into any McDonalds anywhere and know the Alloo Tikki tastes pretty much the same. They advertise using Ronald McDonald. All those decisions are marketing decisions.

Burger King competes with McDonalds and also sells food that's the same everywhere, with locations chosen for convenience. They also target families with kids, use cartoon characters in their ads, and have a consistent menu. So other than the food, how do we tell them apart? Burger King positions themselves as different from McDonalds by letting you eat according to your individual taste. While McDonald's says, “eat here and you always get the same thing,” Burger King says “have it your way.” That positioning is a marketing decision. Of course, the irony is that even if you have it your way, “your way” is chosen from a menu as limited as McDonalds. The difference is in the marketing message, not in the product itself.

Once the marketing decisions are made, sales people take those decisions and march into the world to sell the products and services, using the messages marketing chooses. With thisfast food example, sales happens at the counter. The person taking your order might suggest a specific item. They don't make any of the marketing decisions, but they are given a menu and they help you choose specific items. Like any good salespeople, they try to get you to buy more by asking, “would you like fries with that or something to drink?”

Exercise

1. Value chain is involved from the initial reception of materials all the way through its delivery to market, and everything in between is not part of it. (T/F)

2. The four Ps of marketing—product, price, place, promotion—are often referred to as the marketing mix. (T/F)

3. Which one of the following elements is not part of marketing mix strategy?
a) Services
b) Distribution
c) Purpose
d) Price

4. _____ deals with the specification of the actual good or service and how it relates to target customer.
a) Price aspect
b) Product aspect
c) Promotion aspect
d) Place aspect

5. When business sells products to customers without any intermediary through retail stores, markets, the internet, and door to door sales, it is called _____.
a) Direct distribution
b) Merchandising
c) Indirect distribution
d) Straight marketing

6. _____ is short-term incentives to encourage purchase or sales of a product or service.
a) Advertising
b) Sales promotion
c) Online advertising
d) Public relations

7. The personal presentation by the firm's sales force for the purpose of making sales and building customer relationships is called:
a) Personal selling.
b) Public relations.
c) Direct marketing.
d) Sales promotion.

8. Prospecting is the step in the selling process in which the sales person _____.
a) meets the customer for the first time
b) identifies qualified potential customers
c) tells the product's "value story" to the customer
d) clarifies and overcomes customer objections to buying

9. The type of objections when customer raise issue and some other issue is bothering customer is called _____

a) Objections related to Procrastination
b) Concealed objections
c) Objection related to services
d) Objection related to high price

10. Which of the following statements about handling objections is most likely INCORRECT?

a) Objections can occur at any time during a sales presentation.
b) A skillful salesperson can handle every objection and make a sale.
c) Sometimes prospects appear to be making objections when they are actually asking for information.
d) Use positive body language as part of how you respond to an objection.

Unit 2.2 – Prepare for the Sale of Food Products

Unit Objectives

At the end of this unit, the participant will be able to:

1. Identify roles and responsibilities of Food Sales Promoter
2. Describe receiving and stocking
3. State the importance of packaging and labelling the food products
4. Identify the process of food storage and handling
5. Illustrate stock rotation

2.2.1 Introduction to Food Sales Promoter

Food Sales Promoters demonstrate and provide information on products or services for various brands and/or companies. Their duties involve selling various food products in a retail environment. They are also responsible for implementation of product promotion campaigns.

2.2.1.1 Duties of a Food Sales Promoter

- Attracting new customers at the store.
- Listening to what customers want and help them to find the perfect product that satisfies their needs.
- Constantly building product knowledge and delivering this knowledge in engaging ways like product knowledge training, Product Demonstrations, Infographics etc.
- Setup special booths, promotional stands, and stock products.
- Representing the company in sales events, promotions, and work along with the marketing team for increased exposure.
- Expand the brand visibility and work towards its increased advertising and popularity.
- Preparing sample food items for the customer and providing feedback for improvement to the management team.
- Engaging in meaningful interactions and building good relationships with customers.
- Procuring the required quantity of food products from stores, warehouses, etc. as per supervisor's instructions
- Recording transactions and stock levels.
- Processing customers' payments.
- Staying up to date with product or service features.

2.2.1.2 Qualities Required for a Food Sales Promoter

To succeed in a career as a food sales promoter, one need to have the following qualities:

- An outgoing personality
- Must be patient
- A willingness to talk to people and develop relationships,
- Excellent interpersonal skills
- Pay attention to details and possess a sense of responsibility for own work

Individual also needs to project enthusiasm for the event, product, or service you are promoting.

2.2.2 Receiving and Stocking

- Following is the process to properly prepare for, receiving and handling an incoming food product delivery.
- Prepare the warehouse/store room: To organize the ware house, throw the trash out, stack empty boxes, and condense merchandise to make room for the load.
- A place for everything, and everything in its place: The maps can be created for the refrigerator space to find out where the coldest (usually near the fan) and warmest (usually near the door) spots are located to help you store the food at the right temperature for the best flavor and the least spoilage. Keep items in the same place each day so you can quickly find needed product. When unloading the food items, try to park items in set areas to minimize handling them multiple times.
- Know the temperature zones: When picking up or receiving a food product delivery, accept only those items that are within their recommended temperature ranges. Otherwise, they may not last as long in storage or on display.
- Maintain the “cold chain” to keep the product cold as per their requirement. Warm items, such as bananas, should be stacked outside the cooler. Packaged salads lose a day's shelf life for every hour kept out of refrigeration. Bananas and pineapples sustain chill damage easily, and stone fruit (peaches, plums, and nectarines) has “kill zones” if kept too cold or too warm. Basic knowledge about storage will help minimize waste and maximize profits.
- Handle with care! Never throw or drop food products: This can cause damage and shrink (i.e., loss of moisture in the product). Be careful not to subject fragile items, such as berries or mushrooms, to crushing. Dropping a box of apples as little as three inches can drastically decrease their shelf life and increase waste. Inspect items as you put them away for signs of damage. If you see a food item that you would not buy, neither will your customers!
- Rotate items using the First-In-First-Out (FIFO) method: Place newer items below or behind older items so that you can be sure to rotate all of the inventory out onto the sales floor before it goes bad. When stacking cases, make sure the printing on the outside of boxes is visible so you know what is being stacked where. This will help in stock rotation and save valuable time.
- Dating keeps track of aged inventory: Cartons have a way of overstaying their welcome, so by marking cases with a received-on date (either with a marking pen or price gun) you can see at a glance which items must be moved first.
- Check the load you just put away: Did everything arrive as ordered, compared to the invoice? This is the time to note outages or shorts and make adjustments with the supplier or supervisor.
- When a load is put away, step into the cooler and dry storage area and ask these questions:
- Is everything accessible? Can I quickly tell which apple varieties are which? Which shelf holds chilies? Which shelf has cabbage?
- Are the items in the cooler rotated and dated?
- Are sensitive items protected (i.e. nothing heavy crushing boxes of grapes, mushrooms aren't being dried out by the fan, are the banana lids off to slow ripening)?
- Finally, is the storage area safe? Free from excess water or debris, and well lit?

2.2.2.1 Mapping the Storage

There is a lot to remember when it comes to storing food items. One way to keep track of it by making a storage map for the refrigeration and dry storage areas.

The diagram below is an example of how one might map out his or her storage space to prepare for new produce items.

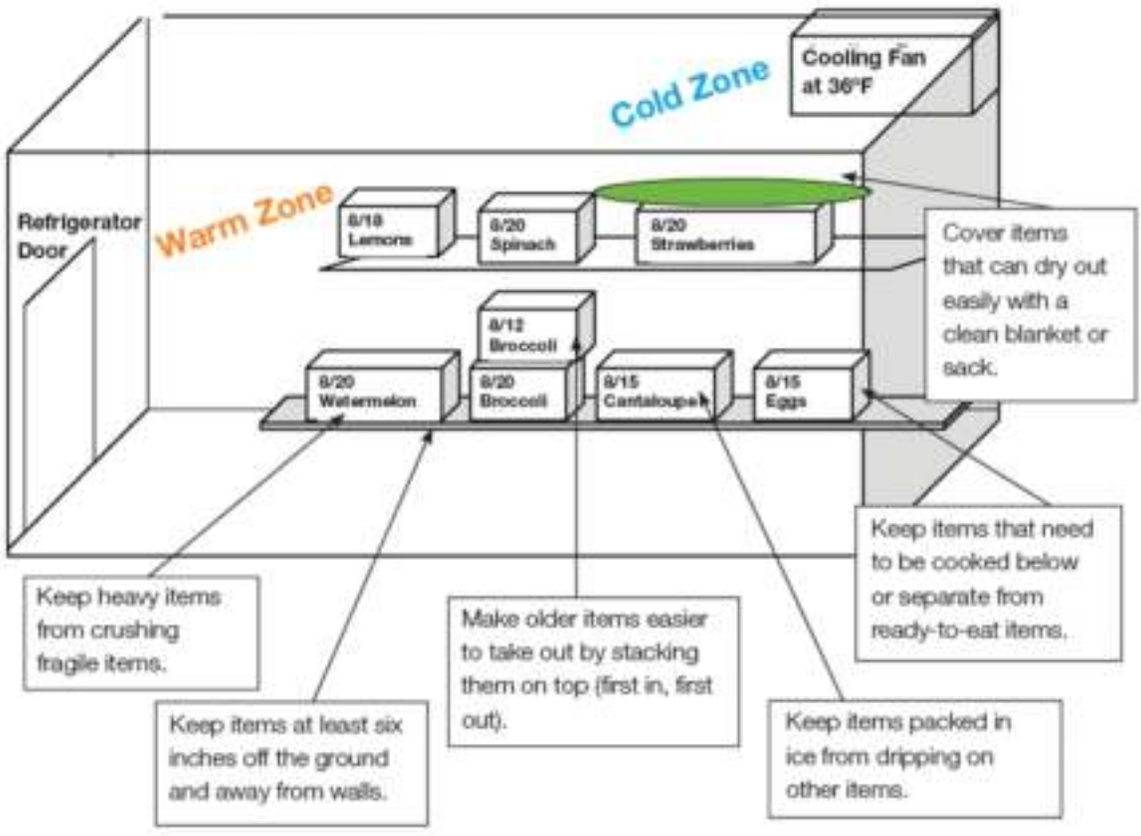

Fig 2.2.1 Map out storage space to prepare for new produce items

2.2.3 Food Packaging and Labelling

Packaging is the science, art, and technology for protecting the product to prepare it for distribution, storage, sale, and use**.** It also refers to processes involved in the design, evaluation, and production of packages. A coordinated system of preparing goods for transport, warehousing, logistics, sale, and end-use is the packaging. The packaging contains, protects, preserves, transports, informs and sells. There are many countries where the Internet is integrated into government, business, and institutional, industrial, and personal use.

Package labelling or **labelling** is any written, electronic, or graphic communications on the packaging or on a separate but associated label. All food products sold in India that are prepackaged are required to comply with the Food Safety and Standards (Packaging and labelling) Regulations, 2011.

General Labelling Requirements

The following labelling requirements must be complied with by all prepackaged food sold in India:

- The label must be in English or Hindi or Devnagri language. In addition to the above, the label can contain information in any other language, as required.
- The label must not contain information about the food that could be deemed to be false, misleading, deceptive or otherwise create an erroneous impression regarding the product.
- The label must be affixed to the container in such a manner that it would not easily be separated from the container.
- The contents or information presented in the label should be clear, prominent, indelible and readily legible by the consumer.
- If the container is covered by a wrapper, then the wrapper must contain necessary information or make the label of the product inside readily legible by not obscuring.
- The name of the food must be mentioned along with the trade name and description of the food contained. In case the food contains more than one ingredient, then a list of ingredients must be presented in descending order of their composition by weight or volume, as the case may be, at the time of its manufacture.

The purposes of packaging and labeling

Packaging and labeling have several objectives

- **Physical protection** - The items enclosed in the package need to be protected from shock, vibration, compression, temperature, etc.
- **Barrier protection** - Many times a barrier is needed to protect from oxygen, water vapor, dust, etc. Permeation is a critical aspect of design. Cleaning, keeping fresh, keeping sterile, and keeping the contents safe during the intended shelf life are primary functions.
- **Containment or agglomeration** - Small objects are typically grouped together in one package to maximize efficiency.
- **Information transmission**–Labels and packaging tell you how to handle, transport, recycle, and dispose of the product or package. Packages and labels are sometimes used for tracking and tracing purposes as well. For instance, bar code present on the label can be used to trace the product
- **Marketing** - The packaging and label can be used by marketers to encourage customers to purchase the product. Throughout the decades, graphic and physical design have been important and continuously evolving phenomena. Package design and graphic design are very essential for the package presentation and (in many cases) the point of sale display.
- **Security** –The packaging of food products shipment can play an important role in reducing the security risks. A packages can be made with improved tamper-resistance packaging to deter tampering and also can include tamper-evident features to detect tampering. Some packages may be authenticated with authentication seals and use security printing that indicates the contents are counterfeit.

Fig 2.2.2 Packaging of food

2.2.3 Food Packaging and Labelling

Convenience - Packages can have features that add convenience in distribution, handling, stacking, display, sale, opening, reclosing, use, dispensing, and reuse.

Portion control - A single serving or single dosage packaging has a specific amount of contents to control use. Commodities in bulk (such as salt) can be divided into packages that are more suitable for individual households. It also allows for inventory control: selling sealed one-liter bottles of milk rather than requiring people to bring their own bottles.

Symbols used on packages and labels

Many types of symbols for package labeling are nationally and internationally standardized. For consumer packaging, symbols exist for product certifications, trademarks, proof of purchase, etc. Some requirements and symbols exist to communicate aspects of consumer use and safety. Examples of environmental and recycling symbols include: Recycling symbol, Resin identification code (below), and Green and Red Dot (symbol).

Fig 2.2.3 Recycling Symbol

Fig 2.2.4 Resin identification code

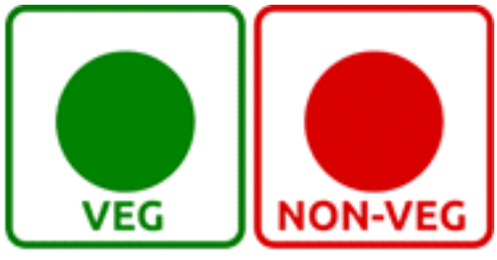

Fig 2.2.5 Green and Red Dot

Bar codes (below), Universal Product Codes, and Radio-frequency identification (RFID) labels are common to allow automated information management in logistics and retailing. Country of Origin Labelling is often usedto notify customers with information regarding the source of certain foods.

Fig 2.2.6 Bar code printed

2.2.3.1 Food Labelling

Grocery store aisles are avenues to greater nutritional knowledge. With food labels, consumers get the following information:

- Nutritional information of the packaged food.
- Distinctive, easy-to-read formats that enable consumers to more quickly find the information to make healthful food choices.
- Information about saturated fats, cholesterol, fiber and other health-promoting nutrients
- Nutrient reference values expressed as % Daily values that help consumers see how a food fits into an overall daily diet.
- Uniform definition for terms that describe a food's nutrient content – such as -light-low fat and high fibre to ensure that such terms mean the same for any product on which they appear.
- Claims about the relationship between a nutrient or food and diseases or health-related condition such as calcium & osteoporosis, and fat & cancer. These are helpful for people who are concerned about eating foods that may help keep them healthier.
- Standardized serving sizes that makes nutritional comparison of similar products easier.
- Declaration of total percentage of main ingredient for example declaring percentage of fruit present in fruit drinks to enable consumers to know its quantity.

NUTRITION INFORMATION*

	Typical value for 40 g	40 g serving with 200 ml of cow's milk	
Energy	153 kcal	300 kcal	
Energy from Fat	23 kcal	104 kcal	
Total Fat	2.6 g	11.6 g	
Saturated Fatty Acids	0.3 g		
Monounsaturated Fatty Acids	1.3 g		
Polyunsaturated Fatty Acids	0.7 g		
Trans Fatty Acids	0 g		
Cholesterol	0 mg		
Total Carbohydrates	30.1 g	40.0 g	
of which Sugar (Sucrose)	3.5 g	3.5 g	
of which Dietary Fibre	2.4 g	2.4 g	
Protein	3.5 g	10.0 g	
Sodium	0.04 g	0.10 g	
			(%RDA)
Vitamin C	10.0 mg	14.0 mg	35%
Thiamine (Vit B1)	0.3 mg	0.4 mg	36%
Riboflavin (Vit B2)	0.4 mg	0.6 mg	52%
Niacin (Vit B3)	4.0 mg	4.2 mg	35%
Vitamin B6	0.5 mg	0.6 mg	29%
Vitamin B12	0.1 µg	0.4 µg	36%
Folate	25.2 µg	59.3 µg	20%
Iron	5.6 mg	5.9 mg	28%

*Approximate values

Values in the Nutrition Information Panel are based on composition of individual components, may vary due to the heterogeneous mix of the components in random samples.

Milk nutrient values from Indian Food Composition Tables, NIN, ICMR, 2017 except for Vitamin B12 (Source: Nutritive Value of Indian Foods, NIN, ICMR)

% RDA (Recommended Dietary Allowance) per day for sedentary women basis Nutrient Requirements & RDA for Indians by ICMR, 2010

Fig 2.2.7 Nutrition Information

2.2.4 Food Storage and Handling

Stock controlling is very essential since it ensures that foods are not kept beyond their shelf life and that they are safe to consume. When food is left for too long and in unfavorable conditions, bacteria can multiply. Even tinned or frozen foods have a shelf life and can deteriorate overtime if left in the refrigerator for too long. Foods stored in unfavorable conditions for too long can become more contaminated as a result of contact with food handlers or pests.

In terms of stock control, there are two main hazards:

- Microbiological Contamination – Keeping food in the wrong place or handling it incorrectly can result in microbiological contamination.
- Physical Contamination – Using incorrect transport, storage, and food handling techniques may lead to stock becoming physically contaminated.

In order to ensure the safety of stock control, one may implement controls. These include:

Delivery

- In cases of damaged containers, foods should not be accepted as this could indicate contamination.
- Foods that have passed their "use by" date should not be accepted.
- You can also reject delivered foods that are beyond their 'best before' date as the product is not in its most ideal state.

Storage and Labelling

- Do not sell/use food that has passed its 'use by' and 'best before' date.
- Food prepared or cooked on the premises and then stored should be labelled with an appropriate "use by" date.

Stock Rotation

- Food stock should be rotated on a 'first-in-first- out' basis.
- All damaged foods should be removed from display and storage areas.
- Ensure that all existing foods are used first prior to using new stock.

Try to get into the habit of conducting regular inspections of the stock to ensure all foods are still in date. If there is damaged or contaminated stock, mark the items for disposal and keep them separated from other stock.

Note: There is a difference between 'best before' and 'use by' dates.

Best before' date – A best before date on a food package states when the durable life period of the food ends. Durable life means “the anticipated amount of time that an unopened food product, when stored under appropriate conditions, will retain its freshness, taste, and nutritional value.” This date can be found on a package underneath the words “best before”

2.2.5 Stock Rotation

Stock rotation is the process of organizing inventory to mitigate stock loss caused by expiration or obsolescence. Basic stock rotation entails moving products with impending sell-by dates to the front of the shelf and moving products with later expiration dates to the back.

How to implement stock rotation at your premises?
You should ensure that all staff are aware of the importance of stock rotation and understand how your stock rotation system works. The following steps are essential to implement a solid food stock rotation:

- Checking the date on food when it is delivered, used, or displayed
- Displaying or storing food with a short shelf life at the front of the shelf
- Keeping or displaying food with a longer shelf life at the back
- Always using food in the correct order
- Checking that food is in good condition before using it
- Removing out-of-date stock from storage and displays

2.2.5.1 The Methods

1. FIFO

The first in, first-out (FIFO) method of stock control is preferred by most retailers, especially in the food and beverage industry. The new stock is put in the back, to sell the older stock first. While this may seem like a no-brainer and saves retailers thousands of dollars in lost product, not every store takes the time to do it.

Fig 2.2.8 FIFO

2. FEFO

First expired, first out (FEFO) takes into account that what retailers receive from the warehouse may not necessarily be the freshest product. Instead of defaulting to putting the newest incoming stock in the back, the expiration dates are checked. The freshest product goes in back and the oldest product goes in front. This technique takes more time to execute but is worth it for perishable products with short-term shelf lives. If any accidental mixing has occurred, either by an associate or a customer, FEFO also helps catch it.

For example, when products enter the store, instead of putting them at the back of your shelf,you'd first check the expiry dates. You then place those products with the shortest shelf-life near to the front of your shelf, if not at the front, so customers see them and buy them first.

3. LIFO
Last in, first out (LIFO) is a method used to account for inventory that records the most recently produced items as sold first. Under LIFO, the cost of the most recent products purchased (or produced) are the first to be expensed. Using LIFO typically lowers net income but is tax advantageous when prices are rising.

2.2.6 Reporting Stock Discrepancies

An inventory discrepancy happens when the actual on-hand inventory stock is different from the item quantity recorded in an inventory system.

Discrepancies are not uncommon in business, and they can have a substantial negative impact.

- An Undiscovered stock discrepancy can result in lost sales, excessive inventory and poor customer service.

Frequent causes of inventory discrepancy
The possible reasons for the discrepancy between physical stock and the stock shown in records may be due to the following:

- There is a shortage of material due to spoilage, evaporation, wastage in material handling, and storage breakdowns. Weight gain due to absorption of water, etc.
- Items of material were placed in the wrong location.
- Thieving and pilfering by insiders and outsiders from stores.
- Issue and receipt of stock without proper recording and maintenance of stores recording and accounting.
- Stock returns are not recorded properly.
- Arithmetical errors in calculating the balances in the bin card.
- Clerical errors in stores ledger.
- The supplier supplies a different quantity of material than is mentioned in the delivery challan.
- Discrepancy due to improper weighing of material.

Report accurately on stock inventories
Reporting on stock inventories is the final step in the efficient stock control process. Doing so to a high level of accuracy is important for teams across retail operations and provides a point of reference for questions of business strength and sustainability.

Detailed information on the following as required:

- Stock receipts
- Stock dispatches
- Stock returns due to damage, incorrect orders, etc.
- Stock take & related discrepancies
- Stock loss due to shrinkage
- Stock loss due to damage
- Stock turn (related to buying / merchandising)
- Cost of freight & transport
- Cost of storage and space requirements

Exercise

1. An inventory discrepancy happens when the actual on-hand inventory stock is different from the item quantity recorded in an inventory system. (T/F)

2. In First expired, first out (FEFO) method, when new stock comes in, it gets put in the back, pushing the older stock forward to be sold first. (T/F)

3. Which one of the following is not a duty of food sales promoter?
a) Attract new customers at the store.
b) Keep customer waiting
c) Setup special booths, promotional stands
d) Expand the brand visibility

4. To become a successful food sales promoter, one need to have all of the following qualities, Except:
a) An outgoing personality
b) Must be impatient
c) A willingness to talk to people and develop relationships,
d) Excellent interpersonal skills

5. _____ a critical factor in design. Keeping the contents clean, fresh, and safe for the intended shelf life is a primary function.
a) Desiccants
b) Permeation
c) Convenience
d) Taste

6. Which of the given reasons, is NOT a valid reason for packaging of food items?
a) Security and portion control
b) Marketing and convenience
c) Protection and information transmission
d) None of the mentioned

7. In terms of stock control, which of the following is a main hazards?
a) Microbiological contamination
b) Biomedical contamination
c) Favourable contamination
d) Delivery contamination

8. Statement 1: 'Use by' date is mentioned for perishable items and 'Best before' date is used to indicate when the item starts decaying/getting spoilt.
Statement 2: Instruction of use need not be necessary unless it is not obvious how to be used.
a) True, False
b) True, True
c) False, False
d) False, True

9. What does FIFO mean in stock rotation mean?

_____
_____
_____
_____
_____
_____
_____

10. Mention a few frequent causes of stock discrepancies.

_____
_____
_____
_____
_____
_____
_____

Unit 2.3 – Prepare for Visual Merchandising

Unit Objectives

At the end of this unit, the participant will be able to:

- Define visual merchandising, its components and principles
- Identify the purpose, content and style of the display
- Identify the equipment, materials, merchandise and props for visual merchandising.
- Maintain stock records to account for merchandise on display

2.3.1.1 Advantages of visual merchandising

The potential advantages of good visual merchandising include:

- **Increased customers** - Visual merchandising can increase the amount of customers who notice and enter the food store. Merchandising should start outside where customers first see the premises (e.g. signage). If they like what they see and enjoy the experience onecreate inside, this should encourage them to return to the store.
- **Increased sales** - Effectively merchandising food products can influence their sales significantly. The use of clear pricing, well-stocked shelves, simple displays, and prominent sale signs can drive profits while improving customer satisfaction.
- **Maximising the potential of thestore space** - A creative approach to merchandising can help you to get more out of the space without the need for expansion or renovations. The layout should flow easily and direct customers to important items and displays you want to highlight. The customers will begin to associate your clear and attractive merchandising with a positive shopping experience. This should encourage them to return.
- **Getting the most value out of products** - If you have products that are difficult to sell, clever visual merchandising could help you to market them without having to reduce their price. Similarly, you can place low-priced items in less prominent spots to encourage the sale of high-margin items.

2.3.1.2 Visual Merchandising Plan

Before you embark on a new display or store layout, have a plan in mind. Below is a 4-step plan, planning will ensure your displays have a purpose and consideration, maximising selling opportunities.

The "PLAN"
P – Purpose, central to any display is —What do you want the customer to do?
This may sound obvious – Buy something But it isn't.
Buy what? The bulk offer, the three for two, the meal deal.

L – Location. A space 10cm to the left can have double digit impact on sales and profit. Supermarkets use Planogram software to maximise this. We have primary, secondary and discovery aspects to a display – primary being the most visible. Band your display area, and ensure you focus your headline in the primary area.

A – Attention. Your display will compete with 2-3,000 other promotional campaigns we get exposed to on a daily basis. Why will this grab my attention more than the others? Movement, light, space, scale – all make your display catch the customer's eye.

N – Numbers. You must do the numbers to understand what constitutes success. You don't have to be an accountant to understand what works and what doesn't. As busy people we need to make sure we focus only on what works.

2.3.1.3 Visual Effects of Displays

A store displays products according to specific visual design brief, which must be clear, effective, and designed as per the requirement of the individual store.

A visual design brief includes information as given below:

- Pattern of Displaying Products
- Display Budget
- Specific Expectations and Objectives of the store
- Type of Graphics Required
- Target Audience

2.3.2 Principles of Visual Merchandising

- Make it easier for the customer to find the desired category and merchandise
- Make it easier to self-select
- Make it possible to coordinate and accessorize
- Educate about the product in an effective and creative way
- Make proper arrangements in such a way to increase the sale of unsought goods

2.3.2.1 Fixtures and Merchandise Presentation Methods

There are 4 key elements of visual merchandising. They are:

1. Store Front
2. Store layout
3. Store interior
4. Interior display

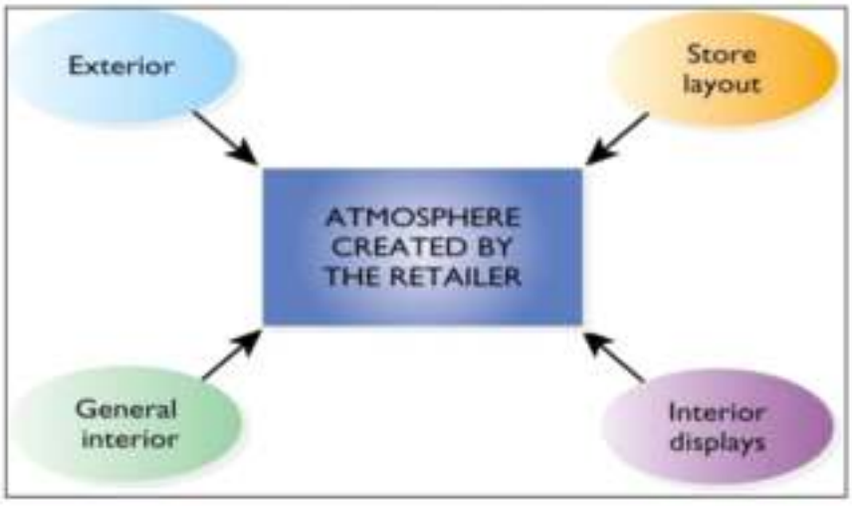

Fig 2.3.1 Key elements of visual merchandising

1. Store Front: It includes the exterior of the business. It consists of:

- Signs
- Marquees: it is an architectural canopy that extends over the entrance.
- Entrance: it should be such that it should provide customer convenience as well as store security. Small stores may have one entrance. Big stores consists one for entrance and other for exit. There are different types of entrances being used now days like revolving, push-pull, electronic entrances.
- Window display: it is an important element. It creates the store's first impression with customer. It begins the selling process even before the customer enters into the store. According to the convenience of store, different types of window displays like closed, open-back, angled, arcade, cornered window display etc. are used.

2. Store layout: Refers to the ways that stores use floor space to facilitate and promote sales and serve customer.

- Selling space – assigned for interior displays, transactions
- Merchandising space - Allocated to items that are kept in inventory for selling - Selling floor, Stock room area
- Customer space - assigned for the comfort and convenience of the customer (food court, dressing rooms, lounges, area for children)
- Personnel space – assigned to store employees for lockers, lunch breaks, and restrooms

3. Store interior: It deals with the way of designing the store's interior. It affects the store's image. It includes the Floor and wall coverings, lighting, colors and fixtures. It is important to create a comfortable

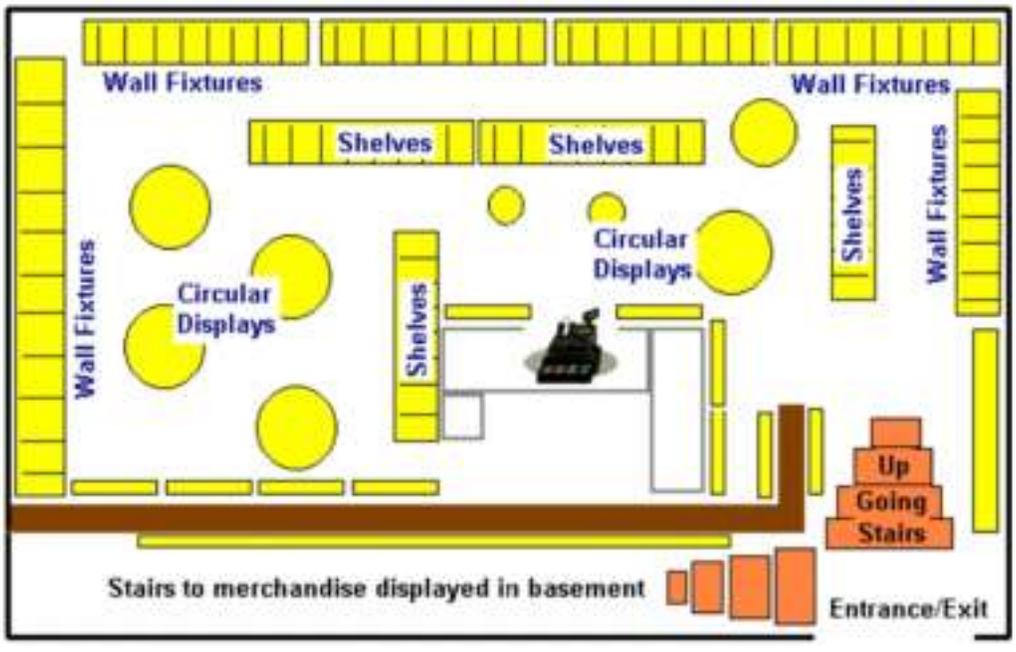

Fig 2.3.2 Store layout

environment inside such that customers feel relax and free to spend more time and shop. It should be designed such that they should not be confused, pressed with crowds or long lines.

Fig 2.3.3 Store interior

4. Interior display: It is the way of displaying the store's merchandise in interior of the store. They are the general part of the store. They generate 1 out of 4 sales. They enable the customer to self-select without personnel. It may be of closed display, open display, point-of-purchase, store decoration or architectural display. Interior display use fixture and props to hold the merchandise. In addition to the above elements there are other elements that help in a successful visual merchandising. They are:

- **Lighting:**

Visual merchandising will be successful with proper lighting. If there is no correct lighting it doesn't fetches any attention from the customers. Rather than if there is poor lighting, which make customer strained, will damage the store's image. So lighting is an important element.Usually 500 -750 lux lighting level is recommended for the retail stores and supermarkets.

Fig 2.3.4 Store Lighting

- Lighting draws the attention of customer. A shopper's eye is automatically drawn to the brightest part of the store. It should illuminate or reflect properly. It should not cause any strain to customer. There are 3 types of lighting: Primary lighting: it illuminates the overall level of the store. Accent lighting: it is illuminated on special areas to drag customer's attention Atmosphere lighting: it gives a distinctive and specific illumination without shadow.
- Colour: It is one of the most important elements of visual merchandising. Proper selection of colours is essential to drag the customer's attention. There should not be zigzag or crowdie colours which confuses and strains him. Coloureffects psychological emotion of the customer. They can change the emotions of human being. They can crate positive or negative effect on mind. Hence proper selection of colours which creates a positive effect on customers is used.
- For instance, a candy store could use a red window display with product samples set around waist level to attract the attention of children.Also,in areas saturated with certain colors, the use of contrasting colors can draw attention. If many of the stores in one part of a mall have brightly colored displays, a store with dark displays could be more effective at attracting attention by creating a stark contrast that gives consumers a break from the bright colors.

2.3.3 Components of Visual Merchandising

2.3.3.1 Retail Signages

Signages are one of the integral components of visual merchandising executed at any retail store. It can be a drop down from the ceiling of the store or it can be an A-4 or A-3 size paper pasted on the store shelves promoting schemes like 'Buy One Get One Free'.

Fig 2.3.5 Retail Signages

Signs are considered one of the most appropriate ways of conveying messages to customers, whatever the case may be.

Effects of Indoor Signages

Retail signages were of various types such as:

Fig 2.3.6 Standee

Fig 2.3.7 Wobblers

Fig 2.3.8 Drop – Downs

Fig 2.3.9 Shelf Stock Signage

Fig 2.3.10 Wall/Pillar Paintings

Fig 2.3.11 A-4/ A-3 Signage

An important purpose of the application of these signages is to inform the client about the various product categories available in the store and aid him in making a purchase. The success of these signages solely depends on their ability to attract the customer's attention without creating any ambiguity in his mind. Therefore, to increase sales volume, it is necessary to identify what type of signage has the greatest effect on customer buying behavior at the store.

The indoor signages can be used to promote offers and schemes on different products, such as 'Buy One Get One Free', price discounts on a particular product, price comparisons between store price and MRP, seasonal and festival promotions, etc.

It is important to identify messages conveyed through these signages, as referred to by the visiting customer. The figure below highlights customer's preference for messages communicated by these indoor signages. It has been observed that out of all types of messages communicated by signages, discounts were the ones for which customers had a preference to look at, followed by the price comparison and branding, with almost similar kinds of scores.

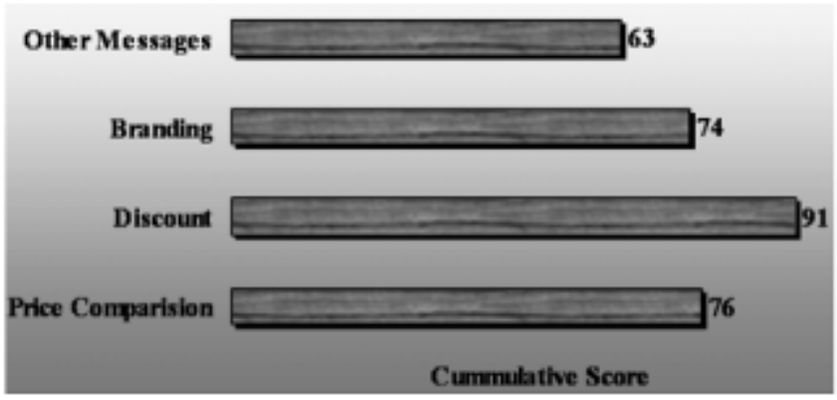

Fig 2.3.12 Customer preference for message communicated by signages

2.3.3.2 Retail Planogram

A retail planogram illustrates where and how products should be displayed on shelves to increase sales. A skilled planogrammer at a retail store develops these planograms for various types of visual merchandising displays (such as shelf displays, pegboards, and slat boards). Based on the information available for the product such as the quantity of inventory left for the product, the volume of sales per square foot of retail space, and other information (such as stock-keeping unit numbers, product codes, etc.), these are developed.

A planogrammer estimates how many 'Facings' (how many of the products should face directly toward the customer) a certain product should have on a retail display, as well as how high or low it should be, and which products should surround it.

This planogram is then printed out as a visual to be followed by the part time helper that is often hired to restock retail shelves and displays. This gives management of a retail store or chain more control over how products are displayed, and allows them to track and improve on the success of their planograms. This component is taken care well at the Food Bazaar as there were separate sections for all categories of products without any intermingling of products.

2.3.3.3 Retail Merchandising

Retail merchandising is a major component of visual merchandising.Almost everything a customer sees in a storefront is considered, which includes an attractive, inviting entrance to the store, the height of the building, display windows, signage, parking space, etc. until he/she leaves the store with a purchase in hand. It is about understanding how customers shop so that products can be placed at positions that increase visibility and appearance with the aid of flood lights, PAR bulbs, and other appropriate fixtures.

2.3.4 Identify the Purpose, Content and Style of the Display

1. Do you know what you are focusing on with your display?
2. What are you trying to achieve?
3. Is the product a high margin or high profit product?
4. Do you have a theme in mind?
5. Will you use consistent colours?
6. Will you use double facing or pyramids to draw focus to a particular product?

Common Mistakes

- Too much or too little merchandise
- Too much merchandise - store looks cluttered and messy
- Too little merchandise - shop looks bare and uninviting
- Too many props - It is unclear to the customer what is for sale. Complexity can easily be overlooked.
- Lack of attention to detail - looks unprofessional.
- Display changes too infrequently - As a result, regular customers will grow bored and stocks will remain stagnant.
- Lack of underlying theme - Your efforts are in vain if it appears weak and halfhearted. Customers need a clear message.
- Poor housekeeping standards - nobody wants to buy unloved goods from a dirty shop. Cleanliness reflects an impression on your customers. Always aim to have high standards.
- No display budget - even if it's just having a basic display kit which allows you to suspend, hang, stick, staple items to display them to their best effect. Often the cheapest props are the most effective; washing lines and pegs are great for displaying clothes, fabrics etc. Experiment with everyday found objects.

2.3.5 Identify the equipment, Materials, Merchandise and Props

- Evaluate Space
- Determine Message
- Evaluate Merchandise
- Establish required props, fixtures & tools
- Consider signage requirements
- Estimate time to create
- Create and evaluate
- Maintain

2.3.5.1 Tools for Visual Display

Signs- These are used for informational purposes, brand promotion, product awareness, also used for guidance of the customer. To wrap things up, signs are another key instrument utilized in visual promoting. In any case, make certain to incorporate signs as a component of your visual promoting methodology.

Fig 2.3.14 Visual display

Banners- Put behind to exhibit the product.

Sensory Inputs- input such as sound, lights, fragrance are be used for targeting the customer through their senses. Main tools used for these inputs are music lightings focus lights and fragrance which the customer can experience inside the store.

Point of purchase display- customer buy what is see so in this method the product is kept so that customer can touch and feel it.

Floor Map – No matter what type of product(s) your store sells, keeping a story map nearby can help you design your item arrangements and visual marketing materials deliberately. This visual design allows you to sort and organize items in the most customer-focused manner. Moreover, a story guide can be used to identify an area within your store that has not been explored but could be used for signs and other visual marketing materials.

Planogram- Not to be mistaken for a story map, a planogram is another visual graph of a store's format — however, it centers explicitly on item arrangement. Planograms are regularly used in markets and retail stores to decide the ideal way to arrange and display items using the store's equipment. If a store has a grid wall, for example, the planogram will uncover the peg arrangement as per its particular items. So as opposed to intersecting your fingers and trusting that everything lines up, you can rest guaranteed realizing that your pegs, and their items, will fit perfectly by following the planogram.

Fig 2.3.15 Shelve Gondolas

Fig 2.3.16 Window Display

Fig 2.3.17 Dump Bin

Fig 2.3.18 Wall Display

Fig 2.3.19 Round Racks

2.3.6 Allocating Space

Space Management - It is the process of managing the floor space adequately to facilitate the customers and to increase the sale. Since store space is a limited resource, it needs to be used wisely.

Space management is very crucial in retail as the sales volume and gross profitability depends on the amount of space used to generate those sales.

2.3.6.1 Optimum Space Use

While allocating the space to various products, one need to consider the following points –
Product Category

- Profit builders – High profit margins-low sales products. Allocate quality space rather than quantity.
- Star performers – Products exceeding sales and profit margins. Allocate large amount of quality space.
- Space wasters – Low sales-low profit margins products. Put them at the top or bottom of shelves.
- Traffic builders – High sales-low profit margins products. These products need to be displayed close to impulse products.
- Size, shape, and weight of the product.
- Product adjacencies – It means which products can coexist on display?
- Product life on the shelf.

2.3.7 How to Improve and Measure the Impact of Visual Merchandising

- Keep track of the effectiveness of your visual merchandising to ensure your effort is worthwhile. This will also help you to improve future techniques. Measuring the success of your visual marketing methods will allow you to:
- Observe whether it's working or not - i.e. if something is proving difficult to sell, try moving the product or the same display to another area before giving up.
- improve your decision-making on which techniques to apply and when - eg if you have sold all of your inventory and you have no back stock, change your visual merchandising planto something which you have available in large amount.Measuringthe impact of visual merchandising techniques
- Here are some ways to help you measure the success of you visual merchandising practices. You can evaluate:
- Return on investment - if you have made significant changes to your retail space, it is important measure sales performance against previous weeks, months or seasons for comparative analysis and future planning purposes.
- ·Customer visits - Keep track of the number of people who walk by your store and those who enter it. In this way, you can evaluate the opportunity and options for attracting those who are less inclined to enter.
- Customer spend - evaluate a customer's average spends in one visit - is this more or less money than before you applied your visual marketing changes?
- Browsing time - consider how long customers spend in your store - is this a space where you are making a connection with customers and creating a welcoming experience.
- Returning customers - look at whether customers are coming back to your store and how often they return within a specific timeframe. This may also influence how you choose to target customers who visit less frequently.

2.3.8 Stock records to account for merchandise on display

Stock means all the products your business has for sale. Stock is also all the raw materials or material your business keeps and uses to make products or provide services. Different types of businesses have different types of stock. Here are some examples:

2.3.8.1 What is stock control?

- Stock control means organizing the way you:
- Receive your stock –Count and check the condition of products or materials you receive against the invoice or delivery note.
- Record your stock –Write down all products or materials coming into or going out of the store/warehouse.
- Store your stock – Keep the right amount of stock in a safe and practical way.
- Arrange your stock – Arrange the stock so that it attracts customers to buy and also makes it easy for you to see and count.
- Check the stock – Check and count the stock often to make sure that it is in good condition and that no stock is missing.
- Re-order the stock – Re-order the right stock, in the right quantity at the right time.

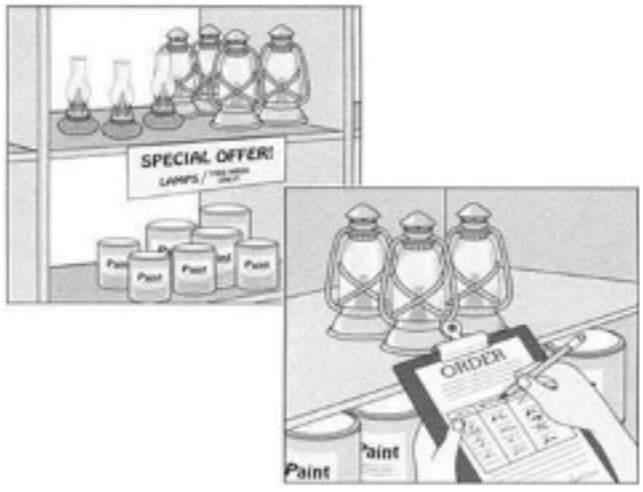

Fig 2.3.20 Stock control

2.3.8.2 How can stock control improve the business?

- Good stock control helps you to:
- keep the right goods and materials
- keep the right amount of stock - not too much or too little
- keep your stock in good condition
- prevent stock from being lost or stolen
- re-order stock at the right time.

2.1.8.3 Keep stock records

- If the store has many products or materials, use stock records.
- If the store sells fewer goods or materials, you may want to keep stock records only for expensive goods or materials.
- Use your stock records to see which goods sell well and which sell badly. This helps you to know what goods or materials to buy.
- Use your stock records to find out what stock to re-order, when to order and what quantities you need.

Stock records
Keeping stock records means writing down:
- all stock that comes into the store or warehouse, and
- all stock that goes out of the store.

Stock records are useful because they tell you:
- What product or materials you have sold or used
- How much of the productor materials you have sold or used
- When the product or materials were sold or used
- How much of the products or materials you have in stock.

2.3.8.4 Stock-Taking

It is important to know exactly:
- What kind of stock you have
- How much stock you have
- What condition your stock is in
- How much your stock is worth

To find out this information you must actually count measure or weigh all your stock. Stock-taking is a system of physically counting and writing down all the stock in your business on a stock-taking list.

Is stock-taking important?
Stock-taking gives you a lot of useful information. For example, when you count your stock you will find out:
- If any stock is damaged, expired or in bad condition
- Which goods sell quickly and which sell slowly
- Which materials and parts you use a lot of and which you use less of
- When to re-order, if you do not keep stock cards.

Exercise

1. Visual merchandising is:

a) the practice of making the most profitable merchandise the most visible.
b) the practice of making all the merchandise as visible as possible.
c) practiced by lower-end stores attempting to shake their "cheap" image.
d) the artistic display of merchandise and theatrical props to set the tone for the store.

2. It refers to the ways that stores use floor space to facilitate and promote sales and serve customer.

a) Store Front
b) Store Interior
c) Store layout
d) Interior display

3. Match the following:

a) Signs	(I) visual graph of a store's format
b) Banners	(ii) target customers through music, lightings focus lights and fragrance
c) Sensory Inputs	(iii)exhibit the product.
d) Planogram	(iv)visual graph of a store's format informational purposes, brand promotion, product awareness

4. How can one measure the impact of visual merchandising techniques?

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5. What is stock control?

Scan the QR codes or click on the link to watch the related videos

https://www.youtube.com/watch?v=xZv67O0kMcc&t=2s	https://www.youtube.com/watch?v=aApfcUqGzog	https://www.youtube.com/watch?v=9-Ng8wPd9Z4
Difference between sales and marketing	Handling Objections	Important elements of visual merchandising

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

3 – Perform various tasks for selling food products

FICSI
Food Industry Capacity and Skill Initiative

Unit 3.1 – Sell and promote food products to customers

Unit 3.2 – Manage Point-of-Sale (POS) systems

FIC/N9702

Key Learning Objectives

At the end of the module, the participant will be able to:

- Engage in selling and promoting activities of food products
- Illustrate the process of managing Point-of-Sale System

Unit 3.1 – Sell and promote food products to customers

Unit Objectives

At the end of this unit, the participant will be able to:

1. Identify the Types of sale promotions used to market food products
2. Define sales promotion techniques
3. Discuss about organoleptic evaluation
4. Explain about the type and material used in food items packaging
5. Choose the right food packaging
6. Identify the techniques of waste disposal
7. Categorize waste
8. Illustrate customer service

3.1.1 Introduction to Food Sales Promotion

The nature of food service product is such that it demands more immediate selling. For this purpose, sales promotion is a very important strategy for any food service organization to make and increase sales.

Sales promotions are widely used to market food to adults, children, and youth. An increasingly important component of the marketing mix, they are designed to stimulate consumers to take direct and immediate action i.e., to create an incentive to encourage consumers to purchase a product more quickly, more frequently, and/or in greater quantities than in the absence of the promotion.

Sales promotion is a direct and instant inducement aimed at an immediate increase in sales. It is also used to generate trials for new products. In short, it is a direct and immediate incentive for purchase. It involves temporary encouragement to increase the sale of a product/service. It depends on several promotional tools intended to motivate a prior customer response. Sales promotion comprises customer promotion (i.e. samples, coupons, rebates, price-off, premiums, contests, demonstrations), trade promotion-buying allowances (free goods, cooperative advertising, and push money), and sales force promotion (bonuses and contests). A well-planned sales promotion can result in publicity.

While there are many different types of sales promotions, most (but not all) are delivered in a retail setting (including food service outlets). Sales promotions are often components of integrated promotional campaigns involving a range of different marketing techniques.

Type of promotion	Example
Price discounts	• Direct price discounts such as "50% off" Coupons issued by the manufacturers or supermarkets • Discounts via supermarket loyalty cards Refunds
Extra-product price promotions	• Free with-purchase (buy-one-get-one-free) • Reduced price with purchase (buy one and get another at a reduced price) • Multi-purchase (e.g., three for the price of two) • Bonus-sized packages
Premium promotions	• Free-with-purchase gift • Reduced-price-with-purchase gifts
Collector promotions	• Collecting vouchers/food labels/beverage container tops in return for gift
Prize promotions	• Sweepstakes • Lotteries • Instant wins • Free draws • Competitions
Feature and display promotions	• Front-of-store display • End-of-aisle display • In-aisle display • "Shelf-talker" (graphic or sign that draws attention to the shelf) • Instore flyers • Instore banners • Advertising at point-of-sale • Food packages designed to attract attention • Leaflets with recipes using products on sale • Flyers containing nutritional information for products on sale
Sampling promotions	• Taste samples provided in a retail store • Free samples attached to another product

Table 3.1.1 Types of sale promotions used to market food products

- Though the majority of sales promotions take place in a retail setting, they can also be delivered to the consumer by mail, within print media, or via electronic means such as mobile phones. Sales promotions are sometimes termed "point-of-purchase" or "point-of-sale" marketing, but these terms may also be used to just refer to feature and display promotions.

3.1.1.1 Aims of Food Sales Promotion

Sales promotions are orientated towards changing the customer's short-run purchasing behaviour through:

- Increasing average spend and therefore sales revenue.
- Invigorating slow-moving product(s).
- Promoting a new menu, product or product range.
- Influencing impulse purchasing in a certain fashion.
- Amalgamating items for sale.

- Attracting attention to the business in slower months.
- The celebration of special events.
- Increasing customer visits.
- Establishing or enhancing awareness in potential customers' minds of the business and its products.
- Stimulating purchasing by facilitating communication of product/business features and benefits.
- Positively altering customers' opinions and attitudes.
- nforming to entice business.
- Increasing product/service profile.

This is achieved through offering additional value, financial inducement to purchase and try, advertising campaigns, and so on.

3.1.1.2 The Sales Promotion Techniques

Consumers are always the main target of every sales promotion technique. The main objectives and tools of consumer promotion are as follows:

Objectives

- Encourage and induce trial and purchase of a product
- Generate consumer interest, which should lead to trial
- Build traffic for a brand at the retail point
- Increase the rate of purchase

Tools

- Coupons, Gifts, Free offers, Price-offs, Discounts, Instalment-offers, Exchange offers
- Free samples; Demonstrations
- Trade Fairs and Exhibitions
- Consumer contests/Sweepstakes
- Rewards for patronage/loyalty
- Merchandising/Display
- Product exchange offers/Attractive financing schemes

3.1.2 Organoleptic Evaluation

Organoleptic properties are the aspects of food, water or other substances that an individual experiences via the senses—including taste, sight, smell, and touch.

Sensory evaluation is an invaluable tool for Quality Control as well as Research and Development.Customers perceive product quality with their senses, and as a result, organoleptic evaluations are an essential component of any Quality Control evaluations.

3.1.2.1 Various Organoleptic Factors

Sensory analysis involves the inspection of a product by the senses i.e. sight, smell, taste, touch and hearing for various quality attributes like appearance, flavor, aroma, texture and sound. These characteristics of a food product are briefly described below:

1. Appearance

Appearance is the first characteristics perceived by the human senses and play an important role in the identification and final selection of food. This is the visual perception of food comprised of color, shape, size, gloss, dullness and transparency. The appearance of a meal have shown impact on appetite stimulation or depression resulting in pleasure or total depression. The look of a food or beverage impacts crave ability and acceptance, before the product touches the lips. This is because we eat with our eyes before we ever smell or taste.

- The appearance of the food to our eyes is the most critical parameter. One eats with the eyes first!
- It is this feature of our senses that judges the food for its freshness, colour, appeal, dullness, glossy, juicy etc.
- If the eye appeal is not good then the food goes in for a complete rejection.

2. Flavour

It is sensory phenomenon which is used to denote the sensations of odor, taste and mouthfeel. Flavoring substances are aromatic compounds which are conceived by the combination of taste and odor and perceived by the mouth and nose. Odor improves the delight of eating e.g. aroma of freshly cooked rice and most of the baked products. Taste helps in identification, acceptance and appreciation of food.
It is perceived by the taste buds on the tongue. There are four types of taste perception: sweet, salty, sour and bitter. Sour and bitter are often confused. Lemon juice has a sour taste whereas coffee has a bitter taste. In case of mouth feel, nerves present inside the mouth are enthused by chemical or thermal responses e.g. coldness of ice cream or the fiery impression of pepper.

3. Aroma

Aroma is the first cousin of taste. These are volatile compounds which are perceived by the odor receptors of olfactory tissues of the nasal cavity. Aromatic compounds are released during the mastication process. Smell appraises the aroma of food that is important in the gratitude of flavor. A pleasant smell makes food delicious. To provoke a sensation of smell, the stuff must be in a gassy state. Furthermore, aroma is valuable in perceiving fresh, rancid or intermittently poisonous food.

4. Texture

The texture is perceived by a combination of senses i.e. touch, mouth feel, sight, and hearing. It is one of the most imperative feature of a food. If a customer bites a soggy biscuit or eats ice cream with a sandy texture, it is improbable they will be back. Texture is a prerequisite in the acceptance of numerous foodstuffs e.g. tenderness of meat and softness of bread. It also include the consistency, thickness, fragility, chewiness and the size and shape of particles in food.

5. Sound

Hearing deliberates the sounds made by food during preparation and ingesting e.g. the crackle of fried food, the effervescence of drinks, the cracking of hard biscuits. So, in sensory analysis, the senses are used to measure, analyze and interpret the organoleptic or sensory properties of food.

The crunchy bite of freshly sliced onions or the crackling sound of the crispies satisfies the sound element of the food.

One can accordingly see that the balance of organoleptic tasting completes the feeling of satisfaction. If even one element in the meal is missing, the overall experience doesn't appear correct.

3.1.2.2 Sensory Perception

Human senses

Sensory attributes of the food products are perceived by the sensory organs like eyes, tongue, nose, ear etc. by interacting with food components. The biological mechanisms involved in perception are discussed below:

- **Vision**: It is the first food attribute that is critical in the selection or rejection of food. The appearance of any product is accessed through the vision. Light waves after striking with foodstuff fall on the eye retina which is comprised of rods and cones. Light energy after transforming into neural impulses reaches the brain through the optic nerve. Rods respond to white light and communicate info regarding the lightness of the color. Cones are receptive to diverse wavelengths of light concerning 'color'. The brain deduces these indicators and we notice the appearance (shape, size, color, etc.) of the product.
- **Taste**: It involves the perception of constituents after being dissolved in saliva, oil, or water by taste receptors in the taste buds found superficially on the tongue and other parts of the mouth or gullet.
- **Smell**:The aroma or odor associated with food products is sensed by olfactory receptors present in nasal epithelium. Hence, for the detection of aroma or odor, volatile molecules must be shifted to the nasal cavity. These compounds further move in the nose during inhaling or breathing or during eating through the back of the throat. A specific odor is the outcome of numerous volatile compounds.
- **Sound**: It is detected by tiny hair cells in the ear stimulated by the sound waves. The noise produced by food during eating contributes to the perceived texture of a food, e.g. effervescence of a carbonated drink, crispness of an apple or puffed rice. The sound waves produced during the consumption of food products are conducted by the air and/or bones in the jaw and skull known as intra-oral perception.
- **Touch**: Texture is a complicated phenomenon and it can be divided into categories including mechanical (hardness and chewiness), geometric (graininess and crumbliness) and mouth-feel (oiliness and moistness). Generally these are professed during biting, chewing after swallowing.

3.1.2.3 Food Product Sampling

Food samples can impact the healthfulness of products purchased. Offering customers a healthy food sample, or one that is framed as healthy, can lead to more purchases of fruits and vegetables and healthier choices during the shopping trip. Distractions while sampling, such as having a shopping list memorized, also lead to higher choice of the sampled products.

1. Taste Tests

If you are carrying fruits or vegetables in the store that are great for snacking (carrots, grapes, etc.) a simple taste test can go a long way to let your customers experience the excellent quality of produce you

have decided to carry and to give them ideas on quick snacks to serve their family. With taste tests, a little goes a long way.

2. Food Demonstrations

A food demonstration is when you actually prepare a healthy fruit, vegetable or any other food product recipe so that your customers feel more comfortable with the idea of buying more food products to prepare at home. Keep it simple with recipes that require very little equipment (like smoothies). Both taste tests and food demonstrations are a great way to promote the other items that one carry in their store.

Fig 3.1.1 Food Demonstration

3.1.3 Packaging Food Items

Today's consumer is not only looking for value in the products they purchase but convenience in packaging functionality. When people buy an item at their local grocery store, they are more concerned about what's wrapped inside the packaging than the packaging itself. Many reasons are considered for using packaging on a given product such as display, convenience, for handling, sale, security concerns, barrier protection, physical protection, information transmission, agglomeration or containment, marketing and finally portion control. Product packaging plays an important role in the marketing success or failure of many products, especially for non-durable consumer products.

Food packaging is the enclosing of food for protection from:

- Environmental factors that may cause contamination, damage, or decay in the process of transport, storage or selling;
- Intentional modification of the product, or what is known as tampering.

In addition to protection and preservation – and thus maintenance of the food's shelf life – food packaging is used for containing the foods, providing information about the ingredients and nutritional aspects of its contents, and providing convenience for customers during usage and consumption.

Packaging depends on the type of food being packaged, and it varies over a wide array of materials and forms.

Needs / Wants of consumer from packaging

- Providing consumers with ease of meal preparation.
- Delivering a choice incooking methods.
- Maximizing shelf life.
- Portion control..

3.1.3.1 Types of Food Packaging

Packaging materials come in different shapes with various functions relative to their properties. The packaging material should have a balance between its shape and its features. Given the packaging's objective of preservation and containment of food, the packaging material can be solid, flexible, or semi-flexible.

- Solid packages include bottles, trays, cans, jars, and caps.
- Flexible packages include bags, cling films, bubble wraps, shrink wraps, squeezable tubes, foam trays, stand-up packets, and vacuum bags.
- Semi-flexible packages include caps and closures, boxes, and tetra packs.

Food packaging types are different in various ways, such as weight, size, durability, and barrier properties.

3.1.3.2 Food Packaging Materials

Choosing the adequate material for packaging in various types of food depends on the functions that the package is presumed to fulfill. These functions include shielding the foods against moisture, temperature variations, oxygen, light, and biological microorganisms. Also, damage protection, permeability, food identification, and chemical and optical properties play a significant role in material selection.

Conventional food packaging materials currently used vary between metals, paper, glass, and plastics.

1. Metals

There are various forms of metal food packaging, such as cans, tubes, containers, films, caps, and closures. Cans are generally made of aluminum or steel, and they are the most commonly used metal packages of food and beverages. They can be recyclable and are mostly coated with a layer of organic material to protect any contact between the food and the metal.

2. Aluminum

Aluminum is generally used for foils, tubes, beverage cans, trays, pouches, and coffee capsules. It has good resistance to temperature fluctuations and acts as an excellent gas barrier, which increases the food's shelf-life. It has excellent form ability and malleability and can be easily marked. It is comparatively harmless than other options, lightweight, and can be reused again indefinitely.

Alloying elements, such as magnesium and manganese, are sometimes added to aluminum to increase its strength. Aluminum can be used in solid, flexible, and semi-flexible packaging. It helps to maintain the

freshness and aroma of the foods and is good for protection from radiation, oxygen, moisture, oils, and microorganisms. Soft drinks, seafood, and pet food are commonly enclosed by aluminum packages.

Some aluminum grades used in food packaging include AA 3003 (O, H22, H24), AA 8006, AA 8011, AA 8079, and AA 1235.

Fig 3.1.2 Aluminum foil

3. Steel

Steel is mostly used for containers, caps, cans, utensils, and closures. Organic coatings are also required to resist corrosion. Steel cans are fabricated from tin plate, which is tin-coated steel, or from electrolytic chromium-coated steel (ECCS), also known as tin-free steel. Steel, actually a permanent material, so it can be recycled open-endedly while keeping its quality.

Fig 3.1.3 Steel can

Tin plate is an amazing hurdle to gases, water vapor, light, and odors. Tin plate has good ductility and formability and is very easy for sterile products for it can undergo heat treatment and hermetic sealing. It is light with remarkable mechanical strength and is suitable for impressive decoration. Familiar applications of tin plate include drink cans, processed foods, and powdered foods.

Tin-free steel also has good formability and strength and is quite cheaper than tin plate. The chrome/chrome oxide in ECCS renders it a good material for coating adhesion, such as lacquers and paints. It has good resistance to heat and black sulphide stain, which makes it convenient for making fish cans. Uses of tin-free steel include food cans, trays, bottle caps, can ends, and closures.

4. Paper

Paper is one of the oldest packaging materials, earlier in the 17th century. Paper and paperboard are mostly used for packaging dry foods. On the other side coating or waxing, their uses extend to the

packaging and serving of wet and fatty foods. They are commonly used in packets, milk cartons, folding cartons, paper plates and cups, bags and snacks, and wrapping paper.

Paper is used for non-permanent food containment and protection due to its high permeability and inability to be sealed with heat.

Paperboard is a comparatively thicker and heavier material than paper. It is widely used as secondary packaging that is not in direct contact with the food.

Another form of paper is paper laminates, which are coated or uncoated paper based on Kraft and sulphite tissues. They have vast barrier properties and are used in packaging spices, herbs, soups, chips packets, etc.

Fig 3.1.4 Paper bag

5. Glass

Glass is another permanent packaging material that has been used for millennia. Glass is well-known for reliable, environment friendly, and least toxic materials for packaging foods and drinks. Its advantages include imperviousness, inertness, strength, hygiene, resistance to tampering, quality colour, design, attractive decoration potential, transparency, chemical propriety, microwave ability, and heat treatability.

There are two types of glass packaging most widely used for foods and drinks: narrow-neck bottles and wide-opening jars and pots. Glass bottles are commonly used for alcoholic drinks, soft drinks, and potable water. Foods packed in glass containers ranges from coffee to dairy products, spices, spreads, syrups, vegetables and fruits, and meat and fish products.

Fig 3.1.5 Glass

6. Plastics

Plastics are the most common and broad materials used for food packaging. Some of their widespread uses are bottles, trays, bags, foils, cups, pots, pouches, and bowls. The volume of plastic assign to food packaging amounts to around 40% of plastics. The convenience and widespread use of plastic in food packaging is owed to its low cost, ease of processability, formability, chemical resistance, lightweight, and a variety of physical properties. However, plastic suffers from permeability to gas, vapour, and light. It is not reliable material.

Plastics can be classified into two main categories: thermosets and thermoplastics.

Thermosets are polymers that irrevocably solidify upon heat and are non-reformable, which makes them unsuitable for food packaging. Thermoplastics, on the other hand, soften when heated and can retain their initial conditions at room temperature. This renders them perfect for food packaging. Besides, despite certain functional restrictions, thermoplastics are recyclable via melting, reproduction, and reuse as new products.

Despite the health and safety concerns regarding residual components from plastic, plastic use continues to grow compared to the aforementioned conventional materials because of its inexpensiveness, thermostability, microwave ability, and ease of fabrication into countless shapes and sizes.

Of the plastics used for food packaging, polyolefins and polyester are the most common materials. Other materials include polyvinyl chloride, polyvinylidene chloride, polystyrene, polyamide, and ethylene vinyl alcohol.

Fig 3.1.5 Glass

3.1.3.3 How to choose the right food packaging

There are many types to choose, from glass, paper, corrugated box to tin can packaging. However, not all food packaging is the same.

You need to ponder over two key points while determining the right food packaging:

- The packaging should keep your specific food product safe
- It should catch the customer's eye.

Being a savvy business, you want the food packaging right for the environment and waste management practices as well. After all, they vary by certain properties which are determined by:

- Material
- Design
- The type of food being packaged
- Shelf-life
- Environmental conditions
- Ease of use
- Disposal
- Cost related to production and distribution.

In other words, every food packaging material has its traits. Some certain foods are likely to interact with some packaging types. Here are some key traits of major food packaging products:

1. **Glass:**

Pros	Cons
Moisture and heat resistant	Brittle and breakable
Non-reactive	Not easy to carry
Transparent (lets consumers see products)	Heavy and bulky to transport
Reusable/recyclable	

2. **Aluminum**

Pros	Cons
Resistant to moisture, heat, gases, and corrosion	Unable to be welded
Lightweight	Less strength
Recyclable	Limited shapes
	Expensive

3. **Tinplate**

Pros	Cons
Water and heat resistant	Reacts with foods
Durable	Requiring a can opener
Recyclable and easy to separate from waste (as it is magnetic)	Heavier than aluminium
A cheaper alternative to aluminium	

4. **Tin-free steel**

Pros	Cons
Strong and durable	Unable to be welded
Resistant to heat	Prone to corrosion
Recyclable	Requires a can opener
Cheaper than tinplate	Heavier than aluminium

5. **Paper and paperboard**

Pros	Cons
Lightweight	Prone to moisture and humidity
Good strength	A poor barrier to light
Low cost	Tears or damages easily
Made from renewable resources	
Recyclable	

6. **Polyesters**

Pros	Cons
Strong	May pose an environmental threat in debris
Ideal for hot filling	
Excellent barrier characteristics	
High clarity	
Shatter and tear-resistant	

3.1.4 Waste Management

Waste is defined as unwanted and unusable materials and is regarded as a substance which is of no use. Your customers expect you to have the products they need, when they need them. But to do that it's almost unavoidable that packaged goods expire, produce goes bad and excess inventory needs to be thrown out. Waste has been a major environmental issue everywhere since the industrial revolution. Besides the waste we create at home, supermarkets and other public places, there are also those from hospitals, industries, farms and other sources. Humans rely so much on material things and they all (almost) end up as waste.

3.1.4.1 Categories of Waste

1. Wet Waste

Wet Waste is biodegradable waste and includes Cooked and uncooked food, fruits, vegetable peels, flower waste, and other organically decomposable waste. This waste is collected on a daily basis and can be handed over in a green bin. We have classified the following streams as wet waste:

- Vegetable/fruit peels
- Cooked food/Leftovers
- Egg shells
- Chicken/fish bones
- Rotten fruits/vegetables
- Tissue paper soiled with food
- Tea bags/Coffee grinds

2. Dry Waste

Dry Waste is typically defined as any waste which will not rot or disintegrate over time and has little or no moisture content. Dry waste can also be described as inorganic or non-biodegradable waste given its lack of food products. Most dry waste is recyclable and below is a list of common dry waste items:

- Metal
- Glass
- Plastic
- Wood/Wooden Objects
- Paper & Cardboard
- ·Fabric/Textiles
- Aluminum Foil

3. Hazardous Waste

Hazardous Waste is a waste with properties that make it dangerous or potentially harmful to human health or the environment.

3.1.4.2 Waste Segregation

Garbage bins are categorised into different colours- green and blue, in order to differentiate the type of wastes put into them. It is essential to separate them out from other types of waste, in order to be safely processed.

There are several different colours that indicate different types of waste. These colours also define the level of caution that needs to be taken when handling such materials.

Colour of Garbage Bins for dumping various types of wastes

Wet Waste	Dry Waste
Fruit & Vegetable Peels and pieces	Plastics bags, bottles, packing item
Leftover food	Food packets, milk sachets
Used tea leaves/ Coffee Powder	Tickets, Newspapers
Match Sticks	Computer printouts
Used/ Soiled tissue Papers	Disposable Crockery, Pamphlets
Shredded newspapers	Glass bottles and jars,
Flowers, Plant leaves, Compostable materials	Tetra pack, Aluminiumcans, etc.
Meat and Poultry waste	Thermocol

Table 3.1.2 Colour of garbage bins for dumping various types of wastes

Tips

- Shredded papers are hard to recycle hence are dumped in green dustbin with wet waste. Papers with long fibre are easy and good to recycle hence preferred more and goes into dry waste blue dustbin. It is advisable to dump shredded paper with some compostable garbage thus making it compost friendly. Try not shredding papers, if at all necessary, cover with white ink the lines you want to hide and then dispose the papers in wholesome condition. White ink does not affect recycle.
- Used/ Soiled Tissues cannot be recycled and hence is disposed in the green dustbin with wet waste

3.1.4.3 Techniques of Waste Disposal

Between the range and variety of items that are in the store and the growing amounts of trash dumped in landfills each year, effective waste disposal is a necessity. Being aware of all the possible methods will make the task of disposing of waste much easier.

1. 3 R's

The principle of reducing waste, reusing, and recycling resources and products are often called the"3Rs."

- **Reducing** means using items with care to reduce the amount of waste produce.
- **Reusing** involves the repeated use of items or parts of items that still have usable aspects.
- **Recycling** means the process of converting waste products into new products as a resource.

Waste depreciation can be achieved efficiently by focusing primarily on the first of the 3Rs, "reduce," followed by "reuse" and then "recycle." The waste hierarchy refers to the "3Rs" i.e., reduce, reuse, and recycle, which classify waste management strategies according to their eligibility. The 3Rs are meant to be a hierarchy, in order of importance. The waste hierarchy aims to extract the maximum practical benefits from products and to produce the minimum amount of waste.

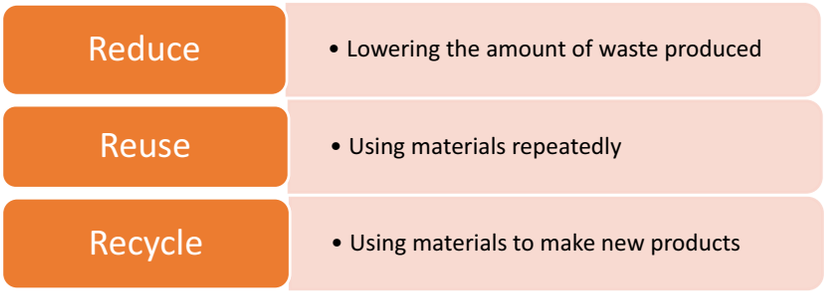

Fig 3.1.6 Waste hierarchy

2. Some other techniques

i) Composting: It involves the breakdown of organic waste in the presence of microorganisms, heat, and moisture. Three types of microorganisms are involved in the process of composting i.e. bacteria, fungi, and actinomycetes that act upon the waste to convert it into sugars, starch, and organic acids. These to be acted upon by high-temperature bacteria, which prevail in the compost heap and help to promote the stabilized compost.

Composting has the following advantages:

- Recycling of waste by the generation of useful manure, which is organic.
- Reduction in volume of waste to be disposed of on land.
- No requirement for any high-end technical expertise.

ii) Vermi composting: This is a process, in which food material and kitchen waste including vegetables and fruit peelings, papers, etc., can be converted into compost through the natural action of worms. Anaerobic condition is created by the exposure of organic waste in the air.

3.1.5 Customer Service

When a customer purchases product, he or she expects it would meet his or her needs and obtain satisfaction from the newly purchased item. Customer satisfaction is the guarantee of the profit for the seller. Companies pay more attention to their customers, their needs, expectations and analyze their level of satisfaction form purchased goods. The objective of market activities undertaken by modern enterprises is to build a solid relationship with customers. The ultimate result is to gather and preserve their loyalty and acquire new customers.

However, in real life in spite of the quality control measures, certain low quality products reach the market, which do not meet customer needs. Customers can express their lack of satisfaction by making a com-plaint. Complain is the customer way to communicate with the seller that the quality of the purchased product or service is wrong or below customer expectations.

During the use of purchased product customers make their own product quality assessment and in case of lack of satisfaction, or satisfaction level below customer expectations, product may be returned to the seller.

Below are a few key customer service features every supermarket/store should have:

1. Customer Assistance Locating Items
Stores stock have numerous items that are distributed throughout the store. While a well-organized store formation is important for directing customers to their items, successful stores realize that they must go beyond this. Successful stores understand the importance of having knowledgeable store associates on staff at all times to assist customers with finding their items.

2. Knowledgeable Store Associates
Stores should make sure that all of their customers' questions about any of the products get answered, therefore they should constantly keep their store staff up to date on all of the products. For example, if a customer have a question about a particular type of produce a store carry, the store associates should be able to help answer the customer question so that customer can make an informed decision.

3. Grocery Carry-Outs
Store carry-outs are a rare amenity these days. Not only are they convenient for the customer, but they also represent the store's devotion to customer service.

3.1.5.1 Dealing with Difficult Customers

Grocery store workers do everything from stocking shelves to handling cash. The majority of grocery store workers must deal with customers no matter their job function, and this can be challenging, especially during busy periods. The grocery store environment can be intense. Store managers and associates must handle difficult customers discreetly and professionally to keep them satisfied and retain their business, regardless of the circumstances.

- Pull the customer aside. Guide the customer to the store service desk, or to an area that doesn't block customer traffic if the incident occurs a distance away from the service desk. A difficult or angry customer causing a commotion in a crowded store can prompt other customers to jump in, and still others may get upset and blame you for their ruined shopping experience if you fail to move the difficult customer to a quiet area.

- Listen to the customer. Belligerence and anger sometimes arise from frustration at not being heard. Make eye contact while the customer explains the problem. Ask them to point out the problem, and if it results from faulty merchandise, examine the item closely. Avoid becoming defensive, and instead of interrupting the customer, wait until he finishes explaining his problem and why he's angry before you respond.

- Give the customers what they want to end the problem quickly, if possible. Customers are generally satisfied as long as they get what they want. If such is the case at your store, don't argue back with the customers or refuse to give them what they wants because you disagree with them. If the customer asks for refund on a partially used item, for example, give her money back to avoid further confrontation.
- Compromise with the customer. Offer the customer a substitute item, a rain check or a gift certificate if you are unable to provide the merchandise he wants. Customers sometimes get upset in stores during high traffic times, especially if they think store management isn't doing enough to make the long lines move faster. To get a difficult customer to calm down, open up an additional cash register and add extra grocery baggers, if possible, or discreetly invite the difficult customer to check out at the service desk.

Exercise

1. Composting involves the breakdown of organic waste in the presence of microorganisms, heat and moisture. (T/F)

2. Reusing means choosing to use items with care to reduce the amount of waste generated. (T/F)

3._____ are the aspects of food, water or other substances that an individual experiences via the senses.

4. _____include bags, cling wraps, bubble wraps, shrink wraps, squeezable tubes, foam trays, stand-up packets, and vacuum bags.

5. This is the visual perception of food comprised of color, shape, size, gloss, dullness and transparency.
a) Appearance
b) Flavor
c) Aroma
d) Texture

6. This metal is generally used for beverage cans, foils, tubes, trays, pouches, and coffee capsules.
a) Aluminum
b) Steel
c) Paper
d) Glass.

7. Which one of the following is not a factor to consider while choosing packaging for food?
a) Material
b) Design
c) Convenience
d) Shelf-life

8. Which one of the following is not an advantage of Tin plate used a packaging material?
a) Water and heat resistant
b) Durable
c) Reacts with foods
d) Recyclable

9. Which one of the following is an advantage of glass used a packaging material?
a) Brittle and breakable
b) Lightweight
c) Non-reactive
d) Prone to corrosion

10. It is typically defined as any waste which will not rot or disintegrate over time and has little or no moisture content.
a) Wet waste
b) Dry waste
c) Hazardous waste
d) Non-hazardous waste

Unit 3.2 – Manage Point-of-Sale (POS) systems

Unit Objectives

At the end of the module, the participant will be able to:

1. Explain the concept of Point of Sale (POS)
2. Illustrate the capability of POS system
3. Identify the types of POS hardware
4. Demonstrate POS software features
5. Illustrate POS architecture·

3.2.1 Concept of Point of Sale (POS)

The word POS refers to “Point of Sale” or “Point of Purchase”. In modern retail, the terms “POS” and “POS Terminal” refer to Computer Hardware H/w and Software S/w which is used for billing the customer for the purchases made. They are used to track inventory as they show the below mentioned figure. There may be different H/w and S/w used for functioning of sale purchase in a retail store.

Fig 3.2.1 Functioning of POS in a Retail

On the surface, retail POS systems may seem relatively straightforward:

- A customer brings products they want to purchase to the checkout counter
- The sales associate scans the products' barcodes, which adds all the items to the order, calculates sales tax, and provides the total amount due
- The customer pays with either cash or credit card (or debit card), and the transaction is complete

Fig 3.2.2 Point of Sale

Thus Point of sale, or POS as it is more commonly abbreviated, refers to the capturing of data and customer payment information at a physical location when goods or services are bought and sold. The POS transaction is captured using a variety of devices which include: computers, cash registers, optical and bar code scanners, magnetic card readers, or any combination of these devices. It is very well depicted from the figure that the POS is a combination of software and hardware specifically designed for the retail store.

3.2.2 Capability of POS System

Supermarket/Hypermarket retailers need to be concerned of their customers' on a daily basis household needs. They want to provide and more less than one roof while providing a world class shopping experience in one roof. Managing manifold departments with conflicting product lifecycles, their shelves need to be stocked with a wide range of food items. These may include basic necessities such as fruits and vegetables, dairy products, bakeries and meat product. Leading brands and private label brands are both provided. The technological infrastructural support provided to make the most of product availability while at the same time minimizing inventory carrying costs.

In the most fundamental wisdom, a Point of sale (POS) system is an overvalued Cash Register. The most basic POS system consists of a computer, a cash drawer, receipt printer, a monitor, and an input device such as a keyboard or scanner. In Table below we would throw a light on different hardware (H/w) which are used in a POS Systems along with the description and its images.

Hardware Description	Hardware Image
M20 is based on embedded system, with high adaptability, security and intellectual faculties. Utilizing advanced technologies, M20 is one of the top grade EFT-POS terminal products in India.	
Basic Card is the first smart card programmable in BASIC. It is easy to use, open to anyone, requires no special training, and competitively priced. Using the Basic Card anyone can programme their own smart cards and this takes only a few hours of your time.	
17" Touch screen display with integrated Magnetic & Smart card readers 80mm Thermal Printer, 10/100 Base-T Ethernet	
Touch screen Point of sale system with 15-inch touch screen, Intel Atom 1.6G, 80GB HDD, 1GB RAM. It is All a one Touch POS System may Touch POS System may be widely used in Retail, hospitality such as Restaurant, Coffee shop, Pizza Parlour, etc.	
Most bank cards no longer rely on a magnetic strip to store customer account details. Instead of bank cards using smart cards. The smart cards carry a small amount of computer memory with the account information stored inside. Smart cards are more secure (since the data is encrypted) and more reliable than magnetic strip cards. When a customer wants to pay for goods in a store, the customer inserts the bankcard into a smart card reader and then typed a PIN to confirm that they are the rightful owner of the card. Once the PIN is verified by the customer, he/she can remove the card. One more reason is, this system has proven the extra level of security provides for users: Not at all does the bank card need to be handled by anyone other than the card owner, so with this system, there is very little chance of the card being stolen or copied by another person.	

Table 3.2.1 Pictorial view of various POS systems

POS system saves money, provide productivity gains, increases efficiency and accuracy in database, and can cut down the amount of time.

The POS Terminal is capable of performing many of the following tasks:

- Scanning the item bought by the customer
- Preparing the invoice for purchases made by the customer
- Printing the receipt
- Accepting the payment in:
  1. Cash
  2. Credit card / debit card
  3. Cheque
  4. Gift card
  5. Discount Coupon
  6. Vouchers / food coupons
  7. Credit note
- Recording or redeeming the points earned by the Member of Loyalty Programme
- Print Discount Coupons
- Weigh the items using weighing scale attached to the POS
- Display promotional messages and/ or bill value on the customer display
- Handling customer returns and returning the monies or credit note to the customer
- Handling exchange of goods
- Handling promotional schemes such as "buy 1 get 1 free" or more complex deals
- Track the inventory

3.2.3 Common types of POS hardware

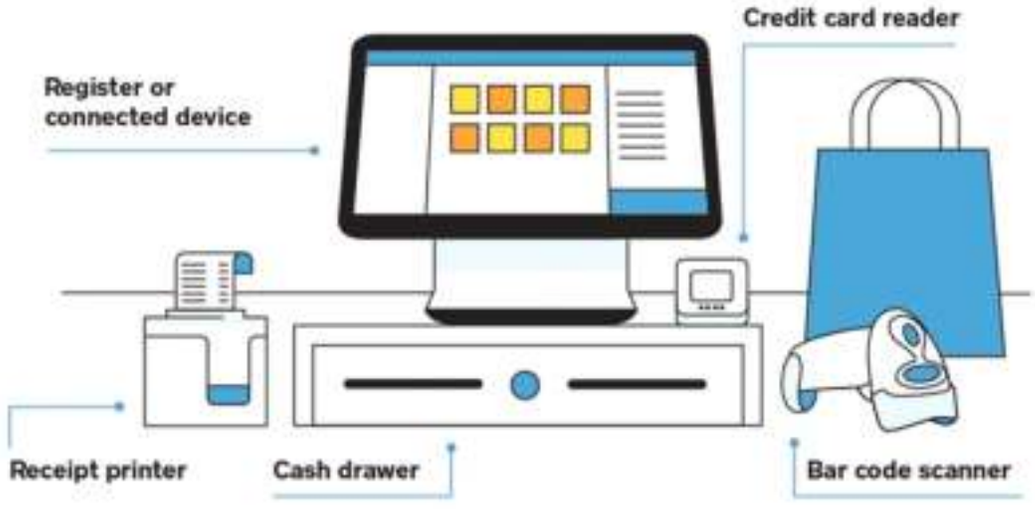

Fig 3.2.3 Common types of POS hardware

1. Register

The register assists you when processing a customer transaction.

2. The connected device, like an iPad or other tablet

Using a portable device as an alternative to a monitor can be very effective. Tablets or iPad can be propped up with a stand so that others can clock in or out.

3. Credit card reader
Through a card reader, customers can securely pay with a credit card in-store, whether it's a contact less payment method, a chip card, or a magstripe (magnetic stripe).

4. Cash drawer
It's important to have a place where you can keep cash even if you accept contactless payments. A POS the system that tracks drawer activities can minimize fraud.

5. Receipt printer
Customer paper receipts show what they purchased and how much they paid.

6. Bar code scanner
Using a bar code scanner to read product details, you can ring up items. You can also check the price, inventory, and other details.

3.2.4 POS Software Features

1. Payment processing
Payment processing is one of the core functions of a POS system. As soon as a customer buys an item, the POS system processes the purchase. There are several different payment methods a POS system might accept:

- Cash
- Secure online payments through your eCommerce site
- A Magstripe card is a credit card that is swiped
- Card with an embedded chip is referred to as a chip card
- Payments using contactless cards or mobile wallets (e.g., Google Pay or UPI)
- The card-not-present transaction occurs when you need to manually input the credit card information for a customer who is not present in front of you. Customers also enter their payment details when they check out online.

2. Inventory management
Inventory management software allows you to keep tabs on all your products. Some automated inventory software can connect with your sales data and let you know when an item is running low.

3. POS reports
POS reports give you a quick look into how much you're selling and earning. Clear reports can help you sell more and make better business decisions.

4. Customer relationship management (CRM)
If you are using POS software and CRM tools, you can track what customers bought and when. You can use this information to personalize your communications, marketing, and customer service.

5. Receipts
Processing refunds is easier when there is a digital or paper trail associated with the purchase. Additionally, they can improve the appearance of your store.

3.2.5 POS Architecture

It is very well depicted from the Figure below that the POS Architecture is bifurcated into three-tier approaches, i.e. interface, secondly master, and finally transactions.

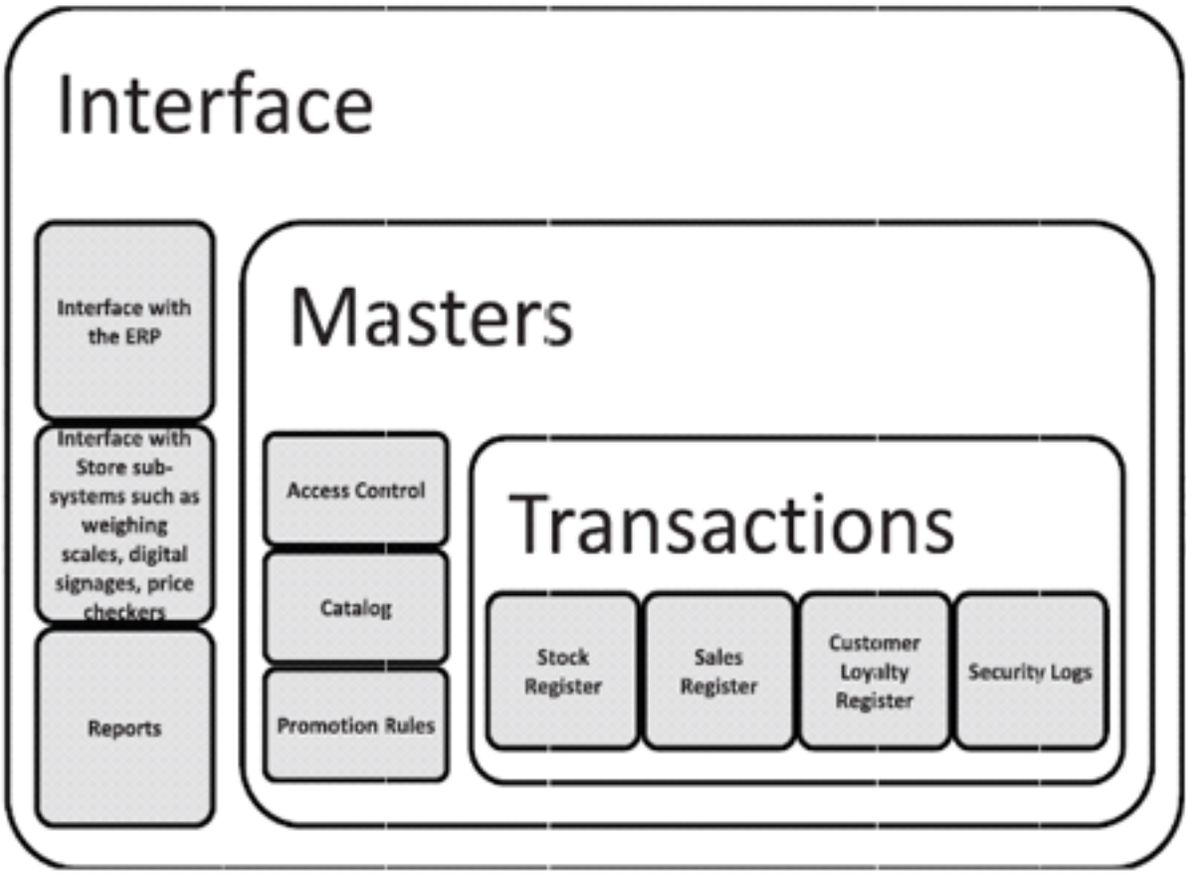

Fig 3.2.4 POS architecture

3.2.5.1 Transactions

At the core of the POS is an accounting system which records various transactions taking place at the POS.

1. Stock Register

The Stock Register has details of the stock quantity of all the SKUs (Stock Keeping Units). In a small store scenario, the stock register is a very important part of the POS. In large stores, the stock register is either at the Store POS Server or at the ERP server. When there is a stock outward transaction such as sale or return to vendor, the stock of the particular SKU gets reduced in the Stock Register. When there is a stock inward due to purchase or customer return, the same will increase.

2. Sales Register

The Sales Register records each customer invoice in case of Sales transaction or Credit note in case of return from customer in monetary terms. It records if the transaction was paid for with cash or credit / debit card or other payment modes such as Gift Card, Vouchers or Credit Note. Thus the Sales Register role includes:-

- Customer Billing: The cashier is able to scan the articles, prepare the bill and accept the payment.
- Customer Returns: The cashier is able to accept the goods returned by the customer and either refunds the monies or issue a credit note.

- Cash Management: Using this feature, the POS terminal's day's or shift's earnings through various payment modes are managed and reconciled with the physical cash available.
- Customer Loyalty Register: Due to Sales Transaction at the POS, the customermay earn Loyalty Points or he may redeem Loyalty points. It is important to keepan account of the same at the POS.

In large stores / chains, the POS will capture only the transaction and the main Customer Loyalty Database will be maintained at the central location. The most common features provided are:

- Enrollment in the Loyalty Programme
- Loyalty Point query
- Loyalty point redemption
- Campaign Management Tools
- Customer Complaints Register

3. Security Logs

In order to reduce the losses due to either negligence or wrong intentions, the POS systems are designed with several security features and can be configured as per the needs of the retailer.

3.2.5.2 Masters

The Masters contain the data which changes less frequently and is referred while making a transaction. In case of POS System, the following masters are important, though some systems may have many more Masters.

1. Product Catalog

The product catalog contains information about all the SKUs being offered for sale at the store. The information comprises of:

- Article Code or SKU Number or EAN Code (bar code of the article)
- Price
- Indirect Taxes to be paid by the customer such as VAT (Value-added-Tax)
- Discounts along with pricing conditions
- Quantity in stock
- Manufacturer
- Distributor
- Brand
- Category / Sub-category of the article as per the stores MMS system
- Product Description

2. Promotion Rules

Promotions are core to the modern retail. This is a very powerful component of the POS Application. It allows configuration and execution of complex pricing conditions. In some cases, the POS is programmed to offer varying discounts on the next article in consumer's basket based upon the articles already scanned or if the customer is a member of a loyalty programme, then different discounts (at line item level or at bill level) can become applicable. The Rule Master contains simple to complex promotional rules. Typically, they are of following types:

- Item/Line Level Discounts
- Bill Level Discounts
- Product Combination Discounts
- Volume / Value based Discounts
- Customer specific discounts
- Time based discounts

3. User Management and Access Control
To maintain the integrity of the system, it is important to manage access rights of users. These rights define which users can do what kind of operations on the system. At the retail environment, for the sake of Segregation of Duties, many operations need more than one user.

3.2.5.3 Interfaces

1. Other Store Sub-systems
The POS needs to exchange data with other systems / devices such as:

- Computer: The most important component of a POS system is the computer that Point of Sale (POS) runs the POS system software. The system can be a stand-alone desktop or a network terminal or touch terminals. Touch Terminals also come with options for integrated magnetic stripe readers and fingerprint sensors and save a significant amount of counter space.

Fig 3.2.5 Computer hardware used in retail store

- Display Screen: The screen can be ordinary Computer Monitor or LCD or Touch Screen. Due to ease of use, touch screen monitors are being used very widely in retail environment.

- Pole Display: The customer display on a POS cash register is called a Pole Point of Sale (POS) Display. It shows items, prices and other information to the customer, and can also be used to display other messages pertaining to product specifications, discount offers etc. It helps in gaining confidence of the customer.

Fig 3.2.6 Pole display used in retail firm

Fig 3.2.7 Programmable keyboard customized for the Retailer

- Cash Drawer: The drawer contains cash and has a lock and key for safe keeping of the cash at the POS. During billing, when the receipt is printed, the cash drawer opens automatically. This is where the cash and cheques for transactions are stored.

Fig 3.2.8 Cash Drawer

- Electronic Weighing Scales: In Supermarkets, weighing scales are used for weighing loose grocery, vegetables and certain dairy items. The weighing scales are intelligent enough to transmit the weight to the POS Terminal. In some cases, the weighing scales are kept at different location within store away from the POS. There, the weighing scale can print a barcode sticker with the weight and price of the commodity.

Fig 3.2.9 Electronic weighing scales used in super market

- Electronic Data Capture (EDC) Terminals: EDC Terminals are used to swipe credit /debit cards transactions or loyalty cards. This device decodes the information required for the credit card transaction - stored on Tracks 1 and 2 of the black magnetic stripe on the back of the credit card. There are a variety of models available. Slim models attach to the monitor/ keyboard, or stand-alone units that sit on the counter or cash drawer. They are connected to the networks of the credit card unions such as Master Card, Visa or National Payment Corporation of India.

Fig 3.2.10 EDC terminals used in malls / retail store

- Signature Capture / Transaction Terminals: While making a credit card transaction, the customer is required to sign the credit card receipt. These receipts need to be retained by the retailer as a proof which often makes it cumbersome. Instead, the retailer can use a Signature Capture terminal which is directly connected to EDC Terminal. The customer sees the details of the transaction on the screen and signs his name. This then gets stored in the POS System as an image thereby improving the efficiency and eliminating the need to keep physically copy of the receipt.

Fig 3.2.11 Signature capture / transaction terminals

- Printers: The Printer prints customer receipts, credit notes or promotional coupons as required. In high volume store formats such as supermarkets, Quick Service Restaurants, thermal printers are used which print fast. In some formats like apparel, retailers still use Dot Matrix Printers or Impact Printers which are slow and create a lot more noise.

- Barcode Scanners: Modern retail uses barcodes (and in some cases RFID tags)through their supply chain for identifying the articles. As the number of SKUs tend to be very high and Article Number tends to be very long (5 digits to even 30digits!), a manual entry can lead to errors which can be very costly for the retailer.

Fig 3.2.12 Barcode Scanners

- Price Checkers: The Price Checker Kiosk is a device which is attached to the POS system. It has a display screen and a bar code scanner. The customer scan the bar code on the product and kiosk displays the price and other related information of the product. The system may be programmed to make special offers or suggest complimentary offers which could enhance the customer shopping experience. The Price Checkers Kiosk could be used as digital signage to promote product or other social causes.

Fig 3.2.13 Customer Displays / Digital Signage at Retail Store

- Mobile POS Device: Mobile Point of Sale (POS) software incorporates the power and functionality of a traditional POS workstation into a mobile device such as tablets and smartphones that allows the retailer to service customers anywhere at any time. In addition to enhancing customer service, Mobile POS allows store managers and associates to spend more time on the sales floor, improving efficiency and profitability. Retailers can also use it to influence consumers' purchasing behavior, such as suggested purchases, upselling, and suggestion selling

Fig 3.2.14 Mobile POS Device used by the customer at retail store to make payment

Exercise

1. What is the full form of POS?

a) Point of Sell
b) Priority to sale
c) Point of Sale
d) Pleased to sell

2. These are used to swipe credit /debit cards transactions or loyalty cards at POS.

a) EDC Terminals
b) Printer
c) Display Screen
d) Pole display

3. The _____ contains information about all the SKUs being offered for sale at the store.

a) Promotion Rules
b) Product Catalog
c) Access Control
d) Product management

Scan the QR codes or click on the link to watch the related videos

https://www.youtube.com/watch?v=2KTk8WMRFpE

Point-of-Sale (POS) systems

https://www.youtube.com/watch?v=Ta18d6JIO3o

Packaging and storage of food

https://www.youtube.com/watch?v=Hcl3v1d22CM

Storage of finished products

https://www.youtube.com/watch?v=iTNRv0IZacI

Different type of packaging

4 – Ensure upkeep of food products and related facilities

FICSI
Food Industry Capacity and Skill Initiative

Unit 4.1 – Maintain food products in retail stores and promotion sites

Unit 4.2 – Carry out facility maintenance

FIC/N9703

Key Learning Objectives

At the end of the module, the participant will be able to:

- Maintain food products in retail stores and promotion sites
- Carry out facility maintenance

Unit 4.1 – Maintain Food Products in retail stores and Promotion Sites

Unit Objectives

At the end of this unit, the participant will be able to:

1. Illustrate food quality and food safety standards
2. Illustrate food safety management systems
3. Explain the factors influencing the shelf life of a product
4. List the conditions required for safe storage for perishable foods

4.1.1 Food Quality and Food Safety

Food is a major determinant of the population's health, nutrition, and productivity.Thus, wholesome, safe food is essential to our health. Many diseases are spread by unhygienic food.

4.1.1.1 Food Safety

It is the assurance that food will not harm the consumer. By defining toxicity and hazard, food safety is better understood.

Toxicology is the ability of a substance to produce harm or injury of any kind under any conditions. Hazard refers to the likelihood of harm or injury if the substance is not used in the prescribed manner and quantity. Consumer health can be adversely affected by physical, chemical, and biological hazards.

Physical hazard is any physical material which is not usually found in food, which causes illness or injury and includes hair , stones, parts of pests, etc.

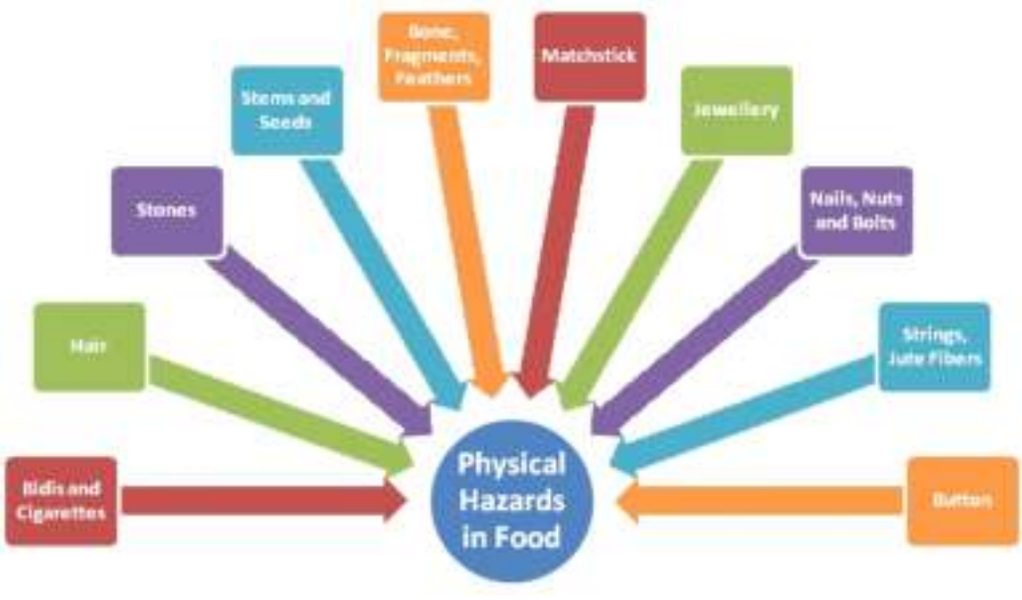

Fig 4.1.1 Physical Hazards in the Food

Fig 4.1.2 Invisible chemical hazards in food

- Chemical hazards: There are chemicals or deleterious substances that may be intentionally or unintentionally introduced into the food. The hazards in this category include pesticides, chemical residues, toxic metals, polychlorinated biphenyls, preservatives, food colours, etc.

Biological hazards include microbiological organisms and living organisms. Microorganisms that cause diseases when they are found in food are termed food-borne pathogens. Foodborne illnesses caused by microorganisms are divided into two categories: infections and poisoning.

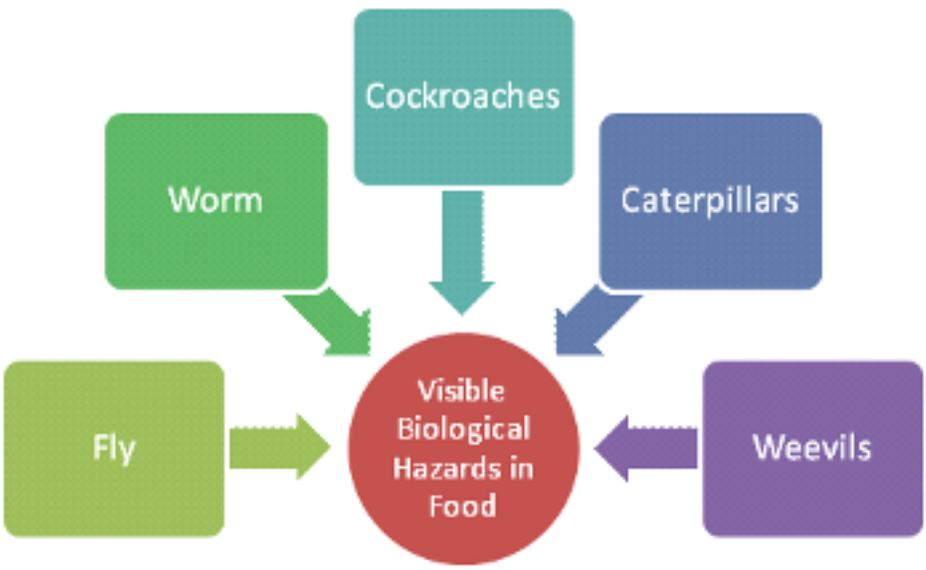

Fig 4.1.3 Visible biological hazards in food

- Food infection /Food Poisoning

Food poisoning/Food infection occurs when pathogenic bacteria are consumed and multiply in the body. Salmonella is a good example. Animals have this organism in their intestinal tracts. Sources include raw milk and eggs. Salmonella is destroyed by heat, but inadequate cooking allows some organisms to persist.

- Food intoxication:When food is cooked too hot or too cold, bacteria produce toxins. A toxic substance in food cannot be detected by senses of smell, sight, or taste. Thus, food that smells and looks good may not necessarily be healthy. The Staphylococcus aureus bacteria is one such example. These organisms can be found in the air, dust, or water. They are also found in the nasal cavity, throat, and on the skin, hair of 50 percent of healthy individuals. Those carrying this organism contaminate food if they touch these places on their bodies while handling food. Another symptom of this contamination is diarrhea.

As a result of various hazards, biological hazards are an important cause of food-borne illnesses. Despite all the efforts in food safety, there is still a serious concern over microbial foodborne pathogens, and new pathogens are continually emerging.

The terms contamination and adulteration are important to understand in food safety.

- Contamination means the presence of harmful, or objectionable foreign substances in food, such as chemicals, microorganisms, or dilutants.
- Adulteration: It is the deliberate or accidental addition of impure or cheap or unnecessary ingredient(s), to cheat, cheapen or falsify food or food preparation in a way that affects the properties and composition.

4.1.1.2 Food Quality

In the food industry, quality refers to aspects that affect a product's value to consumers.The list includes both negative attributes such as spoilage, contamination, adulteration, food safety hazards as well as positive attributes such as colour, flavor, and texture. In other words, it integrates nutritional traits, sensorial properties (color, texture, shape, appearance, taste, flavor, odor), social considerations, and safety.Quality and safety are preliminary attributes. Food standards are set across the world by different governments and international bodies that manufacturers/suppliers are expected to adhere to in order to ensure health and safety.

In order to ensure that food is safe and properly prepared, it is necessary for all food service providers (those engaged in pre-preparation and processing, packaging, and serving) to adhere to good manufacturing practices. Important point that needs to be considered are:

- Quality of water and raw materials
- Cleanliness and hygiene of the premises, equipment, personnel, food preparation and storage areas
- Appropriate temperature for food storage
- Food hygiene
- Good service practices.

4.1.2 Food Standards

It is essential to integrate quality into every aspect of food production and service to maintain effective food standards and control systems, ensure the supply of hygienic, wholesome food to facilitate trade within and between nations. There are four levels of standards which are well coordinated.

- Company Standards: These are prepared by a Company for its own use. Normally, they are copies of National Standards.
- National Standards: These are issued by the national standards body.
- Regional Standards: Regional groups with similar geographical, climate, etc. have legislation standardisation bodies.
- International Standards: The International Organisation for Standardisation (ISO) and Codex Alimentarius Commission (CAC) publish international standards.

4.1.2.1 Food Standards Regulations in India

The Prevention of Food Adulteration Act 1954 (PFA, 1954) was enacted by the Government of India to prevent adulteration of food. The Act has been amended as per need, numerous times (over 200 amendments). All food products manufactured in India, or imported and sold in India have to meet the requirements prescribed under this Act. In addition to PFA, there are other Orders or Acts that help to ensure quality of specific foods such as:

- Fruit and Vegetable Product Order: Specifications for fruit and vegetable products are laid down.
- Meat Food Products Order:In accordance with this order, meat processing is licensed.
- Vegetable Oil Products Order: Specifications for vanaspati, margarine and shortenings are laid down

Voluntary product certification

Various voluntary marking and grading schemes exist such as ISI mark/BLS and Agmark. Bureau of Indian Standards (BIS) works on standardizing various consumer goods, including food, and runs the ISI Mark program for processed foods. Agmark is a voluntary scheme of certification for raw and processed agricultural products (for consumer protection).

Since the government had several regulations and laws, food industry found it cumbersome. A need was therefore felt to integrate all such laws for regulating the quality of food. With this in view, Indian Government has passed Food Safety and Standards Act (FSSA), 2006, to bring the different pieces of legislation pertaining to food safety under one umbrella.

Food Safety and Standards Act (FSSA), 2006

The purpose of the Act is to consolidate the laws related to food. In India, the Food Safety and Standards Authority is mandated with laying down scientifically-based standards for food and with ensuring food safety and ensuring food availability. The Act has provisions for maintenance of hygienic conditions in and around manufacturing premises, assessment and management of risk factors to human healthin a scientific manner, which were not specified in the PFA. The FSSA reflects the international shift in food laws, from compositional standards or vertical standards to safety or horizontal standards.

4.1.2.2 International Organisations and Agreements in the Area of Food Standards, Quality, Research and Trade

Since ancient times, governing authorities the world over, have made attempts to develop and implement food standards in order to protect health of consumers and prevent dishonest practices in sale of food. There have been several international organisations and agreements which have played a role in enhancing food safety, quality and security, facilitating research and trade. The major organisations which are playing a key role are:

- Codex Alimentarius Commission (CAC)
- International Organisation for Standardisation
- World Trade Organisation

Codex Alimentarius Commission CAC

It is an intergovernmental body formed with the objective of establishing international standards to protect the health of the consumers and facilitate food and agricultural trade. In 2017, the membership of Codex was 187 member countries and one Member Organisation (European Community) respectively. India is a member through the Ministry of Health and Family Welfare. CAC has become the single most important international reference point for developments associated with food standards. The document published by the CAC is Codex Alimentarius which means 'Food Code' and is a collection of internationally adopted Food Standards. The document includes Standards, Codes of Practice, Guidelines and other recommendations in order to protect consumers and ensure fair practices in food trade. Different countries use Codex Standards to develop national standards.

International Organisation for Standardisation (ISO)

The International Organization for Standardization (ISO) is a worldwide, non-governmental federation of national standards bodies (ISO member bodies). The ISO promotes the development of standardization and related activities throughout the world with the aim to facilitate the international exchange of goods and services, and to develop cooperation in the spheres of intellectual, scientific, technological and economic activity. The work done by ISO results in international agreements which are published as International Standards.

ISO 9000 is an international reference for quality requirements. It is concerned with “Quality Management” of an organisation. Adoption of these standards is voluntary. The difference between Codex and ISO are given in the box given below:

Differences between Codex and ISO	
Used to develop national regulations	Voluntary
Slow to change	Standards are reviewed every five years
Describe the minimal acceptable practices	Describe current standard industrial practices.

World Trade Organisation (WTO)

- WTO was established in 1995. The main goal of World Trade Organization is to support trade flow freely, smoothly, fairly and predictably, by administering trade agreements, settling trade disputes, assisting countries in trade policy issues. The WTO Agreement covers goods, services and intellectual property.

In order to enforce adoption and implementation of standards, there is a need for a strong Food Control System. An effective food control system must consist of — (i) Food Inspection and (ii) Analytical capability

- **Food Inspection**: Conformity of products to standards is verified through inspection. This will ensure that all foods are produced, handled, processed, stored and distributed in compliance with regulations and legislation. Government / Municipal authorities appoint food inspectors to investigate the status of quality conformity to standards in their laboratories.
- **Analytical capability**: There is need for well-equipped, state-of-the-art accredited laboratories to carry out analysis of food. Further, well- trained personnel having knowledge of principles of laboratory management and physical, chemical and microbiological analysis of food, test foods and food products are also required. A broad range of analytical capabilities is required for detecting food contaminants, environmental chemicals, biotoxins, pathogenic bacteria, food-borne viruses and parasites.

4.1.2.1 Food Standards Regulations in India

Over the years, issues related to food safety and qualities have gone beyond just the avoidance of food-borne pathogens, chemical toxicants and other hazards. A food hazard can enter/come into the food at any stage of the food chain, so adequate controls must be maintained throughout. Food safety and quality can be ensured through:

- Good Manufacturing Practices (GMP) are a part of quality assurance to ensure that manufacturers/ processors take proactive steps to ensure that their products are safe. It enables to minimise or eliminate contamination and false labelling, thereby protecting the consumer from being misled and helping in purchasing products that are not harmful. GMP is a good business tool that helps to refine compliance and performance by the manufacturers/producers.

- Good Handling Practices (GHP) indicate a comprehensive approach from the farm to the store or consumer, in order to identify potential sources of risk and indicates what steps and procedures are taken to minimise the risk of contamination. It ensures that all persons who handle food have good hygiene practices.

- Hazard Analysis Critical Control Point (HACCP) is a means of providing assurance about safety of food. HACCP is an approach to food manufacture and storage in which raw materials and each individual step in a specific process are considered in detail and evaluated for its potential to contribute to the development of pathogenic microorganisms or other food hazards. It involves hazards identification, assessing the probability of occurrence of hazards during each step /stage in the food chain –procurement of raw materials, manufacturing, distribution, consumption of food products and defining measures for hazard(s) control.

4.1.3.1 How to minimize damaged, spoiled and expired food product inventory

Spoilage means products or production units that either fully or partially does not meet the intended specifications of the customers and are either discarded or sold at reduced prices. Spoilage is also synonymous with the spoiling of food and other perishable goods.

To minimize spoilage, one need to take a look at your processes across the entire supply chain. Packaging and distribution aspect are essentially important to focus, as this link in the chain is most under immediate control where changes can be made quickly.

Damage done in transit due to poor handling, or inadequate shelf life can be managed to a minimum. Over the years, packaging has advanced from merely providing protection to being able to ensure a longer shelf life for fresh produce as it makes its way from the farm to the wholesaler or processor. For example, Now reusable crates are used, which have specifically designed ventilation holes to ensure product longevity.

- Once the food products are in the warehouse/store, take care to:
- Ensure the refrigeration levels are always correct. Install sensors which trigger alerts when levels get low to an unstable level.
- Check for expiration dates and if they are about to expire. Donate or sell them at discounted price rather than throwing them out.
- Ensure that the pallets are functional and are in good condition. There should be no broken or faulty parts in the pallets.
- Ensure staff is trained on loading and wrapping of the pallets with zero damage to the product.
- Check for lighting in the warehouse to avoid any errors in picking, packing, and product handling.
- Check for cleanliness of the warehouse. It should be uncluttered and have plenty of space for the movement of forklifts without bumping into inventory and causing damage.
- Ensure that the shelves aren't overloaded. Know what the shelf capacities are and post this on the storage unit.
- Ensure you have the necessary safety equipment. Rack netting, for example, is used to prevent boxes from falling and breaking open while also preventing staff injuries.
- Ensure that workstations are set to the correct height so that employees don't have to operate at angles that cause discomfort – this will avoid product being dropped, crushed, or spilled.

4.1.4 What is Shelf Life?

Shelf life is a guide for the consumer about the time period that food can be kept before it starts to deteriorate, provided any specific storage conditions have been followed. The shelf life of a product begins from the time the food is prepared or manufactured. Shelf life is dependent on many factors such as, manufacturing process, types of ingredients, type of packaging and storage of food. It is indicated by labelling the product with a date mark.

4.1.4.1 Factors influencing the shelf life of a product

All foods gets spoiled with time, but there is considerable variation in spoilage rates. Some of the factors involved in loss of quality are explained below:

- Microbial Growth

Bacteria, yeasts and moulds in food may spoil the food or cause food poisoning. The time taken for microorganisms to affect foods will depend on their levels in the food when it is produced, as well as any further contamination the food may suffer during packing, storage and other handling. The temperature and time of storage, as well as the type of food, are also important considerations. Usually, moist food spoils faster than dry food.

- Non – Microbial Spoilage

There are many other ways in which quality and nutrients can be lost. They may not necessarily result in the product being harmful but can mean that it is no longer of an acceptable standard.

- Moisture gain/loss can result in loss of nutrients, browning and rancidity. Dry foods can become vulnerable to microbial spoilage if they take on moisture.
- Chemical change can result in off flavours, colour changes, browning and loss of nutrients.
- Light induced change can cause rancidity, vitamin loss and fading of natural colours.
- Temperature changes increase or decrease the speed of other forms of spoilage.
- The physical damage to food can result in spoilage, for example, bruised fruits and vegetables.A damaged food package can expose the food to bacterial and non-bacterial spoilage. Pin holes in cans or tears in plastic bags, for example, allow microorganisms to enter food and moisture to escape.
- Other
- Spoilage by rodents and insects
- Flavours and odours from storing food near other strongly smelling products
- Product tampering

4.1.5 Safe Storage for Perishable Foods

It is important for a grocery store operation to have clearly defined storage areas and procedures for several reasons. First, by providing storage facilities, it is possible to purchase supplies in large enough quantities for price breaks. Secondly, storing supplies on site reduces the need for ordering supplies and handling them upon delivery.

Perishable food items must be stored properly to remain fresh and keep germs from multiplying. Fruits, vegetables, dairy products, eggs, meat, poultry, and seafood are perishable foods.

1. Dry Foods

The dry foods storeroom should always be near the receiving area and close to the main kitchen. Unfortunately, the storeroom for dry foods is often an afterthought in food service facility designs, and the area designated for storage is sometimes in an inconvenient location.

Irrespective of the location, there are several essential points to be observed in the care and control of the dry storeroom.

- The dry and cool area will prevent spoilage and the swelling of canned goods. The ideal temperature range is 10°C to 15°C (50°F to 59°F).
- It should be easy to keep the storeroom clean and vermin-free. For this reason, all openings in walls, ceilings, and floors should be sealed and protected.

- It should be designed so it is easy to arrange and rearrange supplies to facilitate stock rotation. The best arrangement is to have shelves situated in the middle of the room so they can be stocked from both sides. This allows you to rotate stock by simply pushing out old stock by sliding new stock in from the other side of the shelf. This guarantees that first items received will be the first items used, or the "first in, first out" (FIFO) concept in stock rotation.
- The area should be well lit.
- Shelving must be at least 15 cm (6 in.) above the floor. Do not store items right on the floor.
- Aisles should be wide enough to allow room for carts or dollies, which should be used to prevent possible injuries from lifting.
- Food and supply storage areas must be secured under lock and key to prevent theft. In order to control food costs, food storage control is a critical step. All storerooms should be regarded as bank safes where the assets of the operation are kept. Consequently, valuable commodities such as liquor and wine may need to be locked up inside a larger storage area, such as the dry food storage area.

2. Refrigerated Products

The refrigerator, whether an upright or a walk-in, is a key component of food storage planning. Foods that are fresh or perishable need to be kept in the refrigerator to prevent them from deteriorating and decomposing. There is a rule that must always be observed: storage of raw products should not be above that of cooked or prepared foods.

Critical Control Point

Keep foods 4°C (39°F) or colder, the safe temperature for refrigerated storage.

Here are some considerations to ensure that the refrigerator does not break down and risk spoiling food:

- The refrigerator should be monitored daily. Every refrigerator should be equipped with a thermometer so that daily readings can be taken.
- Keep refrigerators in good working order. Maintain a regular servicing contract with a local refrigerator repair company.
- It's usually beyond the ability of store staff to fix a refrigerator that stops running, but if it's happening check to make sure the power supply cord wasn't pulled out or the breaker flipped.
- Clean refrigerators regularly. Shelves should be shallow and well vented to make such cleaning quick and easy. Develop and follow a schedule to ensure that refrigerators are cleaned on a consistent basis.

There are also several general rules that all personnel using the refrigerator should follow:

- Store raw products below cooked or ready-to-eat products.
- Develop and follow a FIFO system for refrigerated food.
- Make specific areas in the refrigerator for certain items, and store each item in its designated spot.
- Never put hot foods in the refrigerator unless absolutely necessary. (Unfortunately, one person's understanding of "necessary" may not be the same as another person's, so consider developing guidelines.)
- Never leave the refrigerator door open longer than needed.

3. Dairy Products

Dairy products must be stored in the refrigerator at temperatures of 2°C to 4°C (36° to 39°F). Follow these guidelines:

- Dairy products have a strong tendency to absorb smells from storage environments due to their fat content. Store dairy products in their own area with protective coverings to reduce the risk of contamination.
- Do not store dairy products in a vegetable cooler; a separate refrigerator is much more acceptable.
- Keep the refrigerator clean at all times.
- Rotate dairy products as soon as they arrive. Don't order dairy products too far ahead of time. Such products should be delivered on a daily basis.

4. Produce

Most produce is stored in the refrigerator at 2° to 4°C (36° to 39°F) to ensure freshness and to prevent rapid deterioration. There are, however, a number of exceptions, including potatoes and bananas, which should be stored at higher temperatures.

Keep these factors in mind when storing produce:

- Soft fruits should not be stored too long. It is often best to buy soft fruit as you need it, keeping very little on hand.
- Unripe fruit can be ripened at storeroom temperatures of 10°C to 15°C (50°F to 59°F). It willripen much more slowly under refrigerator conditions.
- It is important to remove rotting fruit from cases before storing and rotating stock, as one piece can affect the rest. The chain reaction can destroy the quality of an entire case of fruit quickly.
- Be aware of special storage problems. For example, bananas stored in the refrigerator turn black quickly. Bananas should be stored under conditions where the temperature range is 10°C to 15°C (50°F to 59°F).
- The storage time for produce varies widely. Hardy vegetables such as carrots and cabbage will last for weeks, whereas delicate vegetables such as lettuce should be bought as fresh as possible because they will not keep for long.
- Moisture on vegetables tends to soften them, causing rot. Even though in the early stages of rot there is nothing basically wrong with such vegetables, they can be unattractive to the eye.

5. Fresh Meats, Poultry, and Seafood

These items are the most difficult to store and the most expensive food items sold by the restaurant. When storing meats, poultry, and seafood items, remember the critical control point.

Critical Control Point

Keep foods 4°C (39°F) or colder, the safe temperature for r efrigerated storage.

Keep these factors in mind when storing fresh meats, poultry, and produce:

- All carcass meats should be unwrapped and hung so that air can circulate around them. They should be stored at 1°C to 3°C (34°C to 37°F) in a walk-in refrigerator. Place absorbent paper under the meats for quick cleanup of any unwanted drips.
- Fresh meat must not be kept too long. Boned meat should be kept no longer than three days. Individual cuts should be used within two days, preferably on the day they are cut.
- Individual meat cuts such as steaks, chops, stewing meat, and ground meat should be kept covered on plastic or stainless steel trays at 2°C to 4°C (36°F to 39°F).
- Fresh poultry should be packed in ice and stored in the refrigerator.
- Fresh seafood should be packed in ice, stored at −1°C to 2°C (30°C to 34°F) and used as soon as possible.
- Store raw products on the lower shelves of the refrigerator, below cooked products.

6. Frozen Foods

When storing frozen food, keep it at a temperature below –18°C (0°F). Temperatures above –18°C can cause food to become discolored and lose vitamins. After the temperature has risen, lowering it does not fix the damage

Critical Control Point

Frozen food must be kept at −18°C or lower to maintain its quality.

Keep these factors in mind when storing frozen foods:

- Fruit and vegetables that are received frozen will keep for months if they are properly wrapped. Fish and meat properly wrapped also have a relatively long freezer shelf life.
- Freezing fresh fruits and vegetables on the premises is time consuming and may be too expensive to consider. Fresh fruit must be properly prepared for freezing or it will not store well.
- When frozen foods are not properly packaged, they develop freezer burn, a loss of moisture that adversely affects both the texture and the taste of the food. An area of white or grey dryness appears on the frozen product when it suffers freezer burn. Freezer burn occurs particularly frequently with meat.
- A rotating stock is essential for frozen foods. With standard chest freezers, such rotation is difficult since old stock has to be removed before new stock can be added. There is a temptation to develop the undesirable habit of buying frozen foods in reverse order of buy, rather than FIFO (first in, first out).

Exercise

1. _____are deleterious substances which may be intentionally or un-intentionally added to foods.

2. _____results from ingestion of live pathogenic organisms which multiply in the body and cause disease.

3. The shelf life of a product begins from the time the food is prepared or manufactured. (T/F)

4. A substance intentionally added that affects the nature and quality of food is called _____
a) Food poison
b) Food adulterant
c) Food contaminant
d) Food material

5. The _____ was enacted by the Government of India to prevent adulteration of food.
a) Prevention of Food Adulteration Act
b) Protection of Food contamination Act
c) Prevention of Food Act
d) Food Prevention and Protection Act

6. Which of the following is an example of biological hazard?
a) Salmonella
b) Antibiotics
c) Cleaners
d) Dirt

6. It is an intergovernmental body formed with the objective of establishing international standards to protect the health of the consumers and facilitate food and agricultural trade.
a) International Organisation for food
b) World Health Organisation
c) Codex Alimentarius Commission (CAC)
d) Food trade organization

7. Methods for detection of common adulterants are _____
a) Visual tests
b) Chemical tests
c) Physical tests
d) All of the mentioned

8. These are a part of quality assurance to ensure that manufacturers/ processors take proactive steps to ensure that their products are safe.
a) Good Manufacturing Practices (GMP)
b) Good Handling Practices (GHP)
c) Hazard Analysis
d)Food Safety Management

9. What is the Critical Control Point of Fresh Meats, Poultry, and Seafood?
a) 4°C c) 30°C
b) 10°C d) -4°C

Unit 4.2 – Carry out facility maintenance

Unit Objectives

At the end of this unit, the participant will be able to:

1. Identify the process of store cleaning
2. Demonstrate the cleaning process for POS and other hardware
3. List the various types of pest control devices required for upkeep of stored food products.

4.2.1 Store Cleaning

Places where, there is a lot of human traffic, a considerable amount of hand and surface contact is there, sensitive items like food, drinks, and consumables are present, must be cleaned thoroughly and regularly.

Customers expect a clean and organized shopping environment when they come to pick up their groceries. They want to see dust- and spot-free surfaces, not smell any unpleasant odors, and walk on dry, debris-free floors.

Following a cleaning checklist is critical for grocery stores during the coronavirus pandemic
Grocery stores are very important, implementing safety habits and creating a checklist that all grocery store employees are trained to follow can make everyone feel safer and more confident.

What are the risks of neglecting proper cleaning procedures during a pandemic?
As we all know that the risk of COVID-19 exposure is higher in interior public spaces, according to the most recent studies, and this novel virus is also highly contagious. Since the virus can spread in several ways, it's important to keep the stores clean and ensure other employees are following steps to avoid the spread of the virus as much as possible.

How often should a grocery store be cleaned?
Normal routine cleaning with soap and water alone can reduce risk of exposure and is a necessary step before you disinfect dirty surfaces.

Surfaces frequently touched by multiple people, such as door handles, displays, POS terminals, handheld scanners, refrigerator case handles, shelves and other surfaces should be regularly cleaned and disinfected, ideally more than once a day.More frequent cleaning and disinfection may be required based on level of use. It's also a good idea for cashiers and associates to wipe down the POS keypad and other surfaces near the register after every use.

4.2.1.1 Store Cleaning Checklist

- **Glass doors and windows:** The front windows of the store as well as the ones in the freezer and fridge display cases should be cleaned and disinfected on a daily basis. Handles and areas that are handled frequently also need special attention. Be sure to clean both the interior and exterior of the doors when necessary.
- **Bins:** Grocery store's bins should be monitored and emptied frequently to prevent unpleasant odors, bugs, and debris from collecting on the ground. A schedule of checking these cans throughout

the day is a must when you want a safe shopping environment.

- **Floors:** Floors with debris and moisture can cause falls and injuries. In order to keep the floors safe and looking their best, it is essential to monitor and clean the floors throughout the store, in the restrooms and staff break rooms, and in the entrances and hallways. To keep this surface clean and attractive, mop, sweep, and vacuum often.
- **Restrooms:** A clean restroom area is loved by everyone. It is important to include this in the regular daily cleaning schedule. Ensure this space is disinfected and sanitized to reduce or eliminate germs and contaminants, as well as odors. You should also be checking your restrooms throughout the day to ensure they are clean, and that trash and moisture are removed from the floors.
- **Organizing food and merchandise:** The appearance of the store is improved by keeping it organized and well-kept. This gives your customers a pleasant experience as they find the items they are looking for. A product review can also take place, as well as keeping damaged or expired items off the shelves and displays before they become unattractive.
- **Shopping carts:** Have employees monitor shopping carts for forgotten food items, trash like shopping lists and coupons, and any broken or damaged parts. Hand wipes at your entrance can be a convenient way for customers to disinfect their shopping carts.

4.2.1.2 Cleaning POS and other hardware

1. Touch screens

Touch screens can be effectively cleaned with diluted detergent or up to 70% isopropyl alcohol solution. Follow the cleaning instructions below to prevent damage to your touchscreen:

- **Clean the screen** using a non-abrasive cloth and a diluted detergent solution, such as household soap and water. Do not apply any cleaning products directly to the screen and do not soak the cloth: wring it out before using.
- **Dry the screen** with another soft cloth.
- **The screen can then be further cleaned by** dampening a cloth with isopropyl alcohol solution, or using pre-packaged wipes, to wipe the screen. Do not apply any cleaning products directly to the screen and do not soak the cloth: wring it out before use.

2. Plastic & metal surfaces

Cleaning plastic and metal surfaces of the POS or self-checkout with soap, water and bleach solution.

Note: Bleach can damage clothing.

4.2.2 Pests in food retail

The Food Retail sector faces threats from pests from multiple sources. A large store may stock thousands of products from multiple sources with complex supply chains, requiring efficient monitoring and control procedures.

Food handling activities range from raw meat and fish preparation, fresh dairy products, freshly cooked foods and bakery products, fresh fruit and vegetables, in addition to packaged goods. It is important for businesses of all sizes to maintain sanitation standards and actively prevent pest infestation.

The presence of pests can cause enormous economic loss to the business owner, staff and suppliers.

The potential consequences of failure to maintain standards for the Food Retail sector include:

- damage to reputation and customer trust;

- lost sales and profits due to loss of customers;
- financial loss from cost of replacing damaged products;
- financial loss from claims for compensation;
- prosecution by public health and regulatory authorities;
- financial loss from fines from authorities;
- closure of the business by regulatory authorities or public health authorities.

The major pests affecting the Food Retail sector include rodents, flies, cockroaches, stored product insects, birds , ants .

4.2.2.1 Rodents

- Rats and mice are attracted to food sources but do not venture far from their nesting sites or shelters, so they will nest close to food sources.
- They are capable of a rapid increase in population given an abundant food supply, shelter from predators and benign environmental conditions inside a building.

The threats from rats and mice include

- There are many problems with buildings and fixtures, including damage to electrical equipment and the brown rat can damage sewer lines;
- damage to machinery;
- contamination along access routes with urine, droppings, and filth picked up from the environment;
- damage to food containers and packaging;
- eating food in storage and on display;
- contamination of food with droppings, urine, filth;
- transmission of diseases, including Salmonellosis, Leptospirosis, Toxoplasmosis, Lyme disease, rat-bite fever;
- rodents carry ectoparasites, including ticks, fleas, lice and mites and are therefore also vectors for the diseases that these carry;
- rodents are reservoirs for some mosquito-borne diseases.

Signs of rodents

Rats and mice have distinct but different signatures that show which pest is present:

- droppings, which have a distinctive size and shape for each species;
- sightings of live or dead animals;
- noises: squeeks, gnawing sounds, scurrying sounds;
- smudge marks along runs caused by their oily fur;
- tracks in dust or powder used for the purpose;
- gnawing of building materials, wiring, food and packaging: the gnaw marks are distinctive;
- urine stains are left by both rats and mice and can be detected using UV light;
- urine pillars form where mice infest an area over a long period — and would show a serious failure in pest control.

Rodent control

Rodent control involves the elimination of rodent harborages in and around buildings and preventing access to food, water and shelter. A building may have many points of entry such as cracks, vents, pipes, cables, drains, doors, and windows, where preventive measures can be taken. Any rodents present must be controlled using traps or poison according to acceptable practices and legislation related to food safety.

Use of rodenticides
Rodenticides need to be of approved composition, placed in bait stations securely and restricted to areas where no food is processed. They must also be stored in conditions that prevent contamination of food products and the environment if they are stored on site.

Expertise is needed to determine the type of bait used, where it should be placed and the frequency, the monitoring regime and the documentation, which is best done using an outside contractor.If done in-house, staff will need to be certified to handle the chemicals and carry out the rodent control activities.

4.2.2.2 Flies

A number of fly species are attracted to food odours present in grocery stores, including fruit flies, drain flies and house flies. For pest control it is important to identify which species is present as each has different attractants and breeding habits.

Fig 4.2.1 Flies

1. Fruit flies
Fruit flies are attracted to fermenting sugary liquids, in which they can feed and breed at very low rates. The liquid can accumulate in:

- garbage containers;
- over-ripe fruit, and some vegetables;
- old drink bottles;
- in drains;
- in spills;
- in cracks in wet floors.

2. Drain flies
The drainage flies are attracted to organic waste of all kinds, including rotting food, sewage and others. These insects lay their eggs in organic waste that accumulates in drains and polluted shallow water. They breed in the gelatinous bacterial films - biofilms - that form on surfaces in drains, septic tanks, compost piles, etc. They are resistant to cleaning and pest-control chemicals.

3. Risk from flies
Fresh foods in grocery stores and supermarkets can be contaminated by flies. When breeding conditions are warm with suitable 'substrate', flies have a short life cycle and multiply rapidly. If hygienic practices are not followed, waste storage areas and drains around stores can provide an attractive array of suitable conditions for flies.

Areas around stores, especially waste storage and drains, can provide an attractive array of suitable conditions for flies, if hygienic practices are not adequate.

Disease
pathogens that can cause disease in humans, including Salmonella, cholera, Shigella, Campylobacter, E. coli, Cryptosporidium, parasitic worms and fungi.

- Flies feed on faecal matter, garbage, rotting materials as well as stored and processed foods in food processing plants.
- They will regularly move between the contaminated food sources and clean areas, carrying contaminated filth on their bodies as well as microorganisms internally.
- Flies pick up contaminated material as they feed, in their mouth parts and on their bodies.
- Also flies such as house flies regurgitate digestive juices and defecate while feeding and resting, contaminating foods and surfaces with microorganisms that can cause disease or decay.

The health risks associated with fruit flies are not as high as those associated with other flies because they are not considered filth feeders. Females, however, feed on animal faeces to obtain protein for egg laying, therefore they can transmit diseases as well as spoilage microorganisms.

Controlling flies
Standard hygiene practices are particularly important for reducing flies' attraction to odours, feeding places, and breeding areas. These include:
- supplies are not brought in or stored in a rotting state;
- food preparation areas and equipment are cleaned and inspected regularly, including in cracks, crevices and hidden spaces where traces of food and liquid can accumulate;
- garbage is disposed of regularly — at least twice a week in hotter climates;
- garbage containers are cleaned, not overflowing and can shut properly;
- all equipment used to handle garbage is cleaned regularly;
- there is sufficient storage volume for the waste produced;
- the areas where garbage is stored are kept clean and well maintained;
- supply areas and vehicles where spills can accumulate and decay are kept clean;
- the same hygienic practices are applied to canteen and kitchen areas;
- drains are kept free of accumulating organic matter and cleaned with appropriate cleaner.

Exclusion is determined by the design and maintenance of the facility, including:
- use of screens on windows and vents, maintained in good condition;
- appropriate door design for the purpose eg. automatic doors, air curtains, roll-up doors; vinyl strip doors;
- doors are kept shut when not in use;
- Maintenance is performed to prevent any gaps that might allow insects into the building;
- UV light traps and pheromone traps can be used to trap flies to help prevent build-up of breeding populations.

Elimination
As a last resort pesticide is applied using approved products for use in food premises applied by trained personnel (pest controller / exterminator) following accepted practices.

4.2.2.3 Cockroaches

The ability of cockroaches to hide in small places, their varied diet, rapid reproduction, and the diseases they carry make them particularly problematic for businesses handling food.

Cockroaches are primarily nocturnal, sheltering in the daytime and coming out at night to find food and other sites for shelter. They can shelter in shelving in food stores, dark places such as cracks and crevices in walls and floors, drains, sewers, inside equipment and machinery and hidden spaces that provide the right temperature and humidity. These places are also hard to reach using normal cleaning and sanitation methods.

Fig 4.2.2 Cockroaches

Risks from cockroaches

- Diseases and allergens: cockroaches can carry a large number of disease-causing bacteria, including Salmonella, Staphylococcus, Listeria, E. coli, and also fungi, viruses and parasitic worms;
- feeding on decayed matter, mould, faecal matter in sewers, and animal carcasses, these organisms can transmit pathogens into areas where food is produced, stored and displayed.
- they defecate along their pathways;
- they frequently expel saliva on surfaces to 'taste' their environment;
- droppings and bodily secretions stain and leave a foul odour that can permeate infestation areas, food and packaging;
- cast skins and egg cases contaminate products and packaging;
- droppings and shed skins contain allergens, and heavy populations of cockroaches may trigger asthma attacks. Cleansing of residual allergens after cockroach treatment will remove them.

Cockroach prevention

Good sanitation practices will help prevent infestations and pick up the presence of cockroaches:

- A cockroach can feed on small amounts of food residue left from spills or in preparation areas, so good cleaning methods will eliminate the residues quickly;
- In food production areas, store food in cockroach-proof containers: they eat cardboard and paper so this should not be used for storage;
- A good inspection regime for equipment, buildings, and incoming goods, stored and displayed products will pick up infestations and identify risks quickly.
- Maintain drains in good condition to prevent accumulation of food debris and means of access and shelter;
- Waste is removed from food production areas, garbage containers are designed to prevent pest access, garbage containers are positioned away from storage and production areas, and trash bins are cleaned and emptied regularly to reduce risks of infestation;
- Good building design can reduce the risk of access e.g., through spaces around pipe and cable ways, vents, screens, windows, doorways, sewers; and harbourage in small spaces such as junction boxes.

Cockroach control

For the control of cockroaches, a variety of treatments are available, including sprays, aerosols, dusts, and baits. In food handling facilities, the insecticides used will need to be approved for use by the relevant authority and will require competent, trained personnel to use them.

4.2.2.4 Stored Product Insects

Stored product insects (SPIs) are a variety of beetles, weevils, moths, and mites (which are arachnids) that infest food in storage anywhere along the food supply chain. Pests in food ingredients are likely to be present on delivery to a retail store or in a processed food product if it is stored for a long time. Dry food products tend to attract pests.

Fig 4.2.3 Insects

These include food items like, seeds, cereal products, nuts, dried fruit, powdered milk, tea and preserved meats. All stages of the pest can be present simultaneously, eg egg, larva, pupa, adult.SPIs can also enter packaging made of paper, cardboard, plastic, cellophane and foil. The entrance holes of some insects are smaller than can be seen by the human eye. For example, the larva of the Indian meal moth, therefore packaging without visible damage may harbour insect pests inside.

Insects and mites may only consume a small quantity of food but can contaminate large quantities through physical damage, cocoons, faeces and the introduction of microorganisms that cause further degradation, making food unfit for human consumption. The pest attack in raw product ingredients can also alter their physical and chemical properties, causing them to cake during processing.

Signs of stored product pests include:

- Storage products are damaged, such as nuts or grains that have little holes in them;
- live or dead insects (small beetles and moths), larvae, pupae or silken webbing on food storage bins;
- infestation, holes, larvae or webbing on the outside of packets or bags;
- larvae, pupae, or silken webbing in food harborages around shelves or machine
- larvae, pupae or silken webbing in food spillages;
- larvae, pupae or silken webbing on beams and window sills;
- Insect traps catch pests.

Common stored product pests and the foods they infest

1. Moths

- Indian meal moth: nuts, dried fruit and grain.
- Mill moth: flour.

- Indian meal moth: nuts, dried fruit and grain.
- Mill moth: flour.
- Tropical warehouse moth: stored cereal, nuts, dried fruit, oil seeds and oil cakes.
- Warehouse moth: dried fruit and nuts, chocolate confectionery, chocolate beans.

2. Beetles & weevils

- A large number of species of beetle and weevil feed on dried foods such as: cereals/grains, flour, seeds, nuts, pulses, dried fruit, chocolate, spices, and processed foods including pasta.

3. Mites

- Cheese mite: cheese, nuts, dried eggs, fruit, flour, tobacco.
- Flour or grain mites: cereals, dried vegetable materials, cheese, corn and dried fruits.

4.2.2.5 Ants

Ants are more of a nuisance pest than a food safety issue in grocery stores. They can find their way to food sources in buildings through the smallest gaps. They may infest fresh foods, food preparation areas, shelving, packaged foods — damaging both the packaging and the food inside — and in waste storage areas.

Fig 4.2.4 Ants

While ants do not transmit disease, they can pick up disease-causing organisms through mechanical contamination when they walk on contaminated surfaces or substances. More than 12,000 species of ants inhabit a wide range of habitats. In general, they are opportunistic feeders and will forage for whatever food source is available. Some prefer sweet foods, while others use protein sources or fresh leaves to cultivate fungi as food in their nests.

Businesses losses from ants

- **Wasted food:** The food contaminated with ants must be discarded.
- **Reputational damage:** If ants are found in a store or on products purchased by customers, there will be negative publicity and possible food safety notices or prosecutions;
- **Economic loss:** the costs involved with wasting food and disposing of it, returning goods, reputational damage, and food safety orders and prosecutions

Exercise

1. What are some economic loss that are caused by presence of pests in a food retail outlet?

_____
_____
_____
_____
_____
_____
_____
_____
_____

2. The potential consequences of failure to maintain standards for the Food Retail sector include all of the following, except:

a) damage to reputation and customer trust
b) increased sales and profits due to loss of customers
c) financial loss from cost of replacing damaged products
d) financial loss from claims for compensation

3. Rats and mice have distinct but different signatures that show which pest is present, that includes:

a) droppings, which have a distinctive size and shape for each species;
b) sightings of live or dead animals;
c) noises: squeeks, gnawing sounds, scurrying sounds;
d) All of the following

Scan the QR codes or click on the link to watch the related videos

https://www.youtube.com/watch?v=M44fARmrD6M	https://www.youtube.com/watch?v=HesWbNFSQS4	https://www.youtube.com/watch?v=daNjRoP_I0c&t=87s
Future opportunities for a Food Sales Promoter	Documentation and record keeping	Health and safety practices at workplace

Notes

NCVET

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FICSI
Food Industry Capacity and Skill Initiative

5. Ensuring Food Safety and Personal Hygiene

Unit 5.1 - Introduction to Food Safety

Unit 5.2 - Schedule IV requirements of FSSAI

Unit 5.3 - Personal Hygiene

Unit 5.4 - Health Safety

FIC/N9901

Key Learning Outcomes

By the end of this module, the participants will be able to:

1. Identify the hazards, types of hazards (Physical, chemical, biological and Allergenic) and risks at workplace
2. HACCP , TACCP, VACCP , Control measures , CCP, Critical limit
3. Explain the preventions of product contamination
4. Discuss the factors affecting food spoilage and food storage techniques
5. Describe Schedule IV requirements of FSSAI
6. Discuss cleaning and sanitization process, needs and importance and storage of sanitizing materials
7. Discuss health and safety policies and procedures
8. Discuss Employee health do's and don'ts, Food borne illness and preventive health checkups

UNIT 5.1: Introduction to Food Safety

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify types of hazards and risks at work place

5.1.1 Food Safety

Food safety refers to routines in the preparation, handling and storage of food meant to prevent food borne illness and making food safe for human consumption. Safe food handling practices and procedures are thus implemented at every stage of the food production life cycle in order to curb these risks and prevent harm to consumers.

5.1.2 Food Safety Hazard and Risk

Hazard is a factor or agent which may lead to undesirable effects like illness or injury in the absence of its control, whereas, risk refers to the probability that the effect will occur.

Hazard is that part of food which somehow entered in the food and which is non-consumable.

Types of hazards and risks at work place

There are two types of hazards: one is food safety hazard and second is health safety hazards.

Food Safety Hazard

There are four major hazards that may be introduced into the food supply any time during harvesting, processing, transporting, preparing, storing and serving food. These hazards may be microbiological, chemical, physical and allergens.

Microbiological hazards

When harmful microorganisms are found or grown on food it is called microbiological hazards. Food which contains harmful or pathogenic bacteria when eaten can make people ill.

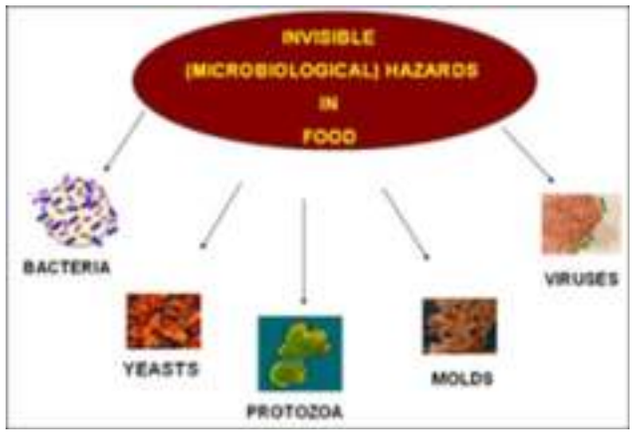

Fig. 5.1.1: Microbiological Hazards

Food spoilage and deterioration is no accident. It is a naturally occurring process. To understand how to maintain the quality of food and prevent spoilage, we need to know what can cause it.

Food spoilage: The microorganisms that can cause food-borne illness are called pathogenic microorganisms. These microorganisms grow best at room temperatures (25-30°C), but most do not grow well at refrigerator or freezer temperatures. Pathogenic microorganisms may grow in foods without any noticeable change in odor, appearance or taste. Spoilage microorganisms, including some kinds of bacteria, yeasts and molds, can grow well at temperatures as low as 4°C. When spoilage microorganisms are present, the food usually looks and/or smells awful.

Fig. 1.1.2: Food Spoilage

FAT TOM- This is a term used commonly in food industry to describe the six favorable conditions required for the growth of the food borne pathogens/micro-organisms.

Fig. 1.1.3: FATTOM Food Safety

Physical Hazards

These include any foreign material, which you would not expect to find in your food. Hair, finger nails, pieces of wood, metal, plastic, glass and insect debris are examples of what can find their way into food as foreign matters.

Fig. 5.1.4: Physical Hazards

Chemical Hazards

Chemical hazards include, food contact materials, cleaning agents, pest control substances, contaminants (environmental, agricultural and process e.g. acrylamide), pesticides, biocides and food additives. They are naturally occurring, intentionally added or unintentionally added.

- Preservatives
- Colours and dyes
- Flavour enhancers
- Water additives
- Packaging materials
- Processing aids

Allergen

An allergen is any protein that is capable of producing an abnormal immune response in sensitive segments of the population.

A known component of food which causes physiological reactions due to an immunological response (e.g.- nuts, gluten, egg, ,milk etc, identified in legislation relevant to country of production or sale)

Fig. 5.1.5: Allergens

It is important to be aware of food allergens in food industry as this is the risk associated with the unintended presence of allergen due to cross contamination and should take this a matter of serious concern. Food allergies can cause serious and even deadly reactions.

What Are the Most Common Food Allergens?

There appears to be eight common allergens accounting for most food allergic reactions. They stand to be- milk, eggs, peanuts, soya, wheat, tree nuts (like walnuts and cashews), fish and shelfish (such as shrimp).

What Are the Signs & Symptoms of a Food Allergy?

The common sign and symptoms are: trouble breathing; coughing; hoarseness; throat tightness' belly pain' vomiting' diarrhe' itchy, wateru, or swollen eyes; red spots; swelling, a dropi in blood pressure and is capable of happening because a person can't digest a substance, such as lactose.

Handling of Allergenic Foods:

The common sign and symptoms are: trouble breathing; coughing; hoarseness; throat tightness' belly pain' vomiting' diarrhe' itchy, wateru, or swollen eyes; red spots; swelling, a dropi in blood pressure and is capable of happening because a person can't digest a substance, such as lactose.

5.1.3 Contamination, Cross Contamination and Prevention

Contamination: The presence of unwanted materials such as dust and particles during the manufacturing and transportation time is called contamination. The term contaminants include any unwanted matter that is found in the product. These contaminants affect the quality of the product or the process.

The most common types of contaminant include:

- Physical contaminant Examples: fiber material, particles, chips from your pill press tooling.
- Chemical contaminant. Examples: vapor, pesticides, grease. detergents, and so on.
- Biological contaminant Examples: fungus, bacteria, virus.

Cross contamination is possible when the unwanted matter is introduced or brought from one process to the next during manufacturing.

A leak in the holding containment would contaminate the product inside it; this would be an example of physical contamination.

Certain metals standing to be more advantageous to health, like iron, appearing to be globally added to some foods, involving infant formulas as well as breakfast cereals, to highlight their dietary advantages.

For biological contamination, bacteria may thrive if the container is not properly cleaned and dried. The contaminated container will then affect the product and microbes may thus be introduced to the batch.

Prevention of Contamination:

- Determine the cause of the contamination
- Anticipate the effect
- Eliminate the source material

- To remove the contaminant carrier:
  - Reduce human involvement
  - Regulate the use of the equipment
  - Regulate the use of air
  - Regulate the use of water
- To reduce human carrier risk:
  - Ensure that proper attire is worn when coming and going from the production area
  - People frequently touch their eyes, nose, and mouth without even realizing it. Germs can get into the food through their contaminated unwashed hands.
- To reduce water as carrier:
  - As water is the number one source for cross contamination, it is important to reduce and prevent water contamination
  - Water borne contaminants: particulates (such as minerals) and pathogens (e. coli, salmonella, etc.)
  - Use of preventive measure such as filtration devices, distillation or reverse osmosis, UV treatments
- To reduce air as carrier:
  - Control air flow through AHUs (Air Handling Unit)
  - Use of air locks
  - Installation of HEPA (High Efficiency Particulate Absorbing Filters) filters
  - Ultra-Low Particulate Air

5.1.4 Storage (Importance of Storing Food at Specified Temperature)

Storage temperature is one of the most important factors in the preservation of food because microorganisms have been found to grow in almost all temperature.

Food storage is a major issue when keeping food safe. Food which is not correctly stored can spoil or become contaminated, which can make people sick. There are very specific rules regarding the temperatures that food must be stored at, cooked to and reheated to and if not followed, the risk of becoming ill as a result of contamination increases.

Room Temperature Food Storage

Keep dry storage areas clean with good ventilation to control humidity and prevent the growth of mold and bacteria. 21°C is adequate for dry storage of most products. One of the first things to check regarding food which has been stored in the 'use-by' or 'best-before' dates printed on the packaging.

These dates will give you the most accurate indication of a food's shelf life, however, when a packet or can is opened, the expiry date almost always changes.

Refrigerating and Freezing Food

To reduce the risk of bacterial contamination, many foods must be stored in the refrigerator and thus kept below 5°C. These foods are often classified as 'high-risk foods' and include – meat, poultry, dairy,

seafood, eggs, small goods and cooked rice and pasta. This also refers to ready-to-eat foods that have high-risk foods as ingredients and include – casseroles, quiche, pasta salad, pizza, sandwiches and many cakes.

By keeping these high-risk foods under 5°C it stops them from entering the 'danger-zone' – temperatures between 5°C and 60°C. The danger-zone is the temperature zone which provides bacteria with the perfect environment to rapidly grow and multiply to numbers that cause food poisoning.

By freezing food its longevity is increased because the water content of the food freezes – this prevents bacteria from multiplying and food spoiling. Food should be kept frozen at –18°C; when thawing, it should be stored in a refrigerator that reaches no more than 5°C until it is ready to be prepared.

5.1.5 Transportation

Selling fresh and high-quality produce is essential in groceries and retail food businesses. That's why the transport and storage of foods is so important, and refrigerated transport is essential to achieve this.

Refrigerated Transportation

Refrigerated transportation is a shipping cargo with advanced temperature adjustment features. It is built and designed mainly for climate-sensitive goods such as vegetables, fruits, meat, all-prep meals, bread, etc. in which the freight is loaded with ice and salt to maintain the food's quality at a particular temperature.

Fig. 5.1.6: Refrigerated Transportation

Ambient Temperature for Shipping

When it comes to cold chain logistics, maintaining ambient temperature tends to mean maintaining a temperature between 15°C to 25°C or 59°F to 77°F. These temperatures fall in the range of comfortable room temperature instead of being on one extreme and of temperature ranges.

5.1.6 HACCP, TACCP, VACCP, control measures, critical control point, critical limit

HACCP (Hazard Analysis Critical control point): It is a systematic approach in identification, evaluation and control of food safety hazards and it's written documented plan based on HACCP principles known as HACCP Plan. It has 12 steps and 7 principles as:-

- Assembly of HACCP Team
- Describe Product
- Identify indent use
- Draw Flowchart / Diagram
- Verify Flowchart/ Diagram
- Conduct a hazard analysis (Principle 1)
- Determine critical control points (CCPs) (Principle 2)
- Establish critical limits (Principle 3)
- Establish monitoring procedures (Principle 4)
- Establish corrective actions (Principle 5)
- Establish verification procedures (Principle 6)
- Establish record-keeping and documentation procedures (Principle 7)

VACCP (Vulnerability Analysis Critical control points):

It focuses on food fraud as well, and widens the scope to include systematic prevention of any potential adulteration of food, whether intentional or not, by identifying the vulnerable points in a supply chain. It is especially concerned with economically motivated adulteration (EMA). Examples include product substitutions, unapproved product enhancements, counterfeiting, stolen goods and others.

TACCP (Threat Analysis Critical control points): generally requires a wider range of employee involvement than HACCP, as it covers issues such as manufacturing plant and transportation security, IT security, and employee background checks. Some points will overlap with HACCP, such as tamper-proof seals and various quality control checks.

Reduce the likelihood (chance) and consequence (impact) of a deliberate attack;

Protect organizational reputation;

Reassure customers and the public that proportionate steps are in place to protect food;

Demonstrate that reasonable precautions are taken and due diligence is exercised in protecting food.

Control: It is means to prevent, eliminate, or reduce hazard.

Control measures: It is means of any action or activity that is used to prevent, reduce to acceptable levels, or eliminate a hazard.

Critical limit: it is means a point, step, or procedure in a food process at which a control measure can be applied and at which control is essential to prevent, reduce to an acceptable level, or eliminate an identified food hazard.

UNIT 5.2: Schedule IV requirements of FSSAI

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify requirements in Schedule IV in FSSAI

5.2.1 Schedule IV Requirements of FSSAI

To provide assurance of food safety, Food businesses must implement an effective Food Safety Management System (FSMS) based on Hazard Analysis and Critical Control Point (HACCP) and suitable pre- requisite programmes by actively controlling hazards throughout the food chain starting from food production till final consumption.

As per the condition of license under FSS (Licensing & Registration of Food Businesses) Regulations 2011, every food business operator (FBO) applying for licensing must have a documented FSMS plan and comply with schedule 4 of this regulation. Schedule 4 introduces the concept of FSMS based on implementation of Good Manufacturing Practices (GMP) and Good Hygiene Practices (GHP) by food businesses and is divided into five parts as under:.

Schedule 4	General Requirements
Part 1	General hygienic and sanitary practices to be followed by food business operators applying for registration - Petty food operators and Street food vendors
Part 2	General hygienic and sanitary practices to be followed by food business operators applying for license- Manufacturing/ processing/ packaging/storage/distribution
Part 3	General hygienic and sanitary practices to be followed by food business operators applying for license- Milk and milk products
Part 4	General hygienic and sanitary practices to be followed by food business operators applying for license- Slaughter house and meat processing
Part 5	General hygienic and sanitary practices to be followed by food business operators applying for license- Catering

Table 5.2.1: Five Parts of Good Manufacturing Practices (GMP) and Good Hygiene Practices (GHP)

Part II: General hygienic and sanitary practices to be followed by food business operators applying for license- Manufacturing/ processing/ packaging/storage/distribution

- **Location and Surroundings**
- Location shall be:
  - away from environmentally polluted areas
  - away from industrial activities which produce:
  - Disagreeable or obnoxious odor,
  - Fumes
  - Excessive Soot
  - Dust

Fig. 5.2.1: Location and Surrounding factors

- Smoke
- Chemical or biological emissions
- Pollutants
- Layout and Design of Food Establishment Premises

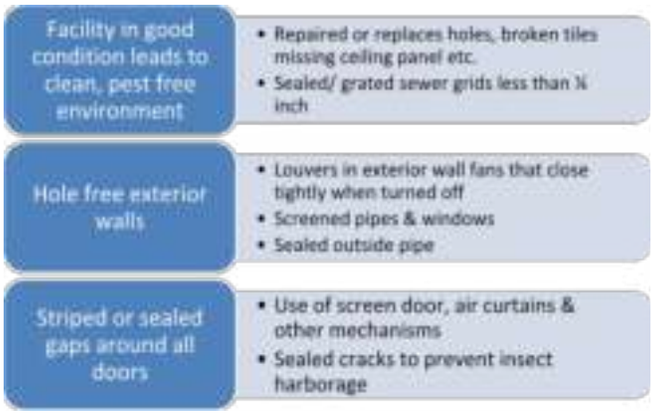

Fig. 5.2.2: Layout and Design factors

- **Equipment and Containers**
  - made up of non-corrosive / rust free material
  - smooth, free from any grooves
  - easy to clean and maintain
  - non-toxic and non-reactive
  - of food grade quality

Fig. 5.2.3: Equipment and Container factors

- **Facilities**
  - **Water supply**
    - Only potable water meeting BIS (Bureau of Indian Standards) standards
    - Appropriate facilities for storage and distribution of water
    - Periodic cleaning of storage tanks and its record
    - Non-potable water, if used, only for cooling of equipment, steam production, fire fighting
    - Distinguished non-potable water pipes

Colour coding of water pipes to avoid contamination

Fig. 5.2.4: Water Supply

- Drainage and waste disposal
  - Disposal of sewage and effluent in conformance with the requirements of Factory
  - Designed and constructed to reduce risk of contamination to food and potable water
  - Separate waste storage area
  - Covered containers for waste storage
  - No accumulated waste in food handling, food storage or other working areas
  - Periodic disposal of waste/refuse
  - Pedal operated adequate size bins for waste collection
  - Waste bins emptied and washed daily with a disinfectant and dried before next use

Fig. 5.2.5: Waste Disposal

Fig. 5.2.6: Drainage System

- Personnel facilities and toilets
  - Facilities for washing and drying hands
  - Supply of hot and cold water
  - Separate lavatories of appropriate hygiene design for males and females separately
  - Suitably located Changing facilities for personnel
  - No direct opening of such facilities in food processing, service or storage area

Fig. 5.2.7: Personal facilities

- **Ventilation and Lighting**
  - Air quality and ventilation:
    - Natural / mechanical ventilation system including air filters, exhaust fans
    - Designed and constructed as such air does not flow from contaminated areas to clean areas
  - Lighting
    - Adequate Natural /artificial lighting
    - Protected lightings to avoid contamination by breakages

Fig. 5.2.8: Ventilation and Lighting

- **Food Operations And Controls**
  - **Procurement of raw materials**
    - Quality raw materials (free of parasites, micro-organisms, pesticides etc.)
    - Raw material conforming to the regulations under the act
    - Records of raw material as source of procurement

Fig. 5.2.9: Procurement of raw materials

  - **Storage of raw materials and food**
    - Adequate food storage facilities to protect food from contamination
    - Cold storage facilities according to requirement
    - Segregation of storage area for raw and processed food, recalled materials, packaging materials, stationary, cleaning materials/ chemicals
    - Separate cold storage of raw food like meat/poultry/seafood product away from the area of WIP (Work in Progress), processed, cooked and packaged products.
    - Monitoring of temperature and humidity
    - FIFO First received (In) materials must move out first
    - Non –toxic containers for food storage
    - Stored on racks or pallets well above the floor and away from the wall

Fig. 5.2.10: Storage of raw materials and food

Review Of Product Label /Packaging Usage And Control

Labels should be reviewed allergens are mentioned don it prior to their receipt for their accuracy. Line Personnel should be trained to ensure labelling is changing when a changeover takes place.

Food Processing / Preparation, Packaging and Distribution / Service

- **Storing at appropriate temperature:** The Food Business shall develop and maintain the systems to ensure that time and temperatures are controlled effectively where it is critical to the safety and suitability of food. Such control shall include time and temperature of receiving, processing, cooking, cooling, storage, packaging, distribution and food service till it reaches the consumer, as applicable.
- **Food Packaging:** Packaging materials shall provide protection for all food products to prevent contamination, damage and shall accommodate required labelling as laid down under the FSS Act & the Regulations there under.
- **Transportation:** All critical links in the supply chain need to be identified and provided for to minimize food spoilage during transportation. Processed / packaged and / or ready-to-eat food shall be protected as per the required storage conditions during transportation and / or service.
- **Management and Supervision**
  - Provision of resources to implement & maintain Food Safety
  - Developing SOPs for processing, packing, dispatch & storage of food
  - Competent Technical Managers & Supervisors:
    - having skills on food hygiene principles & practice
    - taking appropriate preventive & corrective action
    - ensure effective monitoring and supervision.
- **Maintaining Process related records (e.g. production records)**
- **Sanitation And Maintenance of Establishment Premises**
  - Facilities should permit effective cleaning.
- **Cleaning Program**
  - areas to be cleaned,
  - cleaning frequency,
  - procedure,
  - equipment,
  - cleaning material and method

Visualizing for HK material

Kamishibai Board for maintaining HK

Hanging of Flexible pipes for ease of cleaning

Fig. 5.2.11: Cleaning Program

- **Maintenance**
  - Preventive and Corrective Maintenance
  - Lubricants and heat transfer fluids shall be food compatible Procedure for releasing maintained equipment back to production
  - Maintenance personnel shall be trained in the product hazards associated with their activities

Fig. 5.2.12: Maintenance

- **Pest Control Systems**
  - Report pest infestations immediately.
  - Do not use pesticides/insecticides in food processing area.

Fig. 5.2.13: Fly Catcher and Rodent Traps

- **Personal Hygiene**
  - Health Status
    - Personnel suffering from disease or illness shall not be allowed to enter in food handling area
    - System to report illness or symptoms of illness to management
    - Medical examination of food handlers/ employees once in a year
    - Records of medical examination
    - Factory shall be compulsorily inoculated against the entire group of diseases and recorded
    - In case of epidemic, all workers to be vaccinated irrespective of the yearly vaccination.
  - **Personal Cleanliness**
    - High degree of personal cleanliness by food handlers
    - Food business shall provide to all food handlers;
    - Protective clothing
    - Head covering
    - Face mask
    - Gloves
    - Foot wear

Fig. 5.2.14: Personal Cleanliness

- **Visitors Generally**
  - Generally visitors should be discouraged to go inside the food handling areas
  - The food business shall ensure visitors to its food manufacturing/ handling areas shall;
  - Wear protective clothing
  - Footwear
  - Adhere to personal hygiene provisions envisaged in the respective section
- **Product Information And Consumer Awareness**
  - Batch Identification
    - Identifies producer
    - Product recall
    - Effective stock rotation - FIFO
  - Product Information
    - Adequate information & enables other person in food chain to handle, display, store, prepare & use the product safely & correctly
  - Labeling
    - Should confirm to Legal Requirements
- **Consumer Education**
- **Training**
  - Awareness & responsibilities
  - Training Programmes
    - Nature of food
    - Control Spoilage
    - Handling of food
    - Storage
  - Training Records
  - Instruction & supervision
    - Periodic assessment of training & effectiveness
  - Refresher training
- **Good Manufacturing Practices For Whole Premise**

  Good Manufacturing Practices* (GMPs) are the basic operational and environmental conditions required to produce safe foods. They ensure that ingredients, products and packaging materials are handled safely and that food products are processed in a suitable environment.

  GMPs address the hazards associated with personnel and environment during food production. They provide a foundation for any food safety system. Once GMPs are in place, processors can implement a Hazard Analysis Critical Control Point (HACCP) system to control hazards that may affect the ingredients and packaging material during food processing.

GMPs Address:

Fig. 5.2.15: GMPs Address

- **Environmental control (premises):** Location, design and construction of the building and its interior, equipment, water supply.
- **Personnel practices:** Personal hygiene, hand washing, clothing/footwear/headwear, injuries and wounds, evidence of illness, access and traffic patterns, chemical use.
- **Shipping, receiving, handling, storage:** Inspection procedures for transport vehicles; loading, unloading and storage practices; inspection procedures for incoming products; shipping conditions; returned and defective products; allergen control; chemical storage; waste management.
- **Pest control:** Monitoring procedures for the exterior and interior of the building (ex: surveillance, fumigation) and the use of pesticides.
- **Sanitation:** Cleaning and sanitizing procedures and pre-operational assessment.
- **Equipment maintenance:** Procedures describing preventive maintenance and calibration of all the equipment and instruments that can affect food safety (ex: thermometers, thermocouples, metal detectors, scales, pH meters)
- **Recall and traceability:** Procedures that ensure final products are coded and labeled properly; incoming materials; in-process and outgoing materials are traceable; recall system is in place and tested for effectiveness (ex: procedures for mock recalls).
- **Water safety:** Water safety monitoring procedures for water, ice and steam, and water treatment procedures that ensure it is potable for use in food processing

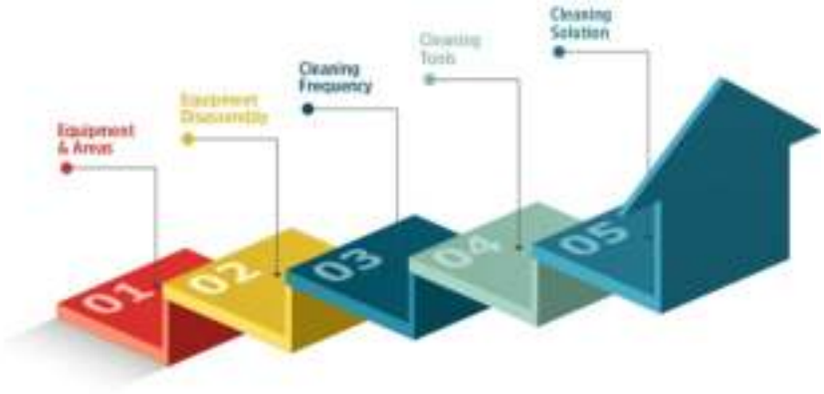

Fig. 5.2.16: Storage of sanitizing materials

Where and How to Store Your Cleaning Supplies

- **Clean, Cool, Dry:** Store your cleaning supplies in an area that is clean and free of debris. Make sure that there aren't any temperature extremes in the area where your cleaning supplies are stored. Another thing to make sure of is that the area is dry.
- **Original Containers:** Keep cleaning supplies in their original containers. If you mix your own cleaners, make sure you use new clean bottles and label them to avoid a mixup.
- **Safe Storage:** Be sure to keep your cleaning supplies stored in places where your children and/or pets will not be able to get to them. Consider higher storage or locked storage options to protect small children and pets.

Cleaning and Sanitization Process, Need and Importance

Workplace Sanitation: Maintaining a clean work environment is critical in preventing foodborne illness. Bacteria can grow on unsanitary surfaces and then contaminate food. Just because a work surface looks clean does not mean that it is sanitary. Always ensure that you clean and sanitize a work area before starting to prepare food.

Cleaning Procedures and Schedules: Cleaning with soap and other detergents is just one step of the cleaning procedure. It is also necessary to sanitize. Cleaning will remove any dirt or grease, but will not necessarily kill any bacteria or other pathogens. Only a sanitizer will kill bacteria and ensure the area is safe for food preparation. Leading sanitizers used in the food service industry are chlorine solutions (bleach), quaternary solutions (quarts), and iodine. Use these materials according to the manufacturer's instructions that accompany the product and that are found on the material safety data sheet (MSDS) using the appropriate personal protective equipment.

A sanitation plan is important in any food service preparation area. It ensures that all surfaces are cleaned on a regular basis and reduces the risks of transferring bacteria or other pathogens from an unclean surface to clean equipment such as cutting boards or tools. A sanitation plan has two components:

- A list of cleaning and sanitizing agents or supplies with instructions on their safe use and storage
- A cleaning schedule, outlining how each item needs to be cleaned, who is responsible, and how frequently it happens

Routine Equipment Maintenance

Refer to the manufacturer's instructions and training provided by your employer or instructor on how to do this safely. Some equipment is intended to be cleaned in place. This should be identified in your sanitation plan and cleaning schedule.

All equipment must be routinely cleaned and inspected. Older equipment may have nooks and crannies where dirt and bacteria can hide, which can be difficult to clean effectively. Proper cleaning procedures must be established and followed at all times with regular review to ensure that procedures are working. If equipment is replaced or cleaning materials change, the process may have to be adjusted. If you notice any safety concerns with the equipment while cleaning it, such as a frayed cord, missing guard or loose parts, let your supervisor know immediately.

- **Good Food Hygiene Practices**
  - Cleaning
    - Food areas and equipment between different tasks, especially after handling raw food shall be cleaned.
    - The surface shall be thoroughly cleaned in case if somebody spills food / water / drink.
  - Raw materials
    - Raw materials shall be purchased from reliable and known dealers and checked for visible deterioration & off-odour, physical hazards and foreign body contamination.

Fig. 5.2.17: 8 Principles based on eight quality management principles

- Cooking
  - The preparation/ processing/ cooking should be adequate to eliminate and reduce hazards to an acceptable level which might have been introduced at the raw food level.
  - The preparation/ processing/ cooking methods should ensure that the foods are not re-contaminated.
  - The preparation/ processing/ cooking of veg. & non-veg. products should be segregated.
  - Whenever cooking or reheating of food is done, it should be hot all the way through, it is especially important to make sure that food is cooked thoroughly.
  - Re-use of cooking oil should be avoided.
  - In case of reheating of oil use maximum three times to avoid the formation of Trans fat. It is ideal to use once if possible.
- Chilling
  - Semi cooked or cooked dishes and other ready-to-eat foods such as prepared salads and desserts having short shelf life should not be left standing at room temperature.
  - Chilled food intended for consumption should be cold enough.
  - Food items that need to be chilled should be put straight away into the fridge.
  - Cooked food should be cooled as quickly as possible and then put it in the fridge.
  - Chilled food should be processed in the shortest time possible.
  - Fridge and display units should be cold enough and as per requirement. In practice, fridge should be set at 5°C to make sure that food is kept in chilled condition. Also, fridge and display units should be maintained in good working condition to avoid food spoilage and contamination.
- Cross-contamination

  Following should be done to avoid cross-contamination.
  - Separation of each crop/species and also processed and unprocessed foods.
  - Hands should be thoroughly washed after touching.
  - Work surfaces, chopping boards and equipment should be thoroughly cleaned before the preparing of food starts and after it has been used.

- Personal Hygiene
  - High standards of personal hygiene should be maintained.
  - All employees handling food should wash their hands properly:
    - before preparing food
    - after touching raw food or materials, specially meat/poultry or eggs
    - after breaks
    - after using the toilet after cleaning the raw materials or utensils / equipments
  - Street shoes inside the food preparation area should not be worn while handling & preparing food.
  - Food handlers should ensure careful food handling & protect food from environmental exposure.
- Transportation and Handling Of Food
  - Food shall be adequately covered during transportation to assure food safety.
  - Transportation vehicles
    - Vehicle inspection
    - Shall not contaminate foods & packaging
    - Should be easy to clean and maintain

- Provide effective protection from dust & dirt
- If required maintain temperature, humidity, atmosphere
- If required allow monitoring of temperature, humidity, etc.
- Should be used only for carrying food.
- Regular maintenance of vehicles is required.
- Appropriate supply chain to minimize food spoilage
- Non-toxic, clean, well maintained food containers during transportation
- Temperature and humidity control during transportation
- Dedicated vehicles for food transportation
- Effective cleaning and sanitation of vehicles between loads carrying high risk foods as fish, meat poultry to avoid cross contamination

Fig. 5.2.18: Transportation and handling of food

- Storage
  - It is very important to store food properly for the purpose of food safety. Following things must be ensured:
    - Raw meat/poultry should be stored separately from other foods
    - Storage temperature of frozen food should be -18°C or below.
    - Storage instructions over food packaging should be followed.
    - Dried foods (such as grains and pulses) should be stored off the floor, ideally in sealable containers, to allow proper cleaning and protection from pests.
    - Store commercial ice cream at temperatures below 0°F.
    - Store biscuit, brownie, and muffin mixes at room temperature.

Stock rotation

The rule for stock rotation is FIFO (first in, first out) to make sure that older food is used first. This will help to prevent wastage. Older product will have nearer shelf life expiry, so older product should be moved out first, but new products will have time to move out since expiry is so far. That's why a rule of FEFO does also exist which means First Expiry First Out. It is called Good Distribution Practice.

UNIT 5.3: Personal Hygiene

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify types of health and safety policies and procedures

5.3.1 Personal Hygiene

The expression "food hygiene" is often associated to personal hygiene. The concept of food hygiene really refers to the general cleanliness state of the food handlers' body and clothes. Microorganisms can easily pass to food and reach the consumer if the handler comes into contact with any pathogenic microorganism by their clothes, hands, hair, nails, rings and then sets out to prepare food. As so, the personal hygiene of whoever contacts with food, as well as behaviors they assume during its processing, constitute an important preoccupation in the food business. The set of rules, conditions and practices that assure adequate personal hygiene make up the good practices for personal hygiene.

5.3.2 Importance of Personal Hygiene

It is imperative for safe food-handling outcomes for all workers to be familiar with standard sanitation and hygiene practices. Fig. 1.3.1 shows the cycles of transmission of micro-organisms. One of the basic principles is to break the cycle by avoiding cross-contamination, which can be achieved by ensuring personal hygiene practices are followed.

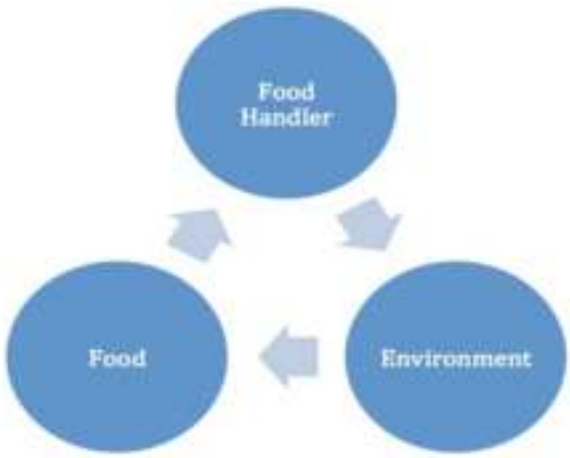

Fig. 5.3.1: Importance of Personal Hygiene

Proper personal hygiene is critical in any food service premise. Personal hygiene includes:

- Showering and bathing regularly
- Keeping hair clean hair and covered or tied back
- Keeping clean clothing and footwear that is used only at work
- Hand washing regularly

Fig. 5.3.2: Personal hygiene

5.3.3 Hand Washing

Proper and regular hand washing is a critical part of any food safety system.

Fig. 5.3.3: Methods of washing hand

How to Use Sanitizer?

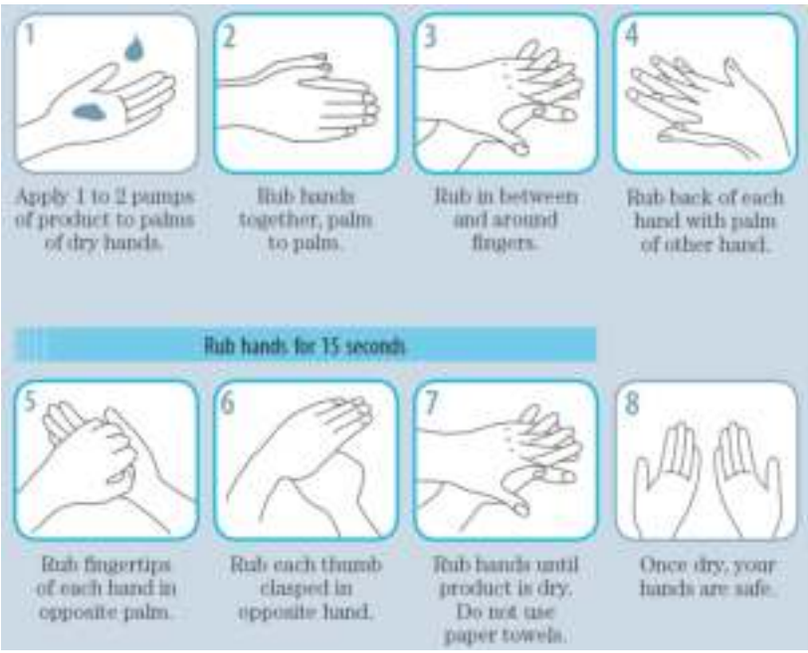

Fig. 5.3.4: Usage of Sanitizer

When to Wash and Sanitize Hand?

Fig. 5.3.5: Times to wash and sanitize hand

We need to stop the spread of COVID-19 in food industry by washing hands regularly with soap and water for 20 seconds – especially after going to the bathroom, before eating, and after coughing, sneezing, or blowing our nose.

5.3.4 Good personal hygiene can prevent food poisoning

Bacteria that cause food poisoning can be on everyone – even healthy people. You can spread bacteria from yourself to the food if you touch your nose, mouth, hair or your clothes, and then food.

Good personal hygiene also makes good business sense. Customers like to see food-handling staff who take hygiene seriously and practice safe food handling.

- Personal hygiene is important to prevent food poisoning.
- When handling food, wash your hands thoroughly and often.
- If you are sick, do not go to work, because you can contaminate food more easily.
- Food handlers should be properly trained in safe food handling.

Food handling businesses ensure the following factors are considered to ensure personal hygiene:

- **Hand Washing —** ensure effective hand washing techniques are followed at appropriate times
- **Minimise hand contact with food —** try to minimise direct hand contact with raw food by using appropriate utensils and safe use of disposable gloves
- **Personal cleanliness —** cover hair; do not sneeze or cough over food; cover cuts and sores; and do not wear jewellery
- **Wear protective clothing —** wear suitable clean protective clothing and handle appropriately to prevent cross contamination
- **Exclude ill staff —** staff must report illnesses; exclude staff with vomiting or diarrhoea

UNIT 5.4: Health Safety

Unit Objectives

By the end of this unit, the participants will be able to:

1. Illustrate the concept of health safety
2. Understand the hazards of health safety
3. Explain the health and safety policies and procedures
4. Describe the personal protective equipment
5. Discuss the types of personal protective equipment

5.4.1 Health Safety

The term Health and Safety is generally used to describe Occupational Health and Safety, and relates to the prevention of accidents and ill health to employees and those who may be affected by their work.

5.4.2 Health Safety Hazards

Safety hazards exist in every workplace, but how do you know which ones have the most potential to harm workers? By identifying hazards at your workplace, you will be better prepared to control or eliminate them and prevent accidents, injuries, property damage, and downtime.

First of all, a key step in any safety protocol is to conduct a thorough safety hazard assessment of all work environments and equipment

In a safety hazard assessment, it is important to be as thorough as possible because after all, you can't protect your workers against hazards you are unaware of and unprepared for. Avoid blind spots in your workplace safety procedures by taking into consideration these 3 types of workplace hazards:

- **Safety hazards**

  Safety hazards are number one on the list of 3 types of workplace hazards. These hazards play an effect on employees who work directly with machinery or in construction sites. Safety hazards are unsafe working conditions that that can cause injury, illness, or death.

  

  Fig. 5.4.1: Safety hazards

  Safety hazards are the most common workplace risks. They include:

  - Anything that can cause spills or trips such as cords running across the floor or ice
  - Anything that can cause falls such as working from heights, including ladders, scaffolds, roofs, or any elevated work area.
  - Unguarded and moving machinery parts that a worker can accidentally touch.
  - Electrical hazards like frayed cords, missing ground pins and improper wiring
  - Confined spaces

- **Ergonomic hazards**

  Ergonomic safety hazards occur when the type of work, body positions, and working conditions put a strain on your body.

  Ergonomic Hazards include:

  - Improperly adjusted workstations and chairs
  - Frequent lifting
  - Poor posture
  - Awkward movements, especially if they are repetitive
  - Having to use too much force, especially if you have to do it frequently
  - Excessive vibration

Fig. 5.4.2: Ergonomic Hazards

- **Work organization hazards**

Safety hazards or stressors that cause stress (short-term effects) and strain (long-term effects). These are hazards associated with workplace issues such as workload, lack of control and/or respect, etc.

Examples include:

- Workload demands
- Workplace violence
- High intensity and/or pace
- Respect (or lack thereof)
- Flexibility
- Control or say about things
- Social support or relations
- Sexual harassment

5.4.3 Health and Safety Policies and Procedures

Overview

The law says that every business must have a policy for managing health and safety.

A health and safety policy sets out your general approach to health and safety. It explains how you, as an employer, will manage health and safety in your business. It should clearly say who does what, when and how.

5.4.4 What is Personal Protective Equipment?

Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Personal protective equipment may include items such as gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, or coveralls, vests and full body suits.

Employers are also required to train each worker required to use personal protective equipment to know:

- When it is necessary
- What kind is necessary
- How to properly put it on, adjust, wear and take it off
- The limitations of the equipment
- Proper care, maintenance, useful life, and disposal of the equipment

If PPE is to be used, a PPE program should be implemented. This program should address the hazards present; the selection, maintenance, and use of PPE; the training of employees; and monitoring of the program to ensure its ongoing effectiveness.

5.4.5 Types of PPE

Head protection

Examples of head protection equipment:

- Helmets;
- Hard hats;
- Hair nets

Hand protection

Examples of hand protection equipment:

- Work gloves and gauntlets;
- Wrist cuff arm nets.

Eye and face protection

- Safety glasses and goggles;
- Eye and face shields;

Fig. 5.4.3: Eye and face protection

Respiratory Protection

This type of PPE must be present when being in contact with large amounts of gases, powders, dust and vapors.

Fig. 5.4.4: Types of Respirators

Hearing protection

Examples of hearing protection equipment:

- Earplugs and defenders;
- Noise meters;
- Communications sets;
- Acoustic foam.

Foot protection

As examples of foot protection equipment can be pointed out the following ones:

- Safety boots and shoes;
- Anti-static and conductive footwear.

Height and access protection

As examples of height and access protection equipment can be mentioned in the following ones:

- Fall-arrest systems;
- Body harnesses;
- Lowering harnesses;
- Rescue lifting;
- Energy absorbers and others

Fig. 5.4.5: FSSAI dos and don'ts for food handlers

First aid kit

The kit should be kept in an accessible location and /or close to areas where there is a higher risk of injury or illness. The first aid kit should provide basic equipment for administering first aid.

Pictograms

Not only is preparing your workshop for accidents a smart thing to do, it is even smarter to organize your workshop in such a way that no serious accidents can take place. A simple way to make your workshop safer is to use pictograms: indicating flammable materials, the necessary use of hearing protection, indicating emergency exits.

Health and Safety Policy

FBO is committed to the goal of providing and maintaining a healthy and safe working environment, with a view to continuous improvement. This goal is only achievable by adherence to established objectives striving to exceed all obligations under applicable legislation, and by fostering an enthusiastic commitment to health, safety and the environment.

In particular:

Management, working in cooperation with the Joint Health and Safety Committee, will strive to take all reasonable steps to reduce workplace hazards to as low as reasonably achievable.

Supervisors and managers are held accountable for the health and safety of all employees under their supervision. This includes responsibility for applicable training and instruction, appropriate followup on reported health and safety concerns, and implementation of recommended corrective action.

FBO is committed to providing all necessary training and instruction to ensure that appropriate work practices are followed on the job, and to promote their use off the job.

Health, safety, the environment and loss control in the workplace are everyone's responsibility. Company expects that everyone will join in our efforts to provide a healthy and safe working environment on a continuous day to day basis.

Importance of Preventive Health Checkups

No matter what age group you are a part of, regular preventive health tests are essential for each one of us.

Whether one is feeling fit from within or is still in his early years of life, a preventive health checkup is an important practice that one must inculcate in his or her daily life.

- It can detect developing disease and prevent them
- Increase better chances for treatment and cure
- Can identify health issues early and prevent them
- It helps to improve lifestyle and increase productivity at work.

FSSAI Format for health check up

PERFORMA FOR MEDICAL FITNESS CERTIFICATE FOR FOOD HANDLERS

(FOR THE YEAR .....)

(See Para No. 10.1.2, Part- II, Schedule - 4 of FSS Regulation, 2011)

It is certified that Shri/Smt./Miss..... employed with M/s....., coming in direct contact with food items has been carefully examined* by me on date ..... Based on the medical examination conducted, he/she is found free from any infectious or communicable diseases and the person is fit to work in the above mentioned food establishment.

Name and Signature with Seal
of Registered Medical Practitioner /
Civil Surgeon

***Medical Examination to be conducted:**

1. Physical Examination
2. Eye Test
3. Skin Examination
4. Compliance with schedule of Vaccine to be inoculated against enteric group of diseases
5. Any test required to confirm any communicable or infectious disease which the person suspected to be suffering from on clinical examination.

Fig. 5.4.6: Format for health check up

Medical examination to be concluded –

1. Physical examination
2. Eye Test
3. Skin examination
4. *Compliance with schedule of vaccine to be inoculated against enteric group of diseases
5. Any test required to confirm any communicable or infectious disease which the person suspected to be suffering from on clinical examination

* Vaccine to be inoculated against enteric group of diseases shall be decided by the medical practitioners in accord to remove the ping to the list as declared by the municipal corporation of that area.

Summary

- Food safety refers to routines in the preparation, handling and storage of food meant to prevent food borne illness and making food safe for human consumption. Safe food handling practices and procedures are thus implemented at every stage of the food production life cycle in order to curb these risks and prevent harm to consumers.
- It is important to be aware of food allergens in food industry as this is the risk associated with the unintended presence of allergen due to cross contamination and should take this a matter of serious concern. Food allergies can cause serious and even deadly reactions.
- The presence of unwanted materials such as dust and particles during the manufacturing and transportation time is called contamination. The term contaminants include any unwanted matter that is found in the product. These contaminants affect the quality of the product or the process.
- Refrigerated transportation is a shipping cargo with advanced temperature adjustment features. It is built and designed mainly for climate-sensitive goods such as vegetables, fruits, meat, all-prep meals, bread, etc. in which the freight is loaded with ice and salt to maintain the food's quality at a particular temperature.
- The retail food industry plays a significant role in assuring a safe food supply for its consumers. At the retail level, activities to control food safety risks can be divided into four key areas: the supplier and source of foods and food ingredients; in-store practices and procedures; education and training of employees and food handlers; and consumer engagement.
- Good Manufacturing Practices (GMPs) are the basic operational and environmental conditions required to produce safe foods. They ensure that ingredients, products and packaging materials are handled safely and that food products are processed in a suitable environment.
- Maintaining a clean work environment is critical in preventing foodborne illness. Bacteria can grow on unsanitary surfaces and then contaminate food. Just because a work surface looks clean does not mean that it is sanitary. Always ensure that you clean and sanitize a work area before starting to prepare food.
- The rule for stock rotation is FIFO (first in, first out) to make sure that older food is used first. This will help to prevent wastage. Older product will have nearer shelf life expiry, so older product should be moved out first, but new products will have time to move out since expiry is so far. That's why a rule of FEFO does also exist which means First Expiry First Out. It is called Good Distribution Practice.
- The expression "food hygiene" is often associated to personal hygiene, being many times limited to the care of washing hands. The concept of food hygiene really refers to the general cleanliness state of the food handlers' body and clothes.
- Health and Safety is a term that generally covers the legal requirements that fall under the Health and Safety at Work Act etc. 1974. The term Health and Safety is generally used to describe Occupational Health and Safety, and relates to the prevention of accidents and ill health to employees and those who may be affected by their work.

Exercise

A. Answer the following questions briefly.

1. _____ refers to routines in the preparation, handling and storage of food meant to prevent food borne illness and making food safe for human consumption.
   a. Food Safety
   b. Fire Safety
2. _____ is a factor or agent which may lead to undesirable effects like illness or injury in the absence of its control, whereas, risk refers to the probability that the effect will occur.
   a. Threat
   b. Hazard
3. The presence of _____ materials such as dust and particles during the manufacturing and transportation time is called contamination.
   a. wanted
   b. unwanted
4. _____ is one of the most important factors in the preservation of food because microorganisms have been found to grow in almost all temperature.
   a. Storage temperature
   b. Hazard temperature
5. Selling fresh and _____ produce is essential in groceries and retail food businesses.
   a. low-quality
   b. high- quality

B. Answer the following questions by choosing the correct option:

1. What are the most common types of contaminant?
2. Outline the layout and design of food establishment premises.
3. Explain VACCP
4. What are the facilities provided by water supply?
5. What are the two components of the sanitation plan?

Notes

_____

_____

_____

_____

_____

_____

_____

_____

NCVET

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FICSI
Food Industry Capacity and Skill Initiative

6. Managing Accidents and Emergencies

FIC/N9901

Key Learning Outcomes

By the end of this module, the participants will be able to:

1. Recognize the types of hazards, risks as well as accidents
2. Categorize the standard precautions and practices
3. Examine the utilization of the electrical equipment
4. Explore the usage of personal protective equipment
5. Recognize the organizational protocols
6. Monitor the ways to handle the toxics
7. Identify fire prevention and fire extinguisher
8. Evaluate CPR as well as the artificial respiration
9. Discuss the evacuation and rescue
10. Catalogue the first aids
11. Understand the ill health as well as potential injuries
12. Demonstrate the precautions in mobility
13. Discuss the significance of various types of hazard and safety signs

UNIT 6.1: Hazard, Risk and Accidents

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify the types of hazards, risks as well as accidents

6.1.1 Types of hazards, risks and accidents

Hazard is considered a sort of incident or source that can fundamentally harm something, whether in a living or non-living state. It states to be significant to identify the hazard and the amount of risk or impact it would create on its surroundings. Thus, an individual must be prepared from the initial stages to manage such occurrences.

It is important to control workplace hazards by eliminating and identifying the capable risks. This is required as it is capable of causing accidents or hazards, along with finding the access based on the ways to isolate the risk which can lead to the hazard.

To ensure the safety of an individual and the workplace surrounding, an individual requires to regularly participating in the safety drill, which is conducted at their specific times.

Types of Hazards:

- **Safety Hazard:** A safety hazard is among the most common dangers found in every workplace. A safety hazard is capable of causing specific serious injuries or damage to the industrial workers. The safety hazards perform a practical part on the employees who have regularly contacted the heavy equipment or machinery throughout their working hours.

  Some of the safety hazards which lead to accidents in the workplace tend to include:

  - Anything capable of causing a fall, such as floor holes or opening walls, slippery surfaces, unprotected edges, and ladders which is unsafely situated.
  - Heavy-duty mechanisms, which is seen to be usually present in every industry, such as construction, manufacturing, mining and so on, can sometimes be the cause behind the accident. It is due to loose machinery parts, sharp edges, hot surfaces causing severe cuts, burns and wounds.
- **Chemical Hazards:** Chemical substances are seen to include but are also not restricted to acidic substances, petroleum products, reagents, acids, flammable liquids and many more.
  - Acidic substances are firmly alkaline in their state as they tend to possess properties to damage the accidental arrival in contact with the other substances by forming a chemical reaction.
  - The petroleum products generate gasoline such as Butane, Propane, Kerosene, and LPG as they are incredibly flammable hazards and can damage on a larger scale.
  - Acids occur to be more hazardous, relying on their corrosive materials. The common acid includes Hydrochloric Acid, Sulphuric Acid, and Nitric Acid.
- **Biological Hazards:** Biological hazard is also known as the biohazard and is connected to the biological substances that lead to sickness and illness in humans during its occurrence in direct contact.

  Sources through which the biological hazard might include are:

  - Bacteria, viruses, insects, plants and humans are capable of being the hazard carrier that adversely impacts their health, causing skin irritation and can also lead to serious infections, like Tuberculosis, AIDS, and carcinogenic infection.

- Toxins from biological sources stand to be extensively poisonous in their state as they are manufactured by harmful animals and plants, such as snake venom toxins and botulinum toxins.
- The most recent example of the biological hazard is the outbreak of Covid-19.

- **Physical Hazard:** A physical hazard is the least common hazard at the workplace and is not limited only to physical presence. Extreme weather conditions or unfavourable working environments are the major causes of physical hazards.

  Physical hazard has a prolonging effect on the health of the workers. These types of hazards are generally unrecognizable, like:

  - The temperature can also be a cause of danger for the workers who attempt to work indoor as well as outdoors, having the factors such as overexposure to heat and cold leading to some serious illness like heat stroke, sweaty palm increasing the risk of accident, frostbit hypothermia which can eventually lead to death also.
  - Harmful radiation like micro-waves, radio-waves, electro-magnetic waves, and so on.

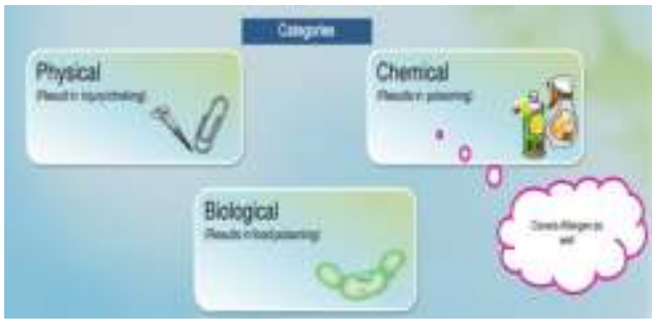

Fig. 6.1.1: Examples of physical, Chemical, Biological hazards

- **Ergonomic Hazard:** An ergonomic hazard is a type of hazard that adversely affects the workers' physical health, having continuous work leading to lower back pain, joint pains, muscles ache, and ligaments pain.

  Ergonomic hazards may include:

  - Poor sitting or standing postures.
  - Improperly adjusted chairs and workstation height.
  - Too much vibration or loud noise in the workplace.
  - Frequent lifting of heavyweights.
  - Prolong working conditions demanding physical force

- **Work Organization Hazard:** Work organization hazard usually defines the issues related to the workplace such as;
  - Excessive workload
  - Inappropriate behaviour of peers
  - Bullying
  - Lack of mental support
  - Work-related stress

Fig. 6.1.2: Sources of different types of hazards

6.1.2 Hazard Identification and Risk assessment

Risk Assessment (RA) and environment review (ER) were done for hazard and environmental impact. It is done from different stages, from evaluating a new operation, modification to the existing facilities, maintenance work and others.

RA identify all safety and health hazards – Including Operational, mechanical, electrical, chemical, biological and ergonomic for ER indicate the environmental aspects and impacts taken into consideration.

Review and update of R.A and ER to be done under following circumstances: -

- Amendments/addition in legal, corporate and other voluntary requirements.
- Change in process or product handled or new developments/ modifications in activities/ products/ services.
- Occurrence of the accident, emergency
- While initiating any corrective and preventive actions
- While purchasing and erecting any new equipment/ machinery/ building

UNIT 6.2: Standard Practices and Precautions

Unit Objectives

By the end of this unit, the participants will be able to:

1. Categorize the standard precautions and practices

6.2.2 Standard Practices and Precautions

- Hand hygiene- Physical, Chemical or Biological hazard
- Usage of personal protective equipment- Safety hazard
- Respiratory hygiene/ Cough Etiquette- Biological hazard
- Sharp Safety- Safety hazard
- Safe injection practices- Biological or Physical hazard
- Sterile instruments and Devices- Biological or Physical hazard
- Avoiding ergonomic hazard

- **Hand hygiene:** Washing hands regularly is a significant step towards cleanliness, protecting us from various diseases and infections. Washing hands can keep us healthy well as it protects us from viruses capable of travelling from one person to another person. Germs and bacteria are the only host which comes from touching the nose, eyes with dirty hands, or eating/cooking food with smeary hands.
- **Usage of Personal Protective Equipment**
  - Personal protective equipment, or PPE, protects its user against any physical harm or hazards that the workplace environment may present. It is important because it exists as a preventative measure for industries that are known to be more hazardous, like manufacturing and mining. Some of the personal protective equipment are: gloves, masks and eyewear.
- **Respiratory Hygiene / Cough Etiquette:** One should follow the below guidelines to maintain respiratory hygiene.
  - Covering the mouth and nose with a cloth or elbow while coughing or sneezing.
  - Throw the used tissues in a separate bin.
  - Washing of the hands or sanitizing before touching the nose or mouth
- **Sharp Safety:** Sharp objects such as needles, lancets, and surgical knives must be handled with utmost care to prevent injury or spread of infection.
- **Avoiding ergonomic hazard:** Headsets, monitor stands, and adjustable chairs are just some devices that can be easily integrated into a workspace to diminish the risk of injury from repetitive motions. Awkward locating refers to positions in the body when a person deviates significantly from a neutral position while performing tasks.

UNIT 6.3: Uses of Electrical Equipment

Unit Objectives

By the end of this unit, the participants will be able to:

1. Examine the utilization of the electrical equipment

6.3.1 The Utilization of the Electrical Equipment

Electrical equipment is generally that equipment that requires electrical supplies for their operations. It generally consists of several small components in an enclosed form and is controlled by a power switch. It tends to include:

- Electric switchboard
- Distribution board
- Circuit breakers and disconnects
- Electricity meter
- Transformer

Fig. 6.3.1: Different type of electrical equipment's

Hazards Related to Electrical Equipment's

The five hazards described here are very common and easily preventable.

- Working on live circuits
- Skipping Lockout/Tagout. It is also known as LOTO, which disconnects electricity and avoids electrical hazards.
- Forgetting PPE.
- Improper grounding.
- Damaged extension cords.

Fig. 6.3.2: Electrical hazard symbols

UNIT 6.4: Usage of Personal Protective Equipment

Unit Objectives

By the end of this unit, the participants will be able to:

1. Explore the usage of personal protective equipment

6.4.1 The Usage of Personal Protective Equipment

Personal protective equipment is majorly used to protect oneself from serious accidents or illnesses originating from the workplace's physical, biological, chemical, and mechanical hazards.

Personal protective equipment includes:

Fig. 6.4.1: The usage of personal protective equipment

Importance of PPE in Food Industry

Protective Clothing Reduces Injury and Contamination Risks. In the food manufacturing units, workers are at a surprising risk of exposure to harsh and toxic chemicals, which can cause further contamination of the food product. Also, PPE importance can be identified during working at height to avoid slip, trip and fall.

UNIT 6.5: Organisational Protocols

Unit Objectives

By the end of this unit, the participants will be able to:

1. Recognizing the organizational protocols

6.5.1 The Organizational Protocols

Accidents are unplanned experiences resulting in injuries, illness, death, and loss of property and/or production. While there is no way to avoid accidents, some actions, plans, and preparations are capable of being taken to diminish them.

Knowledge of the Hazards

- Be aware of the environment. Look around and recognize workplace risks that are capable of causing harm.
- Look for manners to diminish or eliminate hazards and implement them.
- Report unsafe areas or practices.
- Dress for the weather.
- Use the EHS (Environmental Health & Safety) Job Hazard Analysis devices to recognize hazards linked with job sorts.

Originate a Safe Work Sector

- Keep an orderly job place. Poor housekeeping is capable of causing safety hazards and serious health. The workplace's layout requires to have accurate egress routes as well as be debris' free.
- Take breaks as well as mobilize around regularly all through the day. Short breaks (moving around and standing up) can make a big distinction in combating the threats of residing in a static position all day long.
- Pay attention to workstation ergonomics.

Use Safe Lifting Techniques

- Follow the following safe lifting practices:
    - Lift from a position of power
    - Keep the load close
    - Use a staggered stance
    - Cable/Rope/Slings in good repair
    - Hoist chain/Rope free of kinks and twist
    - Hooks not deformed or damaged and safety latches intact
    - Display of testing date, capacity and safe working load
    - Do not attempt to twist while lifting
- Training in body mechanics can reduce strain injuries and keep employees safe during moving and lifting.
- Regular Interaction
    - Notify supervisors regarding the safety hazards
    - Speaking up as well as being included in safety strategizing.
    - Constantly cultivate a safety level
- Training as well as Education
    - Make sure for everyone who possesses the appropriate safety training linking to the job's

threats.

- Take benefit of Environmental Safety and Health online training events.
- Each employee's responsibility is to take an active role in maintaining safety.

Emergency Preparedness Plan

Nowadays, many organizations, including the food industry, also implement their emergency preparedness plan, which includes hazards identified during their past years of operation; possible weather or climatic condition; spillages during operational activities, etc. Hazards can be classified as low, moderate and significant impact on the organization based on the geolocation of the unit.

Incident Reporting and Investigation

Incident

It is an event that causes damage to equipment material or other property. It may or may not be accompanied by human injury. It can be categorized as: -

- **No Injury Incident / Dangerous Occurrences**

  Fire– An incident in which a fire broke out which has the potential of causing burn injury to humans or damage to property.

  Near Miss– An incident that has the potential for causing an injury to humans or damage to property but narrowly escapes
- **Industrial / Injury incident:** An incident is a sudden and unforeseen event, attributable to any cause, which happens to the person, arising out of or in this course of his or her work and resulting in an employment injury to that person.
- **Major Incident** An incident results in a human fatality, permanent disability or extensive loss of equipment or materials.
- **Lost Time Incident**- Human injury incident prevents the person from doing his work for more than 48 Hrs.
- **Minor Incident–** An incident that causes minor injury to a human which may prevent him from undertaking his work up to 48 Hrs.
- **First Aid Case–** An injury incident that requires a person to go to a dispensary for a one-time treatment and/or any follow-up visit for observation of minor scratches, cuts, burn, splinters or other minor industrial injuries which do not ordinarily require medical care.
- **Unsafe Act:** The violation of a commonly accepted safe procedure or practice which resulted in the incident or was against the safety guidelines. Examples are operating without authority, operating at an unsafe speed, making safety devices inoperative, posture or unsafe position, failure to use personal protective equipment. Etc
- **Unsafe condition:** The condition which has the potential to cause injury/harm & damage to property material/ environment or process, improper guarding, defective tools/ equipment, hazardous arrangement or process, Improper ventilation, high temperature/dust Noise.

Incident Investigation

- Persons investigating any incident should collect all information, evidence regarding the situation under which the incident; this shall also include the condition of the persons, physical and mental conditions.
- The investigation should be based on fact-finding, and immediate causes of incidents are listed in two groups (Unsafe Condition and Unsafe Act). The investigating team shall find out and note down. The investigation team shall attempt to list all unsafe conditions and all unsafe behaviours on personnel.

UNIT 6.6: Dealing with Toxics

Unit Objectives

By the end of this unit, the participants will be able to:

1. Monitor the ways to handle the toxics

6.6.1 The Ways to Handle the Toxics

Toxics are chemical substances that can cause serious harm to the person if he/she comes directly in its contact. One should be extra careful while handling such substances and an organisation must have clear labelling, separate storage rooms and proper guidelines for its usage.

- **Exposure hazards:**
  - **Contact or Absorption:** It can cause when a person comes in direct contact with toxic substances. It can result in drying or defatting of skin, skin irritation, or redness.
  - **Inhalation** occurs when a person inhales the fumes or vapour of toxic substances. It can cause shortness of breath, sore throat, coughing, an effect on the nervous system, and irritation during the breath.
  - **Ingestion:** It occurs when people accidentally consume toxic material. It can result in diarrhoea, vomiting, indigestion, effect on the functioning of the liver and kidney.

- **Storage requirement:**
  - Toxic substances must be stored in designated storage compartments only.
  - It should be stored under the optimum condition as prescribed. Always take the material in desired quantity and never put the used or remaining material in the original container.
  - One should always look for an alternative before using the toxic agent.
  - Only authorised
  - Personnel should be given access to the storage compartment.

- **Labelling requirement:**
  - Toxic substances or materials should be labelled in clear and readable format and proper usage instructions.
  - Work areas should be labelled properly where toxic substances are used regularly or excessively.
  - Always label the emergency contact number near the storage and the work area.

- **Spill and accident procedures:**
  - In case of a spill or accident, immediately alert the people in that area and inform the supervisors.
  - Evacuate the area and seize the entry.
  - Inform the relevant authority in case of leakage or spillage in larger quantities.
  - The trained professional of designated staff should only perform cleaning of toxic spillage.
  - Usage of absorbent while cleaning the corrosive or other harmful liquid.
  - Usage of neutralizing agent while cleaning the acidic, toxic substances.
  - Never touch the toxic substance with naked hands.

- **Waste management:**
  - Toxic waste must be segregated separately in accordance with its nature.
  - It should be managed separately from other wastes.
  - Flammable chemicals, acids should be disposed of carefully and separately in order to prevent any type of accident or injury.
  - Never dispose of the toxic substance in an open area.
  - It should always be disposed of in a leak-proof and airtight container.

Fig. 6.6.1: Waste disposal process for a different type of waste

UNIT 6.7: Fire Prevention and Fire Extinguishers

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify fire prevention and fire extinguisher

6.7.1 Fire Prevention and Fire Extinguisher

Prevention from fire is necessary to avoid excessive damage. Their major goal remains to educate the workers on the ways to prevent the environment from fire.

To prevent the workplace from fire, we must enforce the following measures:

- Workers should be highly trained for the mock drill.
- No smoking signs around the highly flammable liquid and gases.

Causes of fire

- **Flammable and combustible liquids:** This requires proper storage and handling in order to prevent the occurrence of fire which must be stored under a well labelled and closed container to avoid any accident.
- **Liquified Petroleum Gases:** LPG gas has a low density and is heavier than air. It usually accumulates in low lying areas so that the workers are warned if they tend to find any leakage or hole in the cylinders. Moreover, they must not use fire; instead of that, they are capable of utilizing soapy water and finding out the bubbles.

Prevention of the Casualties from Fire

- **Fire Alarm Devices:** These are the devices used to warn people during fire and smoke or any other types of fire emergencies. These alarms are automatically activated once smoke and heat are detected. It should be installed on the telephone desk and the employer's entrance in order to evacuate promptly.
- **Fire Extinguisher:** It is a lifesaver device that is used to control small fires as well as in emergency situations. It should not be used in indented fire issues if it is reached to the walls, ceiling or where there is no route for escape.

  Placement of fire extinguishers at workplace or organization must include.

  - The fire extinguisher should always be placed or mounted on a wall and should be properly marked.
  - Employees should be well trained with PASS methods or firefighting.
  - The fire extinguisher should always be kept at the ease of location to all employees.
  - Vehicles should also carry out one ABC rated extinguisher in case of emergency.
  - All extinguishers should be well marked and labelled and should be clearly visible.
  - All extinguishers should be inspected on a monthly basis, and their place it has not tampered with.
  - For the point of safety, all extinguishers should be examined yearly or required to be refilled in order to ensure operability.
  - A tag should also be attached to ensure its maintenance or refilling date and the signature of the authorized person.

- **Fire Extinguisher Classes:** There are four types/classes of fire extinguishers, which are most common, i.e., A, B, C and D, where every class is capable of putting out a varied sort of fire.
  - Class A extinguishers would be capable of putting out fires in ordinary combustibles such as wood and paper.
  - Class B extinguishers are utilized for flammable liquids like grease, gasoline and oil.
  - Class C extinguishers are used only for electrically energized fires.
  - Class D extinguishers are used on flammable metals.

Fig. 6.7.1: Types of fire extinguishers

Uses of Fire Extinguishers

Once it is installed in the workplace or industry, it is important for every employee to get familiar with the usage and the direction of fire extinguishers so as to be well prepared for the sudden occurrence of any hazardous incidents and accidents. Fire extinguishers are relatively easy to use in case of small fires by using some simple technique called PASS.

Fig. 6.7.2: Pass technique for Fire Extinguisher use

Fire Hydrant/ Fire Hydrant Pump

Fire hydrant consists of a system of pipework connected directly to the water supply mainly to water to every hydrant outlet as well as is attempted to present water for the firemen in order to fight a fire. The water is seen to be discharged into the fire engine, from which it is then pumped and sprayed over the fire. Where the water supply is not inadequate or reliable, hydrant pumps requires to be presented to pressurize the mains of the fire.

UNIT 6.8: Artificial Respiration and CPR

Unit Objectives

By the end of this unit, the participants will be able to:

1. Evaluate CPR as well as the artificial respiration

6.8.1 CPR As Well As the Artificial Respiration

Artificial respiration and CPR is an act (or) technique used for stimulating respiration when there is a sudden stoppage of breathing or lung functioning.

Techniques used to provide artificial respiration are:

- Mouth-to-mouth breathing
- Prone-pressure method
- Cardiopulmonary resuscitation (CPR) or external chest compression

There are two types of ways to provide Artificial respiration. They are:

- Manual and,
- Mechanical

Manual ways consist of:

- Mouth-to-mouth breathing
- Prone Pressure Method
- Back Pressure Arm-Lift

Mouth-To-Mouth Breathing

The steps to perform in this specific process are:

		
Position your hand	Interlock fingers	Give chest compressions

		
Open the airway	Give rescue breaths	Watch chest fall
		
Repeat chest compressions and rescue breaths		

Table 6.8.1: CPR steps

Prone Pressure Method

This method, additionally known as the Schafer method, stands to be a type of artificial respiration which is used for a patient in case of drowning. In this, the patient is placed in a prone or placed in a face-down position allowing rhythmically pressure with the help of hand on the thorax by means of which the water present would get expelled from the lungs allowing air to enter by clearing the passage in order to breath.

Back Pressure Arm-Lift

This particular method is used as an alternative when other methods are not possible or are not working out.

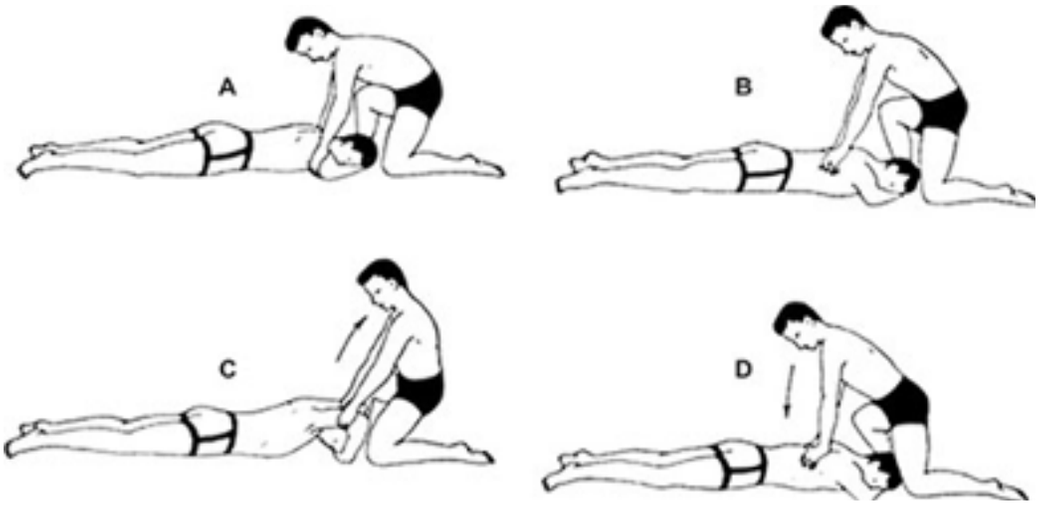

Fig. 6.8.1: Back Pressure Arm-Lift

A Mechanical Method of Artificial Respiration

These types of artificial respiration methods are generally performed by highly trained professionals such as a doctor, nurses, and paramedic forces. The mechanical method often uses machine-like ventilators. Another device that is used in the mechanical method is a bag valve mask. It has the self-inflate and deflates mechanism as well as has an air supply that is controlled by the valve.

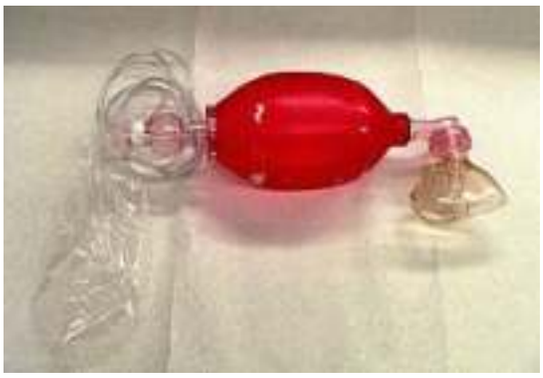

Fig. 6.8.2: Big Valve mask

Fig. 6.8.3: Ventilator

UNIT 6.9: Rescue and Evacuation In Case Of Fire

Unit Objectives

By the end of this unit, the participants will be able to:

1. Discuss the evacuation and rescue during a fire incident

6.9.1 The Evacuation and Rescue during a Fire Incident

A "Fire Emergency Evacuation Plan (FEEP)" stands a scripted document that involves the activity to be adapted by all staff in the event of a fire and the sequences for calling the fire brigade.

Staff Fire Notice High fire threats or extensive premises that would be required a more illustrated emergency evacuation strategy which takes account of the findings of the assessment of fire risk, e.g. the staff importantly at threat and their spots. In addition, notices providing transparent and concise routine's instructions to be followed in the instance of fire that requires to be appropriately showcased.

In some instances, the inidviduals requires to be nominated inidviduals in order to conducr the fire action plan as well as provide them enough training in firefighting as well as procedures for evacuation. The following items require to be taken into consideration where appropriate:

Fig. 6.9.1: Staff Fire Notice

Fire Evacuation Plan

You require taking into consideration of how you would tend to arrange the premises' evacuation in the light of your risk evaluation as well as the other fire precautions that the individuals possesses or intended to put in spot.

Simultaneous Evacuation

In most premises, the evacuation in the instance of fire would easily be by means of each one responsing to the warning signal given when a fire is discovered, then making their way, by regards of escape, to a spot of safety away from the boundaries. This is referred as a simultaneous evacuation and would generally be initiated by the sounding of the normal alarm over the system of fire warning.

Vertical Phased Evacuation

In certain larger complex premises, the emergency arrangements are designed to allow people who are not at immediate risk from fire to delay initiating their evacuation. It might be accurate to start the evacuation by initially performing the evacuation by only the sector closest to the fire as well as warning other individuals to stand by. This is generally done by suddenly evacuating the floor where the fire is spotted as well as the floor located above. The other floors are then evacuated among the individuals to neglect congestion on the escape paths. The rest of the indivdiuals are then evacuated if it is important to do so. The fire warning system requires to be capable of providing two distinctly different signals (warning and evacuation) or giving accurate voice messages. Horizontal phased evacuation in hospitals as well as care homes: the floor may be divided into a number of fires resisting compartments, and the occupants are moved from the compartment involved in the fire to the adjacent compartment as well as, if required, moved again. Depending on the fire situation, it might eventually be significant to take into consideration vertical evacuation.

Other Fire Precautions

- systems of voice alarm
- fire control points
- compartmentation of the premises using fire-resisting construction
- sprinklers in buildings where the top floor is 30 meters or more above ground standards

Staff Alarm Evacuation (Silent Alarm)

In certain instances, it might not be accurate for a normal alarm to start immediate evacuation (Cinemas and Theatres). This could be as of the number of members of the public provided and the requirement for the staff in order to put pre-arranged strategies for the safe evacuation of the premises into action. In the mentioned situations, a staff alarm is capable of being provided (by fire records, personal pagers, discreet sounders, or a coded phrase on a public address system etc.). Following the staff alarm, a more normal alarm signal is capable of being provided, as well as a phased or simultaneous evacuation initiated. The general alarm might be activated automatically if manual initiation has not taken place within a pre-determined time.

Defend in Place

This strategy might be taken into consideration in blocks of flats where each flat is a minimum 60-minute fire-resisting compartment. It might additionally be considered in hospitals or nursing homes where patients are connected to life-supporting equipment as well as is not capable of being moved. The concept authorises the occupants to stay put as well as authorise the fire facility to extinguish the fire. If the fire spreads as well as it is not capable of being controlled, then they would tend to initiate an entire evacuation. In the instance of patients connected to life-supporting equipment, a decision has to be made which choice stands to be the best, stay or move; in either manner, the patient would be at grave threat.

You should only strategise in order to utilise defend-in-place, phased evacuation schemes or a alarm system for the staff if the individuals have sought the suggestion of a competent individual as well as the fire and rescue service.

Action on Hearing the Fire Alarm

On discovering a fire, it is the duty of every person to sound the nearest fire alarm immediately. The plan should include the method of raising the alarm in the case of fire.

People, on hearing the alarm, should proceed to pre-determined positions to assist members of the public and staff in leaving the building by the nearest safe route.

Lifts and escalators should not be used due to possible electrical failure unless they are part of a Personal Emergency Evacuation Plan.

Calling the fire brigade

The Fire Service should also be informed to combat from fire.

Power/Process Isolation

Close Down Procedure – Adopt your own 'Close Down' procedure as appropriate.

Fig. 6.9.2: Fire evacuation process

UNIT 6.10: First Aid

Unit Objectives

By the end of this unit, the participants will be able to:

1. Cataloguing the first aids

6.10.1 First Aids

First aid, as the name suggests, stands to be the first and immediate care or assistance provided to the person in case of either minor, serious injury or illness. First-aid provided on time can save the life in case of life and death kind of situation as well as additionally assists to control the condition from worsening further.

First aid is often controlled by the 3 P's principle:

- Prevent further injury
- Preserve life
- Promote recovery

It is necessary that each floor or manager should have the first aid box handy with them and can be easily accessed by the employees in case of emergency or need.

Fig. 6.10.1: First Aid Kit

UNIT 6.11: Potential Injuries and Ill Health

Unit Objectives

By the end of this unit, the participants will be able to:

1. Understanding the ill health as well as potential injuries

6.11.1 The Ill Health As Well As Potential Injuries

The major role of work is based on enhancing self-esteem, wellbeing and social mobility. However, work-related accidents or illnesses can impact the employees' health in longer or shorter terms and may result in economic as well as social repercussions for the employer.

It is mandatory for an employer to have precautionary measures in place to avoid such incidents. A few common work-related injuries and illnesses are:

- **Slips, trips and falls:** One of the most common causes of injury are slippery surface, fall from ladder or height. It can be avoided through a safety grill or safety bars.
- **Muscle strains:** Muscle strain occurs at the workplace due to lifting heavy items regularly and long-standing or sitting hours. This can be prevented easily through exercise, training and guidance.
- **Being hit by falling objects:** Employees working in warehouses often encounter injuries caused by fall-ing objects. It can be controlled by providing adequate storage and encouraging staff to store the item safely.
- **Cuts and lacerations:** It generally occurs by inappropriately handling sharp objects and is capable of being controlled by delivering the proper training to the staff, wearing proper protection and providing safety equipment to the workers.
- **Inhaling toxic fumes:** Workers who are dealing with chemicals are more likely to become a victim of an injury caused by toxic materials like inhaling dangerous gases or fumes. It is mandatory for the em-ployer to provide adequate safety gear to its worker who regularly meets such kinds of substances.
- **Crashes and collisions:** It can happen in warehouses and construction sites due to vehicle movement, and prevention can be done through necessary safety measures such as PPE, sufficient light, safety alert etc.
- **Exposure to loud noise:** Industrial deafness can occur to employees working in loud noise areas, and it can be avoided by wearing earplugs or earmuffs.
- **Fights at work:** Disagreement or tension may lead to fighting at work. It is a must to have an employee grievance department in order to deal with such cases.

UNIT 6.12: Precautions in Mobility

Unit Objectives

By the end of this unit, the participants will be able to:

1. Demonstration of the precautions in mobility

6.12.1 The Precautions in Mobility

For the safety of the workers or employees at the workplace or any industry, one should always take the necessary precautions.

All manufacturing owners need to comply with the legal requirements to order to ensure that their industry and workplace is safe to work for everyone, from the customers to employees, suppliers, visitors, contractors and others.

In order to provide better productivity for a workplace, the management of the organization:

- Should minimize illness and injury of employees.
- Should reduce the risk of accidents.
- Should maximize productivity.
- Should reduce the cost of injuries and workers compensation.
- Should meet their legal requirements and responsibilities.
- Should retain their staff for better performance.

Precautions at the workplace may include.

- Keep every corner organised, clean and clutter-free
- Usage of mats on slippery floors
- Properly stored combustible material
- Ensure proper training while handling equipment and machinery

It is very important to have medical facilities and proper first aid for the employees working with heavy equipment and machinery.

1. **Clothes for each different appropriate task:** The people who are working with tools or with machinery must have proper clothing while operating the machinery. They must wear the right size of gloves according to the type of work and must wear safety shoes as well as all protective equipment while handling the tools, machinery and chemicals.

   Different industries have different types of personal protective equipment based on their mode of work. Those are:

   - **The food processing industry:** In this particular industry, they do not require special types of uniforms unless they require antibacterial head caps, clothing or aprons in order to prevent bacterial contamination.

2. **Implementation of emergency procedures:** This procedure usually contains emergencies that do not announce themselves, and there can be the expectation of fire and accidents. For this, there is a need to be prepared beforehand for such emergencies in order to ensure the safety of the employees, workers, visitors as well for business.

3. **Reduce workplace stress:** The common cause of stress during work is working for long hours, insecurity of job and conflicts between employees, which can sometimes lead to depression, difficulties during work and affects the concentration of the employees. Employers must avoid excessive workload on their employees as it may lead to employee's frustration which will provide a direct impact on employee productivity.

In order to promote a healthy and stress-free environment at the workplace, it is the employers' duty to take care of both the physical and emotional well-being of its employees by conducting regular training on time management, outdoor activities, small group discussion and many more.

UNIT 6.13: Significance of various types of hazard and safety signs

Unit Objectives

By the end of this unit, the participants will be able to:

1. Understanding the impact of various types of hazard and safety signs

6.13.1 The Impact of Various Types of Hazard and Safety Signs

Safety Hazard Significance

A hazard is a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation. Hazards may be natural, anthropogenic or socio-natural in origin.

Safety hazards are number one on the list of 6 types of workplace hazards. These hazards play an effect on employees who work directly with machinery or on construction sites. Safety hazards are the most common workplace risks. They include:

- Anything that can cause spills or trips such as cords running across the floor or ice
- Anything that can cause falls, such as working from heights, including ladders, scaffolds, roofs, or any elevated work area.
- Unguarded and moving machinery parts that a worker can accidentally touch.
- Electrical hazards like frayed cords, missing ground pins, and improper wiring
- Confined spaces.

Safety Hazards Symbol

Safety symbols, hazard symbols or safety labels are meaningful and recognizable graphical symbols that warn of or identify hazards associated with the location or item.

Fig. 6.13.1: Role of hazard in Risk assessment

Chemical Hazard Significance

A chemical hazard is a (non-biological) substance that has the potential to cause harm to life or health. Chemicals are widely used in the home and in many other places.[1] Exposure to chemicals can cause acute or long-term detrimental health effects. In the workplace, exposure to chemical hazards is a type of occupational hazard. The use of personal protective equipment (PPE) may substantially reduce the risk of damage from contact with hazardous materials.

Chemical Hazards Symbol

Hazard pictographs are a type of labelling system that alerts people at a glance that there are hazardous chemicals present. The symbols help identify whether the chemicals that are going to be in use may potentially cause physical harm or harm to the environment.

These pictographs are also subdivided into classes and categories for each classification. The assignment for each chemical depends on its type and severity.

Fig. 6.13.2: Chemical hazard safety signs

Biological Hazard Significance

Biological health hazards include bacteria, viruses, parasites and moulds or fungi. They can pose a threat to human health when they are inhaled, eaten or come in contact with skin.

Fig. 6.13.3: Biological hazard safety signs

Biological Hazards Symbol

The biohazard symbol is used or displayed only to signify the actual or potential presence of a biological hazard. Appropriate wording may be used in association with the symbol to indicate the nature or identity of the hazard, the name of the individual responsible for its control, precautionary information, etc., but never should this information be superimposed on the symbol.

Ergonomic Hazard Significance

Poor ergonomics contributes to muscle strain, muscle imbalances, and fatigue. Many muscle strains result from performing the same motion over and over again. These become repetitive stress injuries, which are some of the most common workplace injuries.

Ergonomics alone won't eliminate this type of injury. However, proper ergonomics will significantly reduce fatigue and strain.

Ergonomic Hazard Symptoms

Signs and symptoms of ergonomic injuries include pain which may be dull and aching, sharp and stabbing or a burning sensation—tingling or numbness; swelling, inflammation, stiffness. Muscle weakness or discomfort; extremities are turning white or cold.

Work Organization Hazard Significance

A few examples of work organization hazards and it is effective they are defined below.

- Falls and Falling Objects- It can result in serious injury or fatality
- Fire Hazards- It can result in loss, serious injury or fatality
- Electrical Hazards- It can result in loss, serious injury or fatality

Work Organization Hazard Symbol

There are multiple signs or symbols used in an organization to alert the people in their workstations.

Fig. 6.13.4: Work organization related hazard safety signs

Summary

- Hazard can be identified as an extended-term as it is capable of causing severe disruption to the environment or surroundings.
- Risk Assessment (RA) and environment review (ER) were done for hazard and environmental impact. It is done from different stages, from evaluating a new operation, modification to the existing facilities, maintenance work and others.
- Electrical equipment is generally that equipment that requires electrical supplies for their operations.
- Personal protective equipment is majorly used to protect oneself from serious accidents or illnesses originating from the workplace's physical, biological, chemical, and mechanical hazards.
- Accidents are unplanned experiences resulting in injuries, illness, death, and loss of property and/or production. While there is no way to avoid accidents, some actions, plans, and preparations are capable of being taken to diminish them.
- The "Occupational Safety and Health Administration (OSHA)" needs to implement the organization with a fire prevention event in order to prevent injuries and accidents from the occurrence of fire in the workplace. Prevention from fire is necessary to avoid excessive damage.
- Fire hydrant consists of a system of pipework connected directly to the water supply mainly to water to every hydrant outlet as well as is attempted to present water for the firemen in order to fight a fire. The water is seen to be discharged into the fire engine, from which it is then pumped and sprayed over the fire.
- Artificial respiration and CPR is an act (or) technique used for stimulating respiration when there is a sudden stoppage of breathing or lung functioning. It requires metabolic processes to exchange the gases which tend to be present in the body by external or pulmonary ventilation.
- Fire drills can be initiated with a defined frequency in a surprising manner to ensure employees are well aware of the fire evacuation process. Attendance can be taken in assembly points, and briefing also can be arranged to further train the staff.
- First aid, as the name suggests, stands to be the first and immediate care or assistance provided to the person in case of either minor, serious injury or illness. First-aid provided on time can save the life in case of life and death kind of situation as well as additionally assists to control the condition from worsening further.
- The major role of work is based on enhancing self-esteem, wellbeing and social mobility. However, work-related accidents or illnesses can impact the employees' health in longer or shorter terms and may result in economic as well as social repercussions for the employer.
- A hazard is a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation. Hazards may be natural, anthropogenic or socio-natural in origin.
- Poor ergonomics contributes to muscle strain, muscle imbalances, and fatigue. Many muscle strains result from performing the same motion over and over again. These become repetitive stress injuries, which are some of the most common workplace injuries.

Exercise

A. Answer the following questions briefly.

1. Is Covid -19 a biological hazard?
   A True B False
2. Which of the following is included in Personal Protective equipment?
   A Spectacles or clear goggles B Earmuffs
   C Hard hat D All of them.
3. Can toxic substances spillage be wiped off with a normal cloth and with bare hands?
   A True B No
4. A simple technique for using fire extinguisher_____.
   A. PASS method B Installation on telephonic desk
5. Which is not a part of potential injury at the workplace?
   A Muscle strain B Cuts
   C Slip or fall D Drowning

B. Answer the following questions by choosing the correct option:

1. Explain the golden rule of “First Aid”.
2. Why is Organisational Protocol necessary for an organisation?
3. Describe any two types of electrical equipment?
4. Explain why hand hygiene is necessary for oneself.
5. Describe the various types of hazards involved while handling or dealing with toxic?

Notes

NCVET

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FICSI
Food Industry Capacity and Skill Initiative

7. Working Effectively in an Organization

FIC/N9902

Key Learning Outcomes

By the end of this module, the participants will be able to:

1. Categorize the organizational policies
2. Catalogue the Legislations, standards, policies, and procedures
3. Analyse the reporting structure
4. List the inter-dependent functions
5. Discuss the impact of harassment and discrimination
6. Monitor the ways of prioritising the task
7. Record the types of communication skills
8. Evaluate the ways of carrying out teamwork
9. Highlight the ethics and discipline
10. Illustration of the grievance's solution
11. Recognize the interpersonal conflicts
12. Identify the disabilities and challenges
13. Outline the gender sensitivity and discrimination
14. Discuss the applicable legislations, grievance redressal mechanisms
15. Analyse the process of transacting with others without personal bias

UNIT 7.1: Organizational Policies

Unit Objectives

By the end of this unit, the participants will be able to:

1. Categorize the organizational policies

7.1.1 The Organizational Policies

Organizational policy or work place policy is a type of statement which provides the outlining of any organization that practices out the procedures. This eventually leads to its business which covers and everything, starting from the operations to concerns and compliances along with the employee's legislation. It also protects the organization from risks and hazards. It consists of a group of statements that could showcase the purpose for one or more guidelines and actions that are required to be taken against it in order to achieve the goals. The statements are required to be written in simple formats for providing efficiency, depending on the type of issues in which the length of policy is stated.

Benefits of Organizational Policies:

- It stands to be in line with organizational values
- It tends to have the list of complaints with the employment and associated legal requirement
- It provides proper clarity on the roles and responsibilities
- It ensures that an organization operates efficiently and in the specified business manner
- It helps in strengthening the staff position during or in the legal situation
- It enforces consistency and uniformity in the operational procedure and in the processes of decision making
- It saves time for the employees while the problems can be resolved rapidly and effectively through the existing policy

Types of organizational or workplace policies:

- Workplace health and safety policy
- Non-discrimination and anti-harassment policies
- Equal opportunity policy
- Employee code of conduct policy
- Leave policy
- Employee time-stamping policy
- Employee disciplinary and termination policy
- Employee grievance policy
- Social media policy
- E-mail policy
- Mobile phone policy
- Temporary policy

1. **Workplace health and safety policy:** It is very essential for a recruiter to provide safe and healthy work environments to their employees since the hazards might arrive without alarming anybody about the risks.
2. **Non-discrimination and Anti-harassment policy:** The principle behind this policy highlights its providing of guarantees in which human rights are exercised without any discrimination. These discriminations stand to be against individuals on the basis of their race, colour, gender, age, language, national origin, religion, gender identity, sexual orientation, property, marital status, family status, and citizenship. The proposal of this policy is mainly to inhibit any kind of harassment, whether it could be verbal or nonverbal and any kind of physical conduct which is designed to threaten the co-workers and to intimidate the employees or any person working on behalf.
3. **Equal opportunity policy:** This policy ensures that the employees are hired irrespective of their gender, religion, colour, age, caste, marital status, or physical ability.
4. **Employee code of conduct policy:** The policy sets the guidelines for all the employees and various stakeholders in which they are expected to follow in their professional and personal behaviour at the workplace.
5. **Leave policy:** This policy recognises that employees require time off from their works in order to maintain the work-life balance. It also understands the various other needs, like personal commitment, medical exigencies, relaxes time and so on of the employees.
6. **Employee time-stamping policy:** This policy describes the rules and regulations related to the working hours of an employee. It additionally assists the guidelines related to their reporting time, work duration/hours and breaks time.
7. **Employee disciplinary and termination policy:** The major objective of the mentioned policy is to define the procedures and protocols in case of any breach of the company's policy, employee misconduct or any in-disciplinary behaviour.
8. **Employee grievance policy:** The aim of this policy is to make sure that every employee has a formal way to raise their concern or complaint to their senior management. It has a clear structure and point of contact details in a case in which the employee wants to raise a concern.
9. **Social media policy:** It is expected from every employee who is engaged or involved in social media sites, like Facebook, Instagram, and Twitter, LinkedIn and several other similar platforms, to understand and follow the guidelines of the company's social media policy. This mainly stands to be the concern for the company if their action or engagement involves the company name. Failing to do so can put their employment with the company at risk.
10. **E-mail policy:** This policy describes the guidelines and uses of corporate e-mails to meet business requirements. One should follow the corporate standards, including copyrights, logos and signatures, while sending the e-mail within or outside the organization.
11. **Mobile phone policy:** This policy implies restrictions or limitations on the usage of mobile phones at the workplace.
12. **Temporary Policies:** These policies are added to the main body of company's policy guides and could be changed or removed as needed example during the COVID-19 pandemic organization implemented policy to handle social distancing, masking, disinfecting and other safety procedures for keeping employee's and workplace safe for smooth running of organization or business.

UNIT 7.2: Legislations, standard, policies, and procedures

Unit Objectives

By the end of this unit, the participants will be able to:

1. Catalogue the Legislations, standards, policies, and procedures

7.2.1 The Legislations, Standards, Policies, and Procedures

It is the legal requirement of an organisation to comply with the local laws as well as regulations and keep them updated time-to-time. The HR department is mainly responsible for continuously updating the regulations and making sure that it is communicated across the organisation. It also states that the laws and regulations of local authorities take over the organisational policy when required.

Standard practices at a workplace must have:

- Employers to define clear expectations from their employees.
- Provide a chance to utilise one's skills to perform a task.
- Support one's employees
- Motivate employees to collaborate and participate in decision making
- Welcoming nature for the feedback from the organization's employees.
- Investment in the employees learning and development process.
- Feedback received from employees and attempts to make a great workplace.

Policies and procedures at the workplace:

A policy is a general set of guidelines that are designed in line with the company's objective for dealing with an issue. Policies communicate the connection between the organization's vision and values.

A procedure sets out the specific task or action plan for implementing or carrying out a policy. Procedure tells employee's how to deal with a situation and when.

Importance of Policies and Procedure:

- It makes sure of the smooth functioning of the business and its day-to-day tasks.
- It clearly sets out the instruction for the employees which is expected from them.
- Having policy and procedure in place become handy at times while dealing with any kind of issue.
- It improves the overall image of an organisation in the market.
- It sends out a clear message to its external stakeholders and helps the organisation to build trust among its stakeholders.
- It enhances the goodwill of an organisation and, in turn, increases the market value.

The difference between policy and procedure is described below:

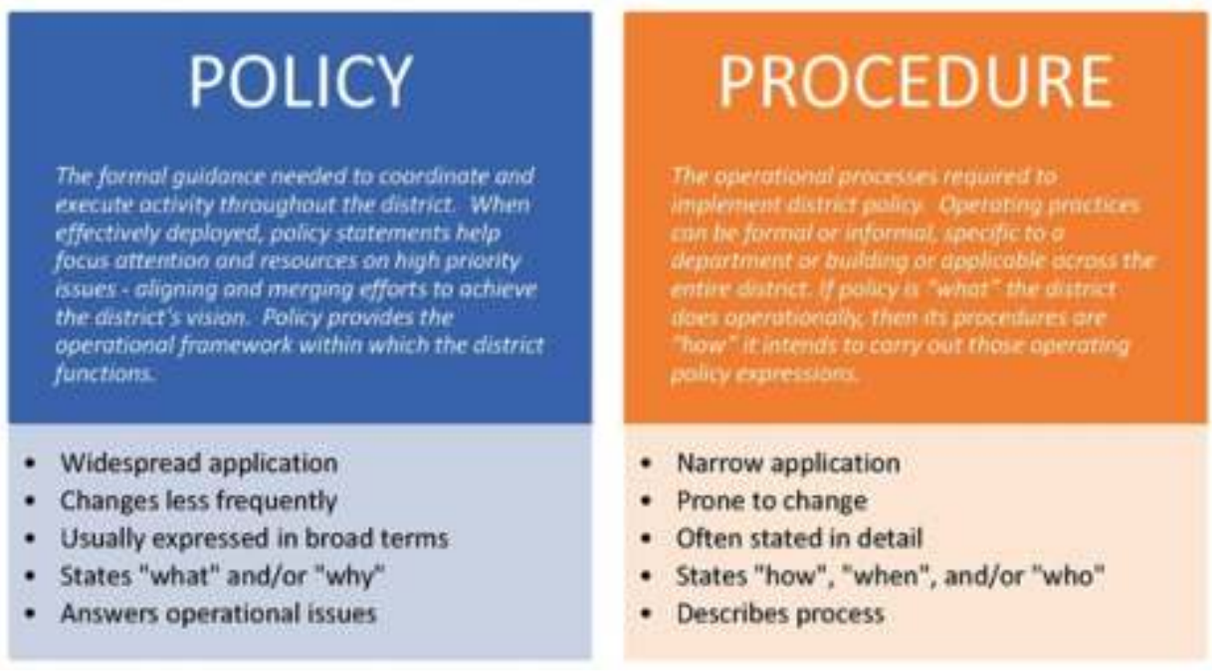

Fig. 7.2.1: Difference between Policy and Procedure

UNIT 7.3: Reporting Structure

Unit Objectives

By the end of this unit, the participants will be able to:

1. Analyse the reporting structure

7.3.1 The Reporting Structure

Reporting structure refers to the relationship between the employees' position in terms of authority –"who reports to whom". The reporting structure acts as a command it is hierarchal within every employee report to another employee who resides to be one level higher in their authority or position within the organisation including communication and decision channels.

Types of Reporting Structure

- **Vertical Structure:** The vertical organizational structure is a pyramid like top-down management structure. It creates a powerful hierarchical structure that emerges from top highest level of leadership CEO/owner followed by middle management then regular employees at bottom. Every employee has the authority to do their individual task or jobs. Every employee has to report to their supervisors in case of any issue. Here decision making often work from top to bottom, but work approval will work from bottom to top.
- **Horizontal Structure:** The flat structure or horizontal structure is an organizational structure having only a few layers of management into which the managers have a very wide span to control with one or more subordinates as it does not have many chains of command. The top layer of the structure is the owner of the business, whereas the second layer contains team leaders or managers who will report to the business owner. The third layer of team members is supervised by the team leaders or the managers of the second layer.

The company's reporting structure is generally prepared to keep the company's strategic goals and missions in mind. The authorities and work are delegated among the employees of the various departments according to various business functions.

Fig. 7.3.1: Company's Reporting Structure

UNIT 7.4: Inter-Dependent Functions

Unit Objectives

By the end of this unit, the participants will be able to:

1. List the inter-dependent functions

7.4.1 The Inter-Dependent Functions

Interdependence stands to be the key aspect of creating a healthy work environment and a sense of unity among the workers in order to achieve a common organizational goal. Teams of employees working together in hierarchy of organizational structure tend to demonstrate high chances of success rather than working individually. It also ensures the everyone is in line with the company's overall progress and are working towards the same objective.

The two main components of Inter-dependence are:

1. Collaboration
2. Delegation

Types of Inter-dependence:

- **Pooled inter-dependence:** In an organisation, each vertical or or horizontal department may not directly interact and do not directly depend on each other and perform completely separate functions having their own set of tasks, which stands to be different from each other, but they offer a contribution to the overall goal of an organisation as well. This type of inter-dependence is known as pooled inter-dependence. It means if any department fails to achieve its objective, the entire project or goal will collapse.
- **Sequential inter-dependence:** Sequential interdependence is a kind of inter-dependence when one department is witnessed to depend upon the functioning of the other department. As an instance, the procurement department must purchase the raw materials in order to ensure the proper functioning of the production department.
- **Reciprocal inter-dependence:** Similar to Sequential inter-dependence, Reciprocal inter-dependence also defines output of one department becomes input of other department in order to efficiently complete the task or project.

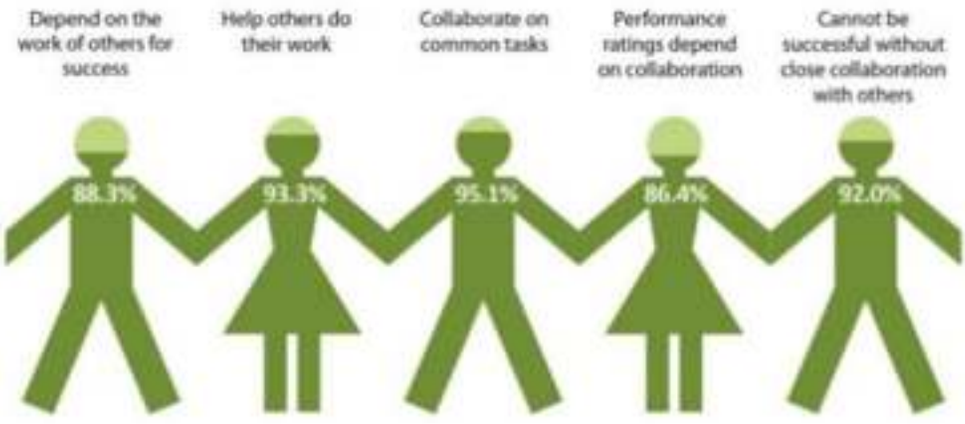

Fig. 7.4.1: Process of the concept of Inter-dependence

UNIT 7.5: Harassment and Discrimination

Unit Objectives

By the end of this unit, the participants will be able to:

1. Discuss the impact of harassment and discrimination

7.5.1 The Impact of Harassment and Discrimination

Any objectionable behaviour of someone towards an individual during professional or personal communication, whether on verbal or non-verbal terms, is referred to as harassment.

Harassment can include behaviours, such as:

- Telling abusive jokes about a particular group of members.
- Forwarding obvious or sexually suggestive emails or texts.
- Making disrespectful comments or taunts about a person's appearance and disability.
- Asking unwanted questions about someone's life.
- Displaying ethnic offensive screen savers.

Discrimination refers to a treatment when one person or a group of members are treated unfairly based on the factors such as race, colour, gender, sexual orientation, age, religion, and disability.

Discrimination that occurs in the workplace is of different types:

It occurs when an individual is discriminated against a number of factors. In addition to the reasons, job applicants and workers are also discriminated against because of their relationship with any other person.

The different types of workplace discrimination are.

- Gender Discrimination
- Age Discrimination
- Race Discrimination
- Skin colour Discrimination
- Mental and physical disability
- Genetic information
- Religion Discrimination

Pregnancy and parenthood: Harassment and Discrimination at workplace is illegal and unethical. It is not only treating your employee's equally the right thing to do but also avoiding any type of harassment and discrimination can also improve company's reputation and will also improve working environment in organization.

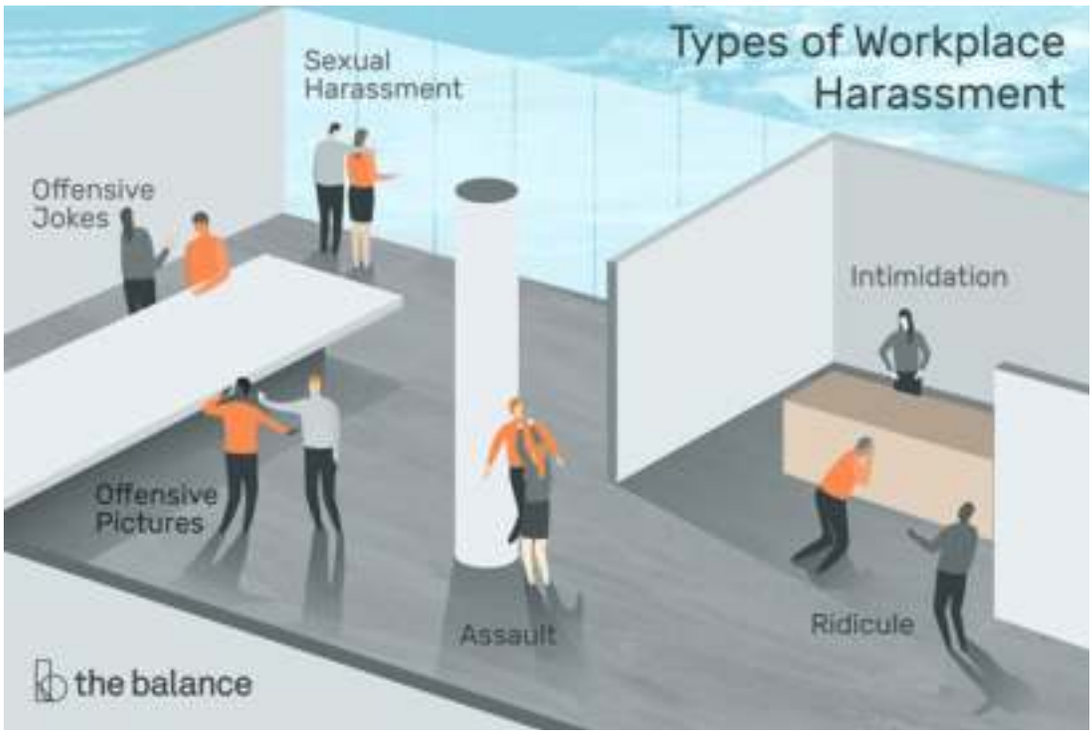

Fig. 7.5.1: Types of Workplace Harassment

UNIT 7.6: Prioritising Tasks

Unit Objectives

By the end of this unit, the participants will be able to:

1. Monitor the ways of prioritising the task

7.6.1 The Ways of Prioritising the Task

Prioritizing a task or work is a process of having an understanding of which task requires to be achieved first by determining the level of importance and urgency of task, thing or event. However, each task or work appears to be equally vital. Prioritization also helps the employees to attain more work or tasks in a less amount of time. It is very important for the employees and workers to prioritize their work in order to be productive rather than being reactive, which will indirectly decrease their efficiency of providing productive work.

How to Prioritize Task on Workplace When Everything's Important?

Seven strategies for prioritizing tasks at the workplace:

- Having a list that contains all tasks or works in one place
- Identify what's important
- Highlight what is necessary
- Prioritize based on importance
- Avoid competing with priorities
- Consideration of the efforts made in the tasks
- Constantly reviewing task and be realistic

UNIT 7.7: Communication Skills

Unit Objectives

By the end of this unit, the participants will be able to:

1. Record the types of communication skills

7.7.1 The Types of Communication Skills

Communication skill mainly addresses to the ability of the ways in order to communicate effectively with managers, colleagues and staff. It is an essential part for every industry. Communication is the act of transferring information from one place to another. It may be vocally (using voice), written (using printed or digital media such as books, magazines, websites or emails, visually (using logos, maps, chats or graphs), nonverbally (using body language, gestures, tone and pitch of voice). In practice it is often a combination of several of these. Productive communication skills in the workplace can reduce conflicts, lower the risk of projects indirectly and thus would make the work more agreeable.

In today's scenario having technical skills is not only enough to get the work done in the workplace. Completing the task must require the support of the whole team, and without proper communication, things will remain stringent in order to get better communication in the workplace. Communication skills are absolutely necessary for successful communication both in the workplace and in private life.

Fig. 7.7.1: Essential Communication Skills

Fig. 7.7.2: 7 Key Active Listening Skills

- **Body Language (non-verbal):** When there is a discussion about body language, it refers to the ways by an individual presents themselves while interacting with someone. It includes body posture, hand movements or gestures, the type of eye contact that is made, and the voice tone.
- **Listening:** Communication in the workplace is not entirely about speaking; it mainly represents atwo-way channel. Onehas to pay close attention while talking, as this allows the team members to ask and clarify their doubts as well asinquiries to ensure that they are on the same page or track.
- **Clarity and Conciseness:** One of the major ingredients for effective communication in the workplace is clarity, which mainly stands to be responsible to expresses the attempt of conveying an individual's message in the simple way possible. Before you start a conversation, type an email or being a discussion, have in mind what the purpose of the communication is and what information you hope to obtain as a result.
- **Friendliness:** In order to engage with the team members in an open or honest discussion, a person needs a friendly tone, a personal question, or simply a smile. It is important because the team members would not hesitate to contact the individual as they would be easily approachable for the conversation.

- **Empathy:** Showing compassion or empathy even when the individual disagrees with an employer, co-worker, or employee state to be very important as it helps in understanding their point of view and also respects their decision.
- **Confidence:** It is an important step to be confident when an individual tends to interact with others. As in all interactions, confidence (but not overconfidence) is crucial part. Conveying with confidence will give you peoples, faith in your abilities and will take you seriously.
- **Respect:** The employee must respect their co-workers' roles, skill set and ideas in order to meet the company's overall goal as a team.

  The team must communicate with each other in a respectful manner every time. Conveying them with respect through email by taking the time in order to edit their message is also required. If the individual would send them a sloppy written, confusing email, the recipient will think them to be disrespectful and also encourage them to think through the person's communication.

Summarizing the concept:

Effective and clear communication at the workplace ensures that the healthy work environment supports the overall team development, engagement of employees, innovative idea, which in turn help the overall company's growth, enhancing the goodwill and trust of its customers.

UNIT 7.8: Teamwork

Unit Objectives

By the end of this unit, the participants will be able to:

1. Evaluate the ways of carrying out a teamwork

7.8.1 The Ways of Carrying Out Teamwork

Teamwork is a cumulative effort done by a team or a group of members in order to acquire a common goal or to complete a given work or task in the most effective and powerful way. Good teamwork helps in building a strong relationship as well as provides morale in the workplace, which makes the workers more productive, leading to an increased profit.

Tips to improve teamwork in the organization:

- **Encourage informal social events:** In an informal environment, employees feel free to communicate with each other, and they also try to understand the personal behaviour of everyone.
- **Clarify Roles:** In order to work efficiently at the workplace, every employee should have a proper understanding of their roles and responsibilities according to their work demand.
- **Specify long-term as well short-term goals:** Specifying goals help in streamlining the communication and makes the teamwork more purposeful.
- **Reward and recognition:** It is necessary for an employer to recognise the best performing employees as it will keep them motivated and also provide a sense of accomplishment.
- **Avoid micro-management:** One of the significant drawbacks of micromanagement is that the employee tends to focus on the small or less relevant thing which they think is required to please the immediate supervisor.
- **Establish Effective Communications:** It is not necessary that an employee needs to be friends with all the co-workers, but the thing which is necessary states the establishing and practising of effective/good communication.
- **Respect Individuality:** Every individual has their own personality, skill and preferential ways of working, which is a necessity of the employer in order to recognise these.
- **Seek feedback:** Seek feedback not only from the managerial staff but also from the ground level staff in order to gain the proper insights and scopes of improvement.

UNIT 7.9: Ethics and Discipline

Unit Objectives

By the end of this unit, the participants will be able to:

1. Highlight the ethics and discipline

7.9.1 The Ethics and Discipline

Work ethics refers to the ways by which the employees govern themselves and their attitude towards their work. It also refers to morality in the workplace.

A person having a good work ethic tends to create a healthy workplace environment for him/her as well as for their fellow co-workers.

It is mandatory for an employer to develop strong work ethics among the employees. It can be done in various ways.

- Setting clear goals and objectives
- Mentoring
- Set example
- Need of right work environment
- Encourage professionalism
- Discipline
- Listen to your employees
- Feedback
- Rewards and recognition
- Remove obstacles
- Discipline at Workplace

UNIT 7.10: Grievances Solution

Unit Objectives

By the end of this unit, the participants will be able to:

1. Illustration of the grievance's solution

7.10.1 The Grievance's Solution

Grievance's Solutions

A grievance can prove to be quite harmful if not dealt with in time. It may lead to frustration among the employees, and they can start losing their trust from the employers.

Work-related grievances and complaints from staff need to be tackledwith proper care and are also known to be a time taking procedure.

It is the liability of the HR department that employee grievances are addressed quickly and in an effective manner.

There are five ways in order to address the grievances effectively:

- **Prompt and timely Action:** The staff or department expert in handling the grievances must be highly trained in managing the employee grievances effectively and in a time-bound manner.
- **Grievance acceptance:** The supervisor or expert must accept the employee grievance and also should respect their genuine feelings.
- **Collect information:** Management should not wait for the grievances to be reported. Instead, it should take preventive steps in order to avoid it. In order to curb it, the management must discuss, collect information, communicate regarding various issues at the workplace.
- **Cross verify the grievance cause:** Once the information and cause of grievance are collected about the reported incident, the information must be cross-checked from various other sources.
- **Decision making:** On successful identification of the causes, the management must develop a series of steps in order to resolve it along with the next course of action.
- **Review and implement:** The management should not wait for a longer time once they have a rational and effective resolution. It is necessary to involve the concerning employee(s) in confidence before implementing the decision.

UNIT 7.11: Interpersonal Conflicts

Unit Objectives

By the end of this unit, the participants will be able to:

1. Recognize the interpersonal conflicts

7.11.1 The Interpersonal Conflicts

Interpersonal Conflicts

Interpersonal conflicts refer to any type of conflict among two or more people. The idea mainly refers to the situation when a person or group of employees try to interfere in some other employee's work.

Ways to Resolve Conflict at the Workplace

- Communicate
- Listen carefully
- Show empathy
- Never hold back any grudges
- Effective communication skill

UNIT 7.12: Disabilities and Challenges

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify the disabilities and challenges

7.12.1 The Disabilities and Challenges

People with disabilities are far more impacted by personal and environmental barriers than normal people. By the end of this module, you will be able to get clarity on the rights of disabled people in the workplace.

These challenges to employment can range from a variety of physical and social ones. These can include:

- Physical barriers
- Nature of co-workers and stereotyping
- Communication barriers
- Policy barriers

Physical Barriers

They can take the form of structural issues in an environment that retrogrades the basic functioning of disabled people. As an instance, the lack of a wheelchair ramp or an elevator can hamper basic tasks for disabled people or not allow them access to modern equipment that would authorizethem to perform tasks.

Nature of Co-Workers and Stereotyping

Judgements and assumptions against people with disabilities are pretty much the norms of our present-day society. They tend to prevent disabled people from getting hired or having a positive experience in the workplace. For example, a person might be denied useful resources because their employer believes that they don't tend to possess a learning ability. This is common for people suffering from autism, ADHD or several other 'invisible' disabilities.

Communication Barriers

Communication barriers can create an inefficacy to effectively write, speak, read or understand the necessary requirements for a job. Some examples would involve the inability to use a phone due to hearing disability, lack of braille prints for blind people, and usage of languages that are too technical for people with cognitive impairments.

Policy Barriers

Policy barriers can also be a defining factor for the challenged people to get a job in a cooperative workplace. These include giving people not enough time to complete their tasks.

UNIT 7.13: Gender Sensitivity and Discrimination

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify the disabilities and challenges

7.13.1 The Disabilities and Challenges

Gender sensitivity has also been an ongoing dialogue inside the workplace. The workplace has frequantly been referred to as an “inhospitable place” for women due to the multiple decisions taken by the HRs (i.e., policies, decisions and their enactment, training, wage).

Ways to Build Gender Sensitivity and Eliminate Discrimination

- Recognizing the workplace’s “Gender Equality Maker (GEM)."
- By being open and informative about it
- Altering existing policies to make room for gender diversity and equality
- Strict implementation of the policies

Recognize the Workplace’s Gender Equality Maker

Being gender-sensitive is just one of the many necessary steps to be taken in order to have a gender-fluid workplace. Recognizing your company's current status in its diversity can be helpful and would point you in the right direction.

By Being Open and Informative About It

An open atmosphere in a workplace would help a company and its employees to excel in all directions. Understanding their needs and fulfilling them accordingly would help the employers and workers in a similar manner to achieve a gender-balanced environment.

For example, having group discussions with men, women, and LGBTQ+ would help people to understand their needs and concerns.

Altering Existing Policies to Make Room for Gender Diversity and Equality

The “Equal Remuneration Act of 1976” of India has prohibited differential pay to men and women employees for conducting the same work or work of the same nature.

Strict Implementation

Rules and regulations are only followed up with when implemented strictly. There are lots of rules and policies that can be put in place in order to check inequality and help a workplace to go from being gender-sensitive to gender transformative. One example which can be taken under consideration is the ensuring of nearly everyone to be confident and open to a leadership role if offered, while the otherscould portray equal pay amongst colleagues in the same position. Lastly, for sexual harassment, implementing strict rules against this kind of behaviour is paramount and shows that a corporation is heading in the right direction. Companies must realise that employees are working in a safe environment and do not need to be anxious about a harassment encounter.

UNIT 7.14: Applicable Legislation, Grievance Redressal Mechanisms

Unit Objectives

By the end of this unit, the participants will be able to:

1. Discuss the applicable legislations, grievance redressal mechanisms

7.14.1 The Applicable Legislations, Grievance Redressal Mechanisms

The Indian Constitution guarantees equality and prohibits discrimination on the grounds of religion, race, caste, sex, birthplace, and residence.

Discrimination against or profiling individuals can occur at two stages – pre-recruitment and post-recruitment. The former entails rejecting potential candidates on the basis of their gender, religion, caste, marital status, pregnancy etc. Post-recruitment discrimination manifests in lesser pay, fewer benefits and/or leave or even termination, based on the same grounds.

The Constitution guarantees equality of opportunity for every citizen in matters relating to employment or appointment to any office under the state.

“Equal Remuneration Act, 1976” needs the employers to pay equal remuneration to the employees for the same task or work of a similar nature without having any discrimination on the basis of sex.

Grievance Redressal Mechanism

A transparent, quick, robust and confidential grievance redressal system can effectively help in order to handle conflicts in the workplace and potentially go a long way in bringing harmony to the workplace. Some of the better places to work are identified to have an efficient worker-based grievance redressal mechanism.

In India, certain central and state-specific labour laws require the employer to adopt certain grievance redressal mechanisms at the workplace.

- **Internal Commite for Complaints:** According to the sexual harassment of women at workplace "(Prevention, Prohibition and Redressal) Act, 2013" of India (POSH Act), each workplace possessing at least ten employees is required to constitute an Internal Complaints Committee (IC). The IC is required to investigate complaints of sexual harassment of women at the workplace and also provide recommendations to the employers.
- **Grievance Redressal Committee:** According to section 9C of the Industrial Disputes Act, 1947 of India (IDA), each employer recruiting at least twenty workmen, is needed to structure a Grievance Redressal Committee (GRC) for resolution of the conflicts arising out of grievances of the people.
- **Works Committee:** The labour authorities might, under section 3 of the IDA, order an initiation possessing at least one hundred workmen to set up a Works Committee (WC).
- **Committee for Employee's Health and Safety:** Certain states in Indian like Maharashtra need employers to employ at least one hundred workers to structure a Health, Safety and Welfare Committee (HSW Committee). The responsibility of the HSW Committee includes surveying and identifying any accident-prone, hazardous objects or spots in the boundaries, rectifying such spots, conducting healthcare camps once a year.

UNIT 7.15: Transacting With Others without Personal Bias

Unit Objectives

By the end of this unit, the participants will be able to:

1. To administer with others without personal bias

7.15.1 Personal Bias

When it arrives at making choices at work, it's important to know they are not based on bias. It is essential for organizations to have concrete processes and procedures in place to curb unconscious bias. Nevertheless, there are many stages that can be adopted to check the biases and to create an inclusive environment for the team.

Recognizing an Individual's Own Biases

Recruitment is known to be an area where unconscious bias may come into play as it has been seen that people may unwittingly tend to favour applicants from their own familiar backgrounds.

Focusing on People

Many organizations are so focused on their processes that they lose sight of their own people. Of course, there is a requirement to find time, for example, to write reports, define job descriptions, and set up performance appraisals, but it's important that there is also the establishment of expectations communicate plans, and givingas well asreceiving feedback from everyone involved in the team.

Increasing Exposure to Biases

Many organizations assume that their policies on avoiding discrimination are robust and work well, so perhaps they fail to weed out some subtle biases. Declaration of the intentions about valuing a diverse workforce is extensively required. Saying words out loud, or writing them down, sends a clear message to everyone with whom an individual is working, as well as is involved inone's own subconsciousness.

Summary

- Organizational policy or work place policy is a type of statement which provides the outlining of any organization that practices out the procedures. This eventually leads to its business which covers and everything, starting from the operations to concerns and compliances along with the employee's legislation.
- It is the legal requirement of an organisation to comply with the local laws as well as regulations and keep them updated time-to-time. The HR department is mainly responsible for continuously updating the regulations and making sure that it is communicated across the organisation.
- Policies communicate the connection between the organization's vision and values.
- The reporting structure acts as a command it is hierarchal within every employee report to another employee who resides to be one level higher in their authority or position within the organisation including communication and decision channels.
- Teams of employees working together in hierarchy of organizational structure tend to demonstrate high chances of success rather than working individually.
- Prioritizing a task or work is a process of having an understanding of which task requires to be achieved first by determining the level of importance and urgency of task, thing or event.
- Effective and clear communication at the workplace ensures that the healthy work environment supports the overall team development, engagement of employees, innovative idea, which in turn help the overall company's growth, enhancing the goodwill and trust of its customers.
- Discipline at the workplace lays a strong foundation of trust between the employer and its employees. It includes reporting on time, maintaining decorum during working hours and at the workplace, appropriate dressing, proper communication, etc.
- A grievance can prove to be quite harmful if not dealt with in time. It may lead to frustration among the employees, and they can start losing their trust from the employers. In order to handle grievances properly, one should have an adequate set of procedures that lays out a clear step by step process in order to deal with the grievances.
- Women have been witnessed to have fought for their rights and for their place in this world for hundreds of years. However, it's not just women now, and the LGBTQ+ communities are also fighting for their rights and their voices in order to be heard.
- The Indian Constitution guarantees equality and prohibits discrimination on the grounds of religion, race, caste, sex, birthplace, and residence.
- A transparent, quick, robust and confidential grievance redressal system can effectively help in order to handle conflicts in the workplace and potentially go a long way in bringing harmony to the workplace.
- Recruitment is known to be an area where unconscious bias may come into play as it has been seen that people may unwittingly tend to favour applicants from their own familiar backgrounds. But a person can take practical steps in order to reduce this bias.

Exercise

A. Answer the following questions briefly.

1. Which policy stands to be the workplace or organizational policy?
   A. Social Media Policy B. Environment Protection Policy
2. _____ at workplace lays a strong foundation of trust between the employer and its employees/
   A. Communication B. Discipline
3. _____ can prove to be quite harmful if not dealt in time.
   A. Actions B. Grievance
4. The employment barriers might include:

A. Communication barriers B. Disciplinary barriers

5. _____ requires employers to pay equal remuneration to the workers.

A. Equal Remuneration Act, 1976 B. Republic Act No. 9710

B. Answer the following questions by choosing the correct option:

1. List down the importance of having the company policies in force.
2. State the differences between policies and procedures.
3. What do you understand by communication skills?
4. What are policy barriers?
5. What are some of the central and state-specific labour laws in India for focusing on the grievance redressal mechanism?

Notes

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MINISTRY OF SKILL DEVELOPMENT
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N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

FICSI
Food Industry Capacity and Skill Initiative

8. Material Conservation

Unit 8.1 - Material Handling

Unit 8.2 - Workstation Layout, Electrical and Thermal Equipment

Unit 8.3 - Organisational Procedures for Minimising Waste

Unit 8.4 - Practices of Efficient and Inefficient Management

Unit 8.5 - Material and Water Usage

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Key Learning Outcomes

By the end of this module, the participants will be able to:

1. Identify the ways to handle materials.
2. Categorize the workstation layouts, electrical and thermal equipment.
3. List the organizational procedures for minimising waste.
4. Analyse the practices of efficient and inefficient management.
5. Discuss the material and water usage.

UNIT 8.1: Material Handling

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify the ways to handle materials

8.1.1 The ways to Handle Materials

Material handling

Material handling is also known as the integrated system, which involves such activities of the movement, storage, protection and control of types of materials and products throughout the manufacturing, distribution, consumption and disposal. The major function involves the focus on methods, mechanical equipment, and related control systems to achieve the mentioned functions.

The fundamental objective of using material handling is to ensure that the material is in the right amount and is safely delivered to the desired place at the right time, along with minimum production cost. The cost of material handling has an estimated 20-25% of total manufacturing labour cost.

Principles of Material Handling

- **Planning:** The planning requires to be done in order to achieve the approach of the team with the input of consultants, suppliers and the end-users, from the management, engineering, operations, finance, sales and operations.
- **Standardization:** All the material handling equipment, methods, controls, and software requires to be standardized in such a way that it would be able to perform a wide range of tasks in a broad range of operations.
- **Work:** In material handling, the process requires to be clarified by reducing, shortening and eliminating in order to remove the unnecessary movement that would impact productivity.
- **Ergonomics:** Work and work-related conditions are being adapted to support the ability of a worker, which reduces the repetitive and difficult manual labour as well as safety.
- **Unit Load:** Due to the less use of effort and work required to move several individual items together as a single load (e.g., moving of many items one at a time), a unit load such as containers or pallets is required to be used.
- **Space Utilization:** In order to maximize the effective use of space within a facility, it is extensively crucial to keep the working stations organized and clutter-free to increase the density and availability of the storage area. 5S principle can be implemented for space utilization 5S stands for the 5 steps of this methodology: Sort, Set in Order, Shine, Standardize, Sustain.
- **System:** In material handling, the movement and the storage are required to be coordinated throughout the process in order to form or receive the inspection, storage, packaging, order selection, production, and shipping, return handling, as well as transportation.
- **Environment:** Energy, which is used in potential environmental impact, have been considered in designing the system with recycling and reusability processes implemented whenever possible, as well as for the establishment of practices for safe handling of hazardous materials.
- **Automation:** To develop operational efficiency and consistency, the automated material handling technologies need to be positioned whenever possible.

- **Life Cycle Cost:** For all the equipment used in material handling for a specified system, the analysis of a life cycle cost is required to be conducted. The areas of considerations require possessing the installations, programming, training, operation, maintenance and also repairing.

Material Handling Equipment

The simplest shelf to the most complex light out facilities, warehouse mechanization, is capable of being operated in the dark as it uses a lot of material handling equipment.

There are different kinds of material handling equipment, and they fall under four broad types. Material handling is the unloading and loading or movement of goods within a warehouse, especially with the help of mechanical devices. Thus, material handling equipment refers to the devices that are used in a warehouse's operation by storing and moving the goods.

Type 1: Storage and Handling Equipment

This stands to be usually the simplest type of material handling equipment which includes shelves and racks where an individual is capable of storing their material in the middle of shipping and receiving it. Drawers, bins, flow racks, cantilever racks and stacking frames are additionally included in this category.

Type 2: Bulk Material Handling Equipment

It is the process of storing, transportation and control of materials in loose bulk form. For instance, a silo, a large cylinder that is capable of holding stuff like grain. Other examples include:

- Reclaimers and Stackers:
- Hoppers
- Conveyor Belt
- Grain Elevators
- Dump Trucks
- Rotary Car Dumper
- Screw Conveyor
- Bucket Elevators
- Vacuum lifter

Type 3: Industrial Truck

These are the type of equipment or vehicles that is used to move materials. Sometimes it is run by workers, and sometimes they are automated. "Automated Guided Vehicles (AGVs)" fall under both industrial trucks and engineered systems. Other examples include:

- Forklifts
- Order Pickers
- Hand Trucks
- Pallet Trucks

Type 4: Engineered System

It is the type of material handling equipment that stands to be a more complicated system with multiple components, which are usually automatic. They include AGVs, conveyor belt or robotic delivery system that comes in different sizes and shapes or automated storage systems.

8.1.2 Hazards, Risks and Threats Associated with Handling Different Materials

There are multiple hazards, risks and threats can be identified during receiving, loading & unloading, storage, and transportation for handling different types of materials.

Receiving

Hazards, risks and threats can be identified during receiving of the material. Inspect incoming materials as soon as they are received to ensure established specifications such as product temperature, packaging conditions, etc. are met. A designated employee should verify and document:

- Incoming raw materials – Quality and other kinds of defects can occur during receiving of incoming materials. So, all kind of material should be from an approved supplier. Approved supplier can be verified through supplier visit, document verification and certification from legal bodies.
- Cleanliness of the truck – Foreign body, pest can be identified as a hazard. So, we must ensure that no foreign material, dirt, odours, rodents, insects or other pests are there in the vehicle.
- Temperature of the truck – Every different material requires different type of temperature requirements such as ambient (Normal temperature- 20-25°C), chilled (0-5°C), frozen (-16°C to -23°C) and dry items. Any deviation of temperature requirements can be considered as a hazard. Proper temperature needs to maintain for products according to specifications.
- Condition of door seals – Improper door closing, or door gaps of the vehicle can be one of the risk factors of material. So, it needs to ensure that close-fitting doors with no spaces at sides or bottom.
- General truck conditions or Material handling equipment's – Truck or material handling equipment's can be cause damage of product, infrastructure damage and injury of the person or even fatality.

Loading and Unloading

Loading and unloading process can be considered as hazard due to the potential risk involved to the product, property and person.

- Product damage and spillage can happen during loading and unloading process and it can be considered as a risk.
- Human error during loading or unloading process can cause damage to product, property or the employees. Employees responsible for loading and unloading materials should follow company standards for hygiene and sanitation practices.
- Proper product temperature must be maintained during loading and unloading as well. Movers should be aware of the product temperature requirements. Any kind of deviation regarding temperature can cause product damage. Document verification plays an important part for tracing shipments in case of a recall and should include: Time of receipt, type of product, ingredient and product packaging, labelling, lot number, pallet tag, quantity, size and weight.

Storage

Products should be stored adequately to maintain package/pallet integrity:

- Allow maximum air circulation and stock rotation. Air circulation is important to maintain the temperature, humidity inside the warehouse. Also, HEPA (High efficiency particulate air) filter can be installed to avoid biological hazard.
- Assign different storage areas for different products (ingredients, raw materials, finished products) to avoid cross contamination.

- Material should be used within the manufacturer's specified time period to maintain shelf-life requirements. Appropriate rotation of food and packing materials -- first in, first out (FIFO) -- helps minimize product contamination, damage and spoilage. Allergen control precautions need to establish for food industry regarding raw materials purchasing, transportation and storage Ensure suppliers have documented and implemented an allergen control plan. Check labels on incoming ingredients to ensure supplier has not sent the wrong product, a substitute product or used the wrong label. Ensure vehicles and shipping containers are cleaned before shipping. Clearly label raw materials to indicate they contain food allergens (ex: color-coded containers, tags).
- Pallet used to store materials can cause different hazards. For example- Damage pallets can result into product damage or fall down of the product; Protruded nails can product damage or injury.
- Loading strength and design should be based on Health and safety risk assessment. Major accidents can happen due to excessive product storage on each rack or improper design of racking system.

Transportation

Vehicles and containers that transport materials should be used only for the intended purpose and should have both sanitary design and pest control procedures in place. (Ex: truck's doors should be sealed to prevent entry of pests.) Refrigeration equipment in vehicles and temperature measuring devices should be calibrated and in good working order. Mechanical refrigeration should be provided for perishable food products such as meat, fish, poultry, milk and eggs.

Inspection of vehicles

Designated employees should evaluate and document the condition of trucks, containers and carriers of finished products before loading. The following should be verified before loading:

- Cleanliness of the truck should be maintained to avoid any physical, chemical or biological hazards.
- No odours or obvious dirt or debris.
- No evidence of chemical contamination such as fluids, powders, chemical residues
- Correct temperature in the truck.
- Temperature measuring devices will work properly during transportation. Documentation and maintain a log to verify inspection and cleaning tasks. Indicate type of loads, cleaning and sanitation procedures, inspections, etc.

UNIT 8.2: Workstation Layout, Electrical and Thermal Equipment

Unit Objectives

By the end of this unit, the participants will be able to:

1. Categorize the workstation layouts, electrical and thermal equipment

8.2.1 The Workstation Layouts, Electrical and Thermal Equipment

Workstation Layout

Workstation or workplace is also known as the floor space occupied by the workers, as well as by the machines or a group of machines. An ergonomic workplace is a scientific discipline that is concerned with improving the productivity, health, comfort and safety of people in order to promote effective interactions among people, the environment and technology.

During the design of the workstation layout, the following space requirements are taken into considerations:

- Requires having spaces for racks, bins and conveyor stations that either contain the under processed work or receive the work after it has been completed by the machine.
- There should be a rectangular space occupied by the length and width of the machine or group of machines. They need to include the space for the travel of moving parts as well as the projected parts of machines which include shafts, levers, pulleys, handles and wheels.
- There requires being a proper workspace for the workers in order to efficiently complete their tasks.
- Requires having clearance space for feeding the work on and off the machine.
- There needs to be a space for tool racks, workbenches, etc., required by the individual machine, if any.
- There needs to be proper floor space for the power source, or if in case of any electric motor, it has to be placed on the floor or within the working area.

Storage Space Requirement

In any plant layout, the space for workstations allocation requires to be made for the storage of material and space essentially required inside the plants. Every department and area need to be designed in such a way so that they are capable of providing waiting, processing and moving facilities.

The storage space requirement depends on various factors such as:

- Quantitative use of raw material per hour
- Movement of semi-built parts between two machines depending upon the weight and volume.
- Movement of parts between the departments, depending upon the weight and volume.
- The dependence upon the scrap weight and volume
- Vertical heights of the building plants.
- Production capacity of the assembly.

- Floor load-bearing capacity.
- Storage practices.

Once the space requirement for all machines has been estimated, the employer needs to have the provision for the basic amenities like canteen, drinking water, first aid, restrooms, sales department, changing room (for factory worker like machine operators), refreshment place, etc.

Workplace Layout Design:

Employee productivity stands to be directly in proportion to workplace conditions. A good and comfortable workplace always results in high productivity per employee.

Some important aspects which need to be considered while designing the workplace are:

- Cleanliness
- Proper lighting
- Noise
- Too ls and Material positioning
- Chairs and Workbench
- Machine design

Electrical and Thermal Equipment

In order to build an efficient workplace layout, one needs to consider the electrical and thermal requirements of the workers. Workstations that are well equipped with electrical supply takes care of the power source needs of employees in order to operate the required equipment and tools.

The following points require to be considered while designing an electrical workstation.

- Placement of electricity outlet or strips
- Power/voltage requirement of different equipment
- The number of power outlets required
- Alternative or emergency power source outlets

UNIT 8.3: Organisational Procedures for Minimising Waste

Unit Objectives

By the end of this unit, the participants will be able to:

1. List the organizational procedures for minimising waste.

8.3.1 The Organizational Procedures for Minimising Waste

Types of organisational waste and ways to minimise them:

- **Transportation:** Transportation waste refers to the movement of tools, equipment, inventory, raw material, people etc., more than the actual requirement or consumption. Unnecessary or excessive movement of resources leads to unnecessary work, increased wear and tear, increased damaged and defects.

  In order to curb this type of waste, the department which works closely needs to be designated next to each other. The materials required for production has to be placed in easy to reach locations as well as the multiple handling of material needs to be avoided.

- **Inventory:** Inventory is often considered as an asset to any organisation; however, storing inventory stands to be more than the required leads to unnecessary damage, defects and increased lead time during the production process. The main cause of this is over-purchasing of raw material, increased WIP (work in progress) and over-production in comparison to the actual customer needs.

  Measure to be taken in order to reduce such kind of waste involves the purchase of raw material as per the demand, avoid overproduction and reduce the work in progress.

- **Motion:** This includes unnecessary movement of tools or equipment, machinery or people. It also includes repetitive movement that doesn't add value to the work or customer, reaching for raw material, unnecessary walking to fetch tools or equipment and readjusting of installed machinery.

  Measures to be taken in order to reduce such kind of waste include a well-designed workplace, easy to reach location for tools or equipment, and efficient one-time installation of machinery.

- **Waiting:** It includes equipment or machinery which are kept idle and also the workers waiting for material or equipment. It is majorly caused by unevenness among the various production lines.

  This type of waste is capable of being curbed by streamlining the process for continuous workflow as well as training the workers on multiple skills set who are capable of easily adapting to the changing work demands and standardized workflow.

- **Overproduction:** Overproduction means manufacturing a product or material in excessive quantity than the actual demand.

  Measures to be taken in order to reduce such kind of waste include, even manufacturing rate between the station or production units and also manufacturing small batch size.

Fig. 8.3.1: Overproduction

- **Defects:** A defect usually refers to a specific product that is of no use. This results in either discarding the product or reworking on them and is capable of incurring the additional operational cost.

Tips

- For having an effective system of food processing implementation of automated statistical process control systems are extensively required
- Maintaining a high level of supply chain visibility is also considered to be important for efficient food processing

UNIT 8.4: Practices of Efficient and Inefficient Management

Unit Objectives

By the end of this unit, the participants will be able to:

1. Analyse the practices of efficient and inefficient management

8.4.1 The Practices of Efficient and Inefficient Management

Inefficient Management Practices

Inefficiency at the workplace often refers to low productive and poor confidence. Inefficiency directly impacts the cost incurred by any organisation.

Following are the key indicators of inefficient management:

- Uneven prioritization of work
- Non-essential work
- Lack of resource planning
- Improper justification of resources
- Inefficient productivity management
- Lack of fruitful collaboration

An efficient manager must answer the below questions in order to identify the inefficient management practices.

1. Who is working on what?
2. Are they working on the highest priority projects?
3. Do they have the resources they need?
4. Do they have the information they need?
5. How is work coming along?
6. Will work be done on time?

Efficient Management Practices

An efficient management practice refers to those practices which can perform the task with minimal wastage of resources. It also refers to the appropriate utilisation of resources leading to profit maximisation. The basic rules of effective management are:

- Consistency
- Goal setting
- Delegation
- Task prioritization
- Effective communication
- Rewards and Recognition
- Training and development
- Management Commitment

UNIT 8.5: Material and Water Usage

Unit Objectives

By the end of this unit, the participants will be able to:

1. Discuss the material and water usage.

8.5.1 The Material and Water Usage

Material Usage

Material refers to those components or raw goods which are used in producing hard goods like machines and equipment for another industry or end consumer as well as soft goods like food items, chemicals, medicines, apparel, etc.

Water Usage

In manufacturing units, water is used for various purposes like fabrication and processing of various materials, cleaning, diluting or as a coolant.

The need and demand for industrial water vary upon the product which is being manufactured. The other factors which need to be taken into consideration are water quality in the region, type of treatment required in order to make water usable.

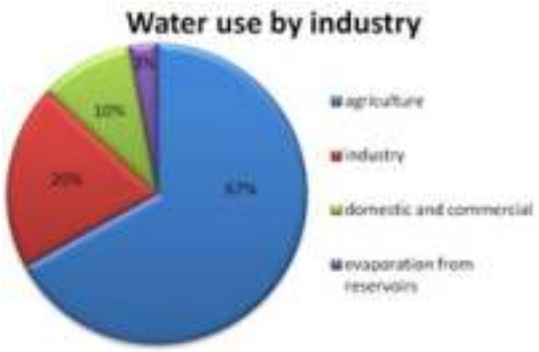

Fig. 8.5.1: Industry-wise water consumption

Industrial usage of water:

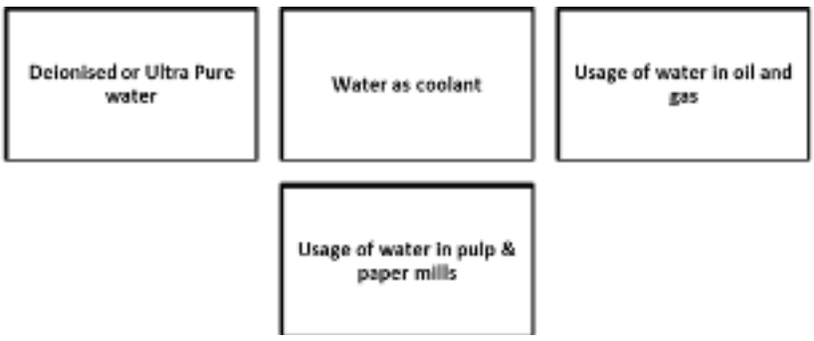

Fig. 8.5.2: Industrial wastage of water

Summary

- Material handling is also known as the integrated system, which involves such activities of the movement, storage, protection and control of types of materials and products throughout the manufacturing, distribution, consumption and disposal.
- Workstation or workplace is also known as the floor space occupied by the workers, as well as by the machines or a group of machines.
- Employee productivity stands to be directly in proportion to workplace conditions.
- An efficient management practice refers to those practices which can perform the task with minimal wastage of resources.

Exercise

A. Answer the following questions briefly.

1. What is the manufacturing labour cost for material handling?

A. 20- 23% B. 20- 25% C. 20- 30% D. 20- 35%

2. What stands to be the full form of AGV?

A. Automated Guided Vehicle

B. Activated Guided Vehicle

C. Accurately Guided Vehicle

D. Action Guided Vehicle

3. _____ is the major component for manufacturing semiconductors and chips, which are widely used in mobile phones, computers and various other electronic goods.

A. Nitrogen B. Silicon C. Hydrogen D. Lithium

4. _____ directly affects the efficiency of the workers.

A. Proper lighting B. Noise C. Cleanliness D. Machine design

5. The appropriate temperature at the workplace usually requires being at _____ degrees Celsius.

A. 22

B. 30

C. 18

D. 16

B. Answer the following questions by choosing the correct option:

1. What are the key indicators of inefficient management?
2. What are the four ways to control the defects types of waste?
3. What are the points required to consider while designing an electrical workstation?
4. What are the important aspects which need to be considered while designing the workplace?
5. What are the requirements for a storage space?

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9. Energy and Electricity Conservation

FICSI
Food Industry Capacity and Skill Initiative

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Key Learning Outcomes

By the end of this module, the participants will be able to:

1. Define electricity
2. State the basics of electricity
3. Identify the energy-efficient devices
4. Explain the standard practices to be followed for conserving electricity
5. Illustrate electrical equipment and appliances

UNIT 9.1: Define Electricity

Unit Objectives

By the end of this unit, the participants will be able to:

1. Define electricity

9.1.1 Definition of Electricity

Electricity stands to be a general form of energy observable in a positive and negative form that takes place naturally (as in lightning) or is generated (as in a generator), as well as that is expressed in terms of movement and interaction of electrons.

The existence of an electric charge, which is capable of being either positive or negative, creates an electric field. The movement of electric charges leads to an electric current which further generates a magnetic field.

It is at the heart of many of our present era technologies, being utilized for:

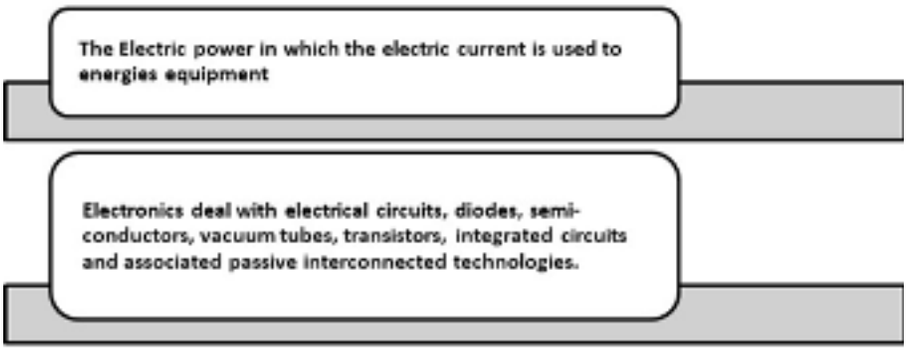

Fig. 9.1.1: Electricity utilization

UNIT 9.2: Basics of electricity

Unit Objectives

By the end of this unit, the participants will be able to:

1. State the basics of electricity

9.2.1 The Basics of Electricity

Electricity is easily put in the flow of electrons in a conductor. Electric current flows in the form of free electrons; thus, the greater the number of free electrons in a material, the better would stand to be its conductivity. On the basis of conductivity, these 'materials' can be classified into three categories:

- **Conductors –** Materials whose conductivity lies between 104 to 107-ohm m. For example, Iron, Copper, etc.
- **Semi-conductors –** Materials whose conductivity lies between 10-6 to 104-ohm m. For example, Graphite, Silicon, etc.
- **Insulators –** Materials whose conductivity lies between 10-20-to-10-10-ohm m. For example, Paper, Glass, etc.

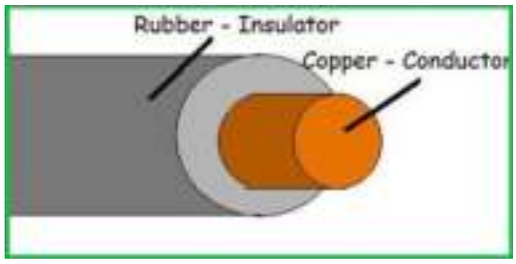

Fig. 9.2.1: Conductor of Electricity

There are three primary electrical parameters:

- Volt
- Ampere
- Ohm

Volt: The amount of external force exerted on free electrons is known as "Electromotive Force (EMF)". Volt is the amount of EMF needed to push a current of one ampere through a conductor with the resistance of one ohm.

Ampere: Ampere defines the rate of flow of electric current. For example, when one coulomb of charge flows through a given point on a conductor in a second, it is defined as a current of one ampere.

Ohm: Ohm is the unit of resistivity of a conductor. Three factors determine the resistivity of a conductor:

- Size of conductor
- Composition of conductor
- Temperature of conductor

UNIT 9.3: Energy efficient devices

Unit Objectives

By the end of this unit, the participants will be able to:

1. Identify the energy-efficient devices

9.3.1 Energy-Efficient Devices

The use of energy– efficient devices has proved to be an effective strategy for the economics and planet as a whole, as it cuts down on unnecessary power consumption while also being cost-effective.

From the viewpoint of an energy consumer, the main motivation for saving energy is frequently and simply saving money by decreasing the cost of purchasing energy. From an energy policy viewpoint, there has been a long trend in wider recognition of efficient energy as "first fuel" (meaning the ability to avoid consumption of fossil fuels for energy production).

Fig. 9.3.1: Energy-efficient devices

Energy-Efficient Devices

Devices like LED bulbs, fluorescent lighting or natural skylights reduce the amount of energy required to attain the same amount of illumination compared to using traditional incandescent light bulbs. Modern appliances such as freezers, dishwashers, ovens, stoves, dryers use significantly less energy than their previous generation models and line-ups. For example, modern energy-efficient refrigerators use 40% less energy than their conventional models did in 2001.

Energy Conservation

Energy conservation is broader in comparison to energy efficiency in including active efforts to decrease energy consumption. For example, through behavioural change it has an addition to using energy effectively. Energy conservation is a challenge requiring stringent policy programmers, technological development and behaviour change to go hand in hand. Many energies intermediary organizations, government, non-government, regional, local or at the national level, are working in order to meet this challenge.

9.3.2 Common Ways to Identify Electrical Problems

Electricity appears to be something most of us understand it for granted. When the individuals need it, you turn to the nearest switch or outlet, and there it is, ready to serve you 24/7.

Yet that electric energy faithfully facilitating us is additionally a potential destruction's source.

Several electrical fire dangers are hidden within the walls of your house or offices or other workplaces. Nevertheless, if the indivdiuals have the knowledge the ways to point the warning signs, the individuals are capable of making proactive — and less expensive — repairs that will also help protect your home in the long run. Here are certain manners to spot common issues and what to do about them.

- **Unknown odour:** When you detect an odd smell arriving from an electrical store, unplug anything linked to it, as well as don't utilise it again until a qualified electrician has tended to check it. In addition to this, if the individual's breaker panel or fuse box is emitting an odd odour, call an electrician immediately.
- **ARC faults:** Arc faults tend to take place when an electrical circuit veers off its intended path, frequently via a breach in the wiring. Arc faults stand to be preventable via the installation of a tool referred as an arc-fault circuit interrupter (AFCI).
- **Sparking or warm switches and outlets:** If the individual's light switches stand to be warm to the touch or an store is sparking, call a expertised the electrician immediately to see if your wiring needs repairs or the fixture should be replaced.
- **Buzzing sounds:** If you hear any buzzing, cracking or sizzling sounds when you flip a switch or plug into an outlet, turn off the power to that fixture immediately and consult a professional electrician.
- **Flickering lights:** Flickering lights usually indicate a power surge. These power surges don't necessarily have to come from a catastrophic event — more than likely, your appliances are making demands on the electrical system that it cannot handle.
- **Broken light switches and loose outlets:** If switches or outlets stop working or work only intermittently, it could be a sign of loose wiring — and another potential fire hazard. Loose outlets also create a potential for electrical shock.
- **Hot ceiling fixtures:** Occasionally check the area around your ceiling fixtures for warmth that could indicate a lack of sufficient insulation. Also, exceeding recommended bulb wattages can cause overheating. Either issue poses a potential fire hazard. Consider switching to compact fluorescent light (CFL) or light-emitting diode (LED) bulbs as these don’t produce as much heat as incandescent bulbs.
- **Circuit breaker problems:** Circuit breakers are designed to trip when a circuit is overloaded. Tripping prevents overheating and eliminates fire hazards. Occasional tripping probably indicates a simple overload, but if it occurs repeatedly, you need to call in an electrician and have them evaluate your entire electrical system.

UNIT 9.4: Standard Practices for Conserving Electricity

Unit Objectives

By the end of this unit, the participants will be able to:

1. Explain the standard practices for conserving electricity

9.4.1 Standard Practices for Conserving Electricity

Renewable energy sources have received plenty of attention in recent years, but the conservation of electricity is also important for sustainability. Nevertheless, the best results are acquired when clean power is combined with energy conservation, reducing the pressure to invest in newer infrastructure.

Environmental Reasons to Conserve Electricity

All systems of power generation have an environmental influence that must be taken into consideration before an investment decision. This is evident while dealing with fossil fuels since their combustion emits a constant stream of greenhouse gases in the atmosphere. The process of construction also has an environmental impact. Some waste materials are unavoidable, heavy machinery releases emissions and the ecosystem is seen to be disrupted.

Practices for Saving Electricity

For an average consumer, saving electricity can be good for the pocket and in turn, it reduces the increasing stress on the environment. Those savings can be diverted to alternative sources of energy like solar panel arrays, especially in a tropical country like India, where seasons are relatively moderate and 'timed'. Some practices and habits changes which would help in saving electricity are:

- Turning down the refrigerator
- Usage of energy-efficient LED bulbs
- Air drying the dishes and clothes
- Cooking under the right-sized burner
- Washing clothes with cold water
- Using window shades to alter sun rays entering the house
- Turning off electrical appliances, fans, lights when not in use
- Using low flow faucets and showerheads

Summary

- Electricity is a basic form of energy observable in a positive and negative form
- The main motivation for saving energy is frequently and simply saving money by decreasing the cost of purchasing energy.
- Energy conservation is broader in comparison to energy efficiency in including active efforts to decrease energy consumption.
- Renewable energy sources have received plenty of attention in recent years, but the conservation of electricity is also important for sustainability.
- All systems of power generation have an environmental influence that must be taken into consideration before an investment decision.
- Electrical equipment involves any machine powered by electricity.

Exercise

A. Answer the following questions briefly.

1. On the basis of conductivity, conductors possess:

   A. Materials whose conductivity lies between 10-6 to 104-ohm m

   B. Materials whose conductivity lies between 104 to 107-ohm m

   C. Materials whose conductivity lies between 10-20-to-10-10-ohm m

   D. None of the above

2. What is the full form of EMF?

   A. Electromotive Force

   B. Electromagnetic Force

   C. Electro mobile Force

   D. Electro massive Force

3. _____ energy sources have received plenty of attention in recent years, but the conservation of electricity is also important for sustainability.

   A. Renewable

   B. Non- renewable

   C. Sustainable

   D. Non-sustainable

4. Energy _____ is broader in comparison to energy efficiency in including active efforts to decrease energy consumption.

   A. Release

   B. Emission

   C. Conservation

   D. Deletion

5. Modern energy efficiency refrigerators use _____ less energy than their conventional models did in 2001.

   a. 50%

   b. 40%

   c. 60%

   d. 90%

B. Answer the following questions by choosing the correct option:

1. What are the classifications for the materials of electricity?
2. What are the three primary electrical parameters?
3. What are the components of electrical equipment?
4. What are the categories of appliances?

Notes

Notes

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10. Waste Management and Recycling

Unit 10.1 - Types of waste

Unit 10.2 - Waste Management and Disposal Solutions

Unit 10.3 - Pollution and Remedies

SGJ/N1702

Key Learning Outcomes

By the end of this module, the participants will be able to:

1. List the types of wastes
2. Describe waste management and disposal solutions
3. Explain pollution and its remedies

UNIT 10.1: Types of waste

Unit Objectives

By the end of this unit, the participants will be able to:

1. List the different types of waste

10.1.1 The Different Types of Wastes

Unwanted, trash, rubbish, excess, superfluous, scrap, extra, rework, unused- there are so many synonyms for waste.

There are different types of waste which are recyclable or non-recyclable. Recycling of waste depends on the scientific progression as well knowledge about different kind of waste handling. Below are lists of different type of waste.

Recyclable waste	Non-recyclable waste
1. Concrete 2. Steel 3. Aluminium 4. Plastic (PET) 5. Newspapers 6. Corrugated Cardboard 7. Plastics (HDPE) 8. Glass 9. Mixed Papers 10. Used Motor Oil 11. Used oil from food industry	1. Garbage. Mixture of different of garbage makes it hard to recycle. 2. Food-tainted items (such as: used paper plates or boxes, paper towels, or paper napkins) 3. Ceramics and kitchenware. 4. Windows and mirrors. 5. Plastic wrap. 6. Packing peanuts and bubble wrap. 7. Wax boxes. 8. Photographs 9. Medical waste 10. Polystyrene or Styrofoam 11. Hazardous chemicals and chemical containers 12. Plastic toys or sporting goods equipment 13. Foam egg cartons 14. Wood 15. Light bulbs 16. Yard waste or garden tools

Table 10.1.1: Lists of different types of waste

'Waste' is any unwanted material. These are objects that have been discarded, either because they do not function as intended or are simply not required anymore. Waste can come in many forms: solid, liquid or even gaseous (although it's mostly solid). There are many types of waste, but the two general ones are:

- Municipal Waste
- Hazardous Waste

Municipal Waste

It consists of everyday items discarded by the population. It includes clothes, wires, glass, unwanted food and a multitude of other things. It is further sub-divided into household, commercial and demolition waste.

- Household Waste – Materials like unused food, unwanted paper, empty batteries come under this category.
- Commercial Waste – Waste collected from establishments like businesses, trading factories, schools, etc., comes under this category.
- Demolition Waste – Evident from its name, this type of waste comes from the destruction of buildings or any structure made of concrete, bricks, wood, etc.

Hazardous Waste

It refers to solid, liquid or gaseous waste that has the properties of corrosiveness, ignitability, reactivity and toxicity. Proper disposal and treatment of this waste are necessary as it is unsafe for the well-being and the environment at large. It is further sub-divided into industrial and biomedical waste.

Fig. 10.1.1: Hazardous wastes

- Industrial Waste – Waste produced by industries such as chemicals, pigments, ashes, metals, etc., come under this category.
- Also cafeteria garbage, dirt and gravel, masonry and concrete, scrap metals, trash, oil, solvents.
- Biomedical Waste – Waste coming from medical facilities such as hospitals, medical colleges, research centres etc., come under this category.

  PPE kits also consider as biochemical waste (specially now a days)

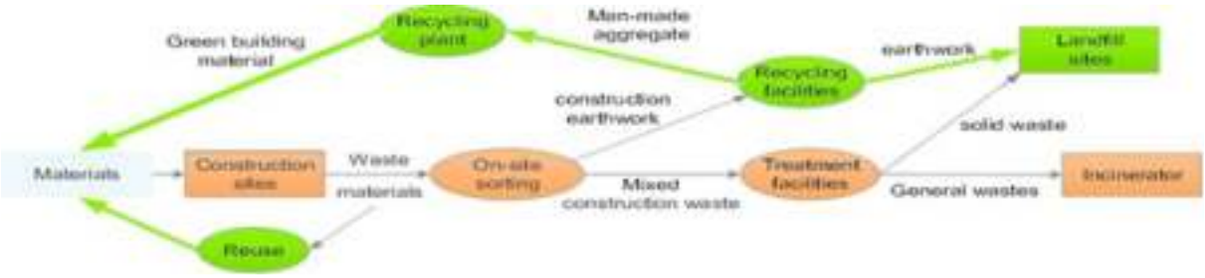

Fig. 10.1.2: Ways to process industrial and biomedical wastes

Significance of Different Coloured Dustbins

Colour coding of waste bin help us to understand which waste can be reuse or recycle and which waste need to dump. It also eliminates the amount waste through segregation process. Disposition process of waste can be defined based on different type of waste. Some waste can be dumped to land fill as it will not impact the soil quality such as food waste (onion, potato skin) as it act as fertilizer whereas industrial waste such as oil, batteries, chemical can't be dumped in land fill as it is hazardous to the soil property. It means if the wastes were separated in the 1st place then it will prevent or reduce any kind of negative impact to the environment due to waste disposition process.

Ideally every place where we discard waste should have three bins.

GREEN – for wet waste, which comes from the kitchen/cooking/food, goes to one bin.

BLUE – Dry recyclable waste such as newspapers, cardboard, packing plastics, bottles, cans, etc., should go to a different bin.

RED – Reject waste, which does not belong to the above two categories, including biowaste like diapers and bandages should go into a third bin.

All over the world, three-way segregation of waste is followed, and it is primarily instituted with some form of colour coding. It works just like the way traffic lights are coded in people's minds.

Govt authorised vendor details for different waste disposal solution-

There are many industries those are known for waste collection and disposal process approved by Indian govt. through registration process.

S No.	Registered PRO	Issued PRO Certificate
1	M/s. Attero Recycling Private Limited, H-59, Sector 63, Noida, UP-201301	11.10.2018
2	M/s. Auctus E Recycling Solutions Pvt. Ltd. A-58, Udyog Kendra-1, Ecotech-III, Village Habibpur, Noida-Dadri Road, Surajpur, Greater Noida (UP) 201306	12.11.2018
3	M/s Earth Sense Recycle Pvt. Ltd., Plot No:37, TSIIC Industrial Park, Mankhal, Maheshwaram Mandal, Rangareddy Dist., Telangana-501359	11.10.2018
4	M/s EPR Compliance Pvt. Ltd., 422, The Summit Business Bay, Andheri Kurla Road, Near WEH Metro Station, Andheri (East), Mumbai-93	12.11.2018
5	M/s Hulladek Recycling Pvt. Ltd., 4 D.L. Khan Road, Block B, Flat-401, 4th Floor, Kolkata-700025	12.11.2018
6	M/s Karo Sambhav Private Limited, 408-409, Fourth Floor, Suncity Business Tower, Sector-54, Golf Course Road, Gurugram-122002, Haryana	29.08.2018
7	M/s Mahalaxmi Metalloys India Private Limited, Plot No. 87, 91/92, Sikhera Road Industrial Area, Modinagar, Dist. Ghaziabad (U.P.)201204	23.10.2018
8	M/s Pegasus Support System Pvt. Ltd. F- 6, 1st Floor, 4648/1, 21, Ansari Road, Daryaganj, New Delhi 110002	14.09.2018
9	M/s Pro Connect, G-7, New Market, Near Khasa Kothi Circle, Jaipur-302016 Rajasthan	12.11.2018
10	M/s R2 PRO Pvt. Ltd., B03-Jain Height-Altura, Kalkondrahalli, Sarjapur Road, Banglore-560102	23.10.2018

Fig. 10.1.3 : Examples of waste collecting vendors

UNIT 10.2: Waste Management and Disposal Solutions

Unit Objectives

By the end of this unit, the participants will be able to:

1. Describe waste management and disposal solutions

10.2.1 Waste Management and Disposal Solutions

Waste management includes the activities as well as actions required to manage waste from its inception to its end disposal. This involves the disposal, collection, transport, and treatment of waste, together with regulation and monitoring of the waste management procedure and waste-related laws, technologies, as well as economic mechanisms.

Proper management of waste is significant for building sustainable and liveable cities, yet it remains a challenge for many developing countries and cities. A large portion of the practices of waste management deal with municipal solid waste, which stands to be the bulk of the waste that is produced by household, industrial, and commercial activity.

Fig. 10.2.1: Waste management and disposal solutions

Turn Away from Single-Use Plastics

A few instances of these include plastic straws, sanitary napkins, take-out containers etc. There are plenty of reusable alternatives to them, like glass and metal straws.

One good manner of doing this is by shopping at bulk stores and zero-waste stores that provide products without packaging. A good practice is to carry around a reusable bag, metal straw and a stainless steel bottle to cut the dependencies on polluting stuff.

Fig. 10.2.2: Waste Management Hierarchy

Conventional Technologies

It is apparent that certain technologies are no longer applicable to modern waste reduction as well as recycling, but some organizations continue to rely on them because they appear to be cheap. However, more technologies are evolving or being created to solve waste management problems. These technologies can be used to recycle or up cycle waste, creates alternatives from products that normally produce more waste, or find a way to address the ever-growing problem of waste management.

There is seen to be plenty of this technology, including plastic-free shampoo pods and toothpaste pills, machines that sustainably remove waste from bodies of water.

UNIT 10.3: Pollution and Remedies

Unit Objectives

By the end of this unit, the participants will be able to:

1. Explain pollution and its remedies

10.3.1 Pollution and Its Remedies

Today, the air is becoming foul, water is no longer clean, and forests are being cut down unscrupulously. Pollution in and of itself is difficult to define. The term is derived from the Latin word "polluere", which means 'to contaminate any feature of the environment. It may be broadly said to be 'adding to the environment a capably hazardous source or substance of energy faster than the environment can accommodate in it.

Methods to Counteract Pollution

Pollution prevention is considered as any action that reduces the number of contaminants released into the environment. Implementation of such processes reduces the severity and/or a number of hazards posed to both public health and the environment. If companies produce less waste, they do not have to worry about proper disposal. Some common methods for controlling pollution are:

- Reducing, Reusing, Recycling and Mitigating.
- Water pollution is capable of being controlled by using non-toxic soaps, detergents and cleaning products.
- Limiting the use of artificial fertilizers and pesticides helps in controlling soil and water pollution.
- Promoting and enforcing the use of biological methods for pest control.
- Chimneys should be longer in length so that polluting air is released high up in the atmosphere where it would not harm the surrounding environment.
- Automobiles should be installed with emission and pollution control systems.
- The timely servicing of automobiles also checks for air pollution.
- Carpooling and public transportation should be encouraged.
- Alternative sources of energy like wind, sun, water, geothermal should be harnessed and put to use.

Summary

- 'Waste' is any unwanted or un-useful material.
- Municipal wastes consist of everyday items discarded by the population.
- Hazardous waste refers to solid, liquid or gaseous waste that has the properties of corrosiveness, ignitability, reactivity and toxicity.
- Waste management includes the activities as well as actions required to manage waste from its in-ception to its end disposal.
- Proper management of waste is significant for building sustainable and liveable cities, yet it re-mains a challenge for many developing countries and cities.
- The biosphere and ecosystem are self-sustaining, and nature maintains a balance between the land, water, air and living organisms.
- The term "pollution" is derived from the Latin word "polluere", which means 'to contaminate any feature of the environment.
- Pollution prevention is considered as any action that reduces the number of contaminants re-leased into the environment.

Exercise

A. Answer the following questions briefly.

1. Which one stands to be a general type of waste?
   A. Commercial waste
   B. Hazardous waste
   C. Household waste
   D. Demolition waste

2. Which one is the type of hydrocarbon-eating bacteria that feed on oil?
   A. Alcanivorax borkumensis
   B. Bacillus
   C. Spirillum
   D. Vibrio

3. _____, reusing, recycling and mitigating helps in pollution reduction.
   A. Reducing
   B. Reinstalling
   C. Redeeming
   D. Reinvolving

4. The Latin term for pollution is _____
   A. pollueme
   B. polluese
   C. polluere
   D. polluete

5. _____ waste comes from medical facilities.
   A. Municipal
   B. Biomedical
   C. Industrial
   D. Commercial

B. Answer the following questions by choosing the correct option:

1. What are the differences between recyclable waste and non- recyclable waste?
2. What are two general types of wastes?
3. What stand to be the significance of the different colored dustbins?
4. Outline the responsible waste management hierarchy.
5. What are the methods for controlling pollution?

Notes

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11. Employability Skills

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Employability and Entrepreneurship Module

12. Annexure

Module No.	Unit No.	Topic Name	Page No	Link for QR Code (s)	QR code (s)
1. Introduction to the Diligence Program and Overview of the Food Processing Industry	UNIT 1.1 Size and scope of the food retail industry	1.1.1 Size and scope of the food retail industry	5	https://www.youtube.com/watch?v=J-2EiMVNtpM&t=11s	Overview of Food processing industry
2. Prepare for sale and promotion of food products	Unit 2.1 Introduction to Food Sales and Marketing	2.1.2.6 Processes	44	https://www.youtube.com/watch?v=xZv67O0kMcc&t=2s	Difference between sales and marketing
2. Prepare for sale and promotion of food products	Unit 2.1 Introduction to Food Sales and Marketing	2.1.3.4 Handling Customer Objections	44	https://www.youtube.com/watch?v=aApfcUqGzog	Handling Objections
2. Prepare for sale and promotion of food products	Unit 2.3 - Prepare for visual merchandising	2.3.1.1 Advantages of visual merchandising	44	https://www.youtube.com/watch?v=9-Ng8wPd9Z4	Important elements of visual merchandising
3. Perform various tasks for selling food products	Unit 3.2 - Manage Point-of-Sale (POS) systems	3.2.1 Concept of Point of Sale (POS)	74	https://www.youtube.com/watch?v=2KTk8WMRFpE	Point-of-Sale (POS) systems

3. Perform various tasks for selling food products	Unit 3.1 – Sell and promote food products to customers	3.1.3 Packaging Food Items	74	https://www.youtube.com/watch?v=Ta18d6JIO3o	Packaging and storage of food
3. Perform various tasks for selling food products	Unit 3.1 – Sell and promote food products to customers	3.1.3.1 Types of Food Packaging	74	https://www.youtube.com/watch?v=HcI3v1d22CM	Storage of finished products
3. Perform various tasks for selling food products	Unit 3.1 – Sell and promote food products to customers	3.1.3.2 Food Packaging Materials	74	https://www.youtube.com/watch?v=iTNRv0IZacI	Different type of packaging
4. Ensure upkeep of food products and related facilities	Unit 4.1 - Maintain Food Products in retail stores and Promotion Sites	4.1.2.1 Food Standards Regulations in India	97	https://www.youtube.com/watch?v=M44fARmrD6M	Future opportunities for a Food Sales Promoter
4. Ensure upkeep of food products and related facilities	Unit 4.1 - Maintain Food Products in retail stores and Promotion Sites	4.1.3.1 How to minimize damaged, spoiled and expired food product inventory	97	https://www.youtube.com/watch?v=HesWbNFSQS4	Documentation and record keeping
4. Ensure upkeep of food products and related facilities	Unit 4.2 – Carry out facility maintenance	4.2.2 Pests in food retail	97	https://www.youtube.com/watch?v=daNjRoP_I0c&t=87s	Health and safety practices at workplace

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