GOVERNMENT OF TAMIL NADU

HIGHER SECONDARY FIRST YEAR

VOCATIONAL EDUCATION

TEXTILES AND DRESS DESIGNING

THEORY & PRACTICAL

A publication under Free Textbook Programme of Government of Tamil Nadu

Department of School Education

Untouchability is Inhuman and a Crime

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PREFACE

The study on textiles, designing and fashion has taken a great leap in the last decade. People with a creative mind and students who are interested in gaining more knowledge in this field of arts, choose textiles and designing subject, to gain knowledge about the basics of textiles and dress designing to improve their skills and become good professionals in future.

This textbook is verbally crafted with this as a major objective. The knowledge sharing is done on two concepts. Concept one covers comprehensively on the complete background and basics of fiber, yarn and fabric. Concept two focuses on dress designing and garment construction. The basic tools for sewing machine, parts of sewing machines and procedure for designing, pattern making and sewing of dress are discussed in a very vivid manner. To enrich ones knowledge and skills this will enable the learner to become sewing operators in apparel industries, flat sketch designers in fashion industries or even start their own apparel units. This will help a budding designer to strengthen in the area of sewing and creating variations using various pattern making techniques.

We all know that textile industry plays an important role in being the backbone of the country. In the recent years, many textiles institute have been set up to meet the increasing demands and interest in this field of study. Therefore it has become quite necessary to publish a book in this subject which is easily intelligible to the readers.

Readers of the subject are sure to find the book extremely useful, convenient and interesting as well. Further, simple language is used for easy reading and understanding. Another important feature of the book is that all the patterns are illustrated with diagrams and examples. It is very much sure that students will find it valuable and understand in a better way.

Textiles and Dress Designing has been revamped by SCERT in collaboration with Tamil Nadu Skill Development Corporation in order to get immediate employment opportunities for the vocational students in the Industrial Sectors in future. The skill certificate for practical assessment is given to every student by concerned Sector Skill Councils (SSCs) which are accredited by National Skill Development Corporation (NSDC) and Tamil Nadu Skill Development Corporation(TNSDC).

0_XI_EM_TDD_FM_2022.indd 3 1/31/2023 3:49:32 PM

CONTENTS

THEORY

Chapters	Topic	Pages	Month
Preface		iii	
1.	Introduction to Clothing	01	June
2.	Textile Fibres	11	
3.	Fundamentals of Textiles	23	July
4.	Tools and Equipments for Clothing Construction	37	
5.	Introduction to Sewing Machine	46	
6.	Care and Maintainance of Sewing Machine	60	August
7.	Measuring System	67	
8.	Patterns	80	
9.	Sewing Terminology and Stitches	95	September
10.	Seams and Fullness	105	October
11.	Garment Components	115	
12.	Garment Decoration and Embellishment	129	November
13.	Health and Safety Measures in Apparel Industry	142	
14.	Industrial Engineering in Apparel Industry	152	
15.	Fashion Concepts	164	December
Model Question Paper – Theory		177	

0_XI_EM_TDD_FM_2022.indd 4 1/31/2023 3:49:32 PM

PRACTICALS

1. Demonstration of Sewing machine Operation 181

2. Preparation of sample for Basic and Decorative Stitches 185

3. Preparation of Samples for Seams and Seam Finishes 193

4. Preparation of Sample for Various Types of Fullness 197

5. Preparation of Sample for Types of Garment Components 202

6. Pattern Making - Preparation of Basic Pattern Set 211

7. Preparation of Sample for Types of Embellishments 223

8. Development of Flat Sketches for Garment Components 227

9. Garment Construction 230

Project **247**

Industrial Exposure **247**

Model Question Paper – Practical **248**

Reference Books **249**

CMLBO

E-book

H9JMN

Assessment

0_XI_EM_TDD_FM_2022.indd 5 1/31/2023 3:49:33 PM

TEXTILES AND DRESS DESIGNING

THEORY

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CHAPTER

1

INTRODUCTION TO CLOTHING

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LEARNING OBJECTIVES

- **To understand the origin of clothing.**
- **To gain knowledge about ancient clothing and the need for clothing.**
- **To learn the theories of clothing.**

1.1 INTRODUCTION

Clothing is a fundamental need of every human being. Leaves from plants and animal skin were used as clothing from pre-historic time for protection against animals and extreme climatic conditions. Today the clothing sector has a major shift from serving the functional needs to more aesthetic needs. A person's choice of clothing can have a plethora of effects on him/her on how you feel about a person based on dressing. For many people clothing makes them feel good about themselves and confident. Indian clothing industry is growing and is the second largest contributor in the retail industry. Clothing industry is vast and hence it provides job opportunities to many. This is a competitive world and clothing industry demands new creative designs, if you are a person with creativity and good designing skills then you can bring the change. Clothing industry is not limited in designing alone there are many job openings like visual merchandiser, product designer, market researcher, stylist, print manager, weaver and illustrator.

1.2 ORIGIN OF SEWING AND FABRIC

The beginning of sewing and fabric dates back to the Stone Age, where man used bones to sew animal skin and sharp twigs to interlace plant leaves, grasses and reeds to cover his body. When man learnt to live in one place (near the river beds) and to cultivate crops for food, he also slowly mastered the art of fabric making. The major fibres used were cotton, silk, linen and wool. During the 18th century man started spinning (twisting of fibre) and hand

XI_EM_TDD_CHAP01_2022.indd 1 1/31/2023 3:51:42 PM

weaving (interlacing of yarn) to produce fabrics. Only during the 20th century men started to manufacture artificial yarns are called as man-made yarns.

Primarily, clothing was a kind of drape in earlier years. Clothes were also decorated with colour, prints and embroideries. Today clothes are designed in computers. Digital clothes to monitor one's health are also available in the market.

1.3 PURPOSES / NEED FOR CLOTHING

Clothing is a basic need for human body. Clothing varies based upon sex, climatic conditions, standard of living, occupation, religion, nationality and personal liking. The major reasons for using clothing are discussed below:

Protection

Clothes protect human skin from climatic changes like rain, (Figure1.1), snow, wind, extreme cold and heat conditions. Clothes help to absorb sweat from the body, prevents one from sudden chillness and acts as a barrier between the human body and accidental burns, scratches and rough surfaces.

Example: Eskimos keep themselves warm by using fur clothes which traps warm air from the body and does not allow cold air from the external environment to touch the body.

Figure 1.1 Rain Coat

Safety

Some sports and occupation requires clothes which can provide safety from accidents. Examples: Protective pads (Figure 1.2), helmets (Figure 1.3) used in football and cricket, Asbestos clothing for fire fighters, Bullet proof vests for police and military men, Fluorescent orange vests for road workers.

Figure 1.2 Protective Pads

XI_EM_TDD_CHAP01_2022.indd 2 1/31/2023 3:51:42 PM

Figure 1.3 Helmet

Sanitation

Special clothes and accessories are worn regularly by people in specific occupations for sanitation purposes.

Examples: Doctors (Figure 1.4), Nurses, sanitary cleaners and people working in food production sectors wear uniforms, gloves, face masks, caps to prevent contamination by germs.

Figure 1.4 Sanitation

Modesty

Covering the body in a proper way is considered as modesty. This varies from people to people, nation to nation.

Example : A sleeveless, low neck top and highly decorated skirt may not be considered as a modest for an office wear (Figure 1.5).

Figure 1.5 Modesty

Identification

Most of the companies, schools, institutions and specific jobs (Doctors) have a particular dress code. This helps in identifying the person with the profession.

Example: Doctor's coat (Figure 1.6), worn above the normal dress helps one to identify the doctors.

Figure 1.6 Doctors Coat

Uniforms

One of the easiest ways to identify a group is through uniform. Uniforms are related to jobs like the police force, fire department and military. Athletic teams and sports person in

XI_EM_TDD_CHAP01_2022.indd 3 1/31/2023 3:51:42 PM

a team wear uniforms of particular colour. People working in the service occupations such as, restaurant, airline employees wear special uniforms **(Figure 1.7)**.

Figure 1.7 School Uniforms

Tradition

Tradition has been followed in all countries with reference to clothing. Due to traditional reasons specific colours and dresses are used in different occasion.

Example: White or black colour garment for marriages and funerals, black robes, cowl and mortarboard caps with tassels used by graduates (Figure 1.8).

Figure 1.8 Traditional Graduate Gown

Insignias

Patches, badges or emblems pinned or machined to jackets and dresses is a symbol of insignias.

Examples: National Service Scheme (N.S.S), National Cadet Corps (N.C.C) badges (Figure 1.9). Even in school and sports T-shirts, insignia is in the form of school first letter or company for whom the team is playing.

Figure 1.9 N.C.C. Insignias

Status

Clothing is a symbol of status also. It helps to identify the position of an individual. These clothings and accessories are more expensive with recent designs and styles.

Example: Clothing and accessories like the crown used by queens and kings (Figure 1.10).

Figure 1.10 Status

XI_EM_TDD_CHAP01_2022.indd 4 1/31/2023 3:51:43 PM

Decoration

Adornment or decoration is considered important by every individual. Clothing can enhance one's look through decoration of garments and use of accessories. Even the cave men decorated themselves with painting using colours from berries and tattooing their bodies with sharp pins or needles.

When was the first form of tattooed humans found?

Otzi the iceman was the oldest discovery of tattooed human This dates between 3370 and 3100 BC. Tattooed human figures are also found in at least 49 archaeological sites including locations in Greenland, Alaska, Siberia, Mongolia, Western China, Egypt, Sudan, the Philippines, and the Andes.

1.4 THEORIES OF CLOTHING

Clothing theories are developed based upon the use and growth of clothing. The four major theories of clothing are modesty, immodesty, adornment and protection theory.

Modesty Theory

The basic importance of clothing is to cover or conceal the private parts of the human body.

Example: Leaves used around the waist and bust, by Stone Age women as clothing.

Immodesty Theory

Historical records on clothing, mention about clothing used to attract opposite sex. According to this theory the basic idea of clothing is attraction seeking.

Example: Tight fitting pants and garments which expose body parts.

Adornment Theory

Right from the origin of mankind, people were trying to beautify themselves. Clothing has always supported this idea and helped one to form beautiful appearance. Wearing beautiful garments gives an aesthetic appearance.

Example: Decorated blouse with embroidery and stone work.

Protection Theory

Clothes have always been used for protection against extreme climatic conditions such as winter, rainy and summer seasons. Exposure to dangerous materials and environment such as furnace, boiler and thermal stations require special type of clothing.

Example: Woolen coats – winter season, rain coats – rainy season and boiler suits – for people working in a furnace.

1.5 CLASSIFICATION OF CLOTHING

Clothing is classified based on the following five aspects:

1. Based on method of wearing.
2. Based on the area of usage.
3. Based on gender.
4. Based on occasion.
5. Based on occupation.

Clothing based upon the Method of Wearing

Clothing can be grouped based upon the method it is worn. They are draped clothing, slip on clothing, open stitched clothing, closed clothing and sheath clothing.

XI_EM_TDD_CHAP01_2022.indd 5 1/31/2023 3:51:43 PM

Draped Clothing

Draped clothing is clothes which run into meters and are draped over the body or certain method of wearing.

Example: Indian saree draping Maharashtra – Saree is pleated and tucked between legs ; Gujarath – Saree pallu is draped, over the bust from right side shoulder ; Tamil Nadu – Saree is pleated in front and draped over left shoulder (Figure 1.11).

Figure 1.11 Draped Clothing

Slip on Clothing

Slip on clothing is single piece with an open, around the neckline which is pulled through the head and the garment falls from shoulder.

Example: Petticoats without openings.

Open Stitched Clothes

Open stitched clothes are clothes that are worn for decorative purposes over another dress. They are stitched with an opening in the front.

Example: Overcoat (Figure 1.12).

Figure 1.12 Open Stitched Cloth

Fitted Clothing

Fitted clothing is stitched to fit the body of an individual are also called as closed fitted clothing.

Example: Kurta.

Sheath Clothing

Sheath Clothing is the specialty clothes that are molded to a specific shape and made into a hard shaped garment.

Example: Bullet proof amours used in wars (Figure 1.13).

Figure 1.13 Sheath Clothing

XI_EM_TDD_CHAP01_2022.indd 6 1/31/2023 3:51:43 PM

Clothing based upon the area of Usage

Clothes can be grouped based on their usage on different parts of the body as clothing for head, neck, upper bodice, lower bodice (hip) and leg.

Head Clothing

Clothes worn around the head are called head clothing. They are usually used for protection, decoration or as a symbol of status.

Example : Woolen caps to protect in winter, turban used for decoration during Indian marriages.

Neck Clothing

Clothes used around the neck are known as neck clothing. These are also used for protection or decoration.

Examples: The mufflers around the neck in winter and scarfs used by teenagers for decoration.

Upper Bodice Clothing

Clothes used over the upper bodice or chest part of a human body are called as upper bodice clothing.

Example : Men's shirts, kameeze.

Lower Bodice (Hip) Clothing

Clothes used to cover the lower body of an individual are grouped under lower bodice clothing.

Example : Pants, pyjamas.

Leg Clothing

Clothes worn to cover leg are called leg clothing. They are mainly used for protection.

Example : Socks (Figure 1.14).

Figure 1.14 Leg Clothing

Classification of Clothing Based on Gender

Some clothes are designed specifically for women and men. But others can be used by both men and women.

Example : Saree blouse for women (Figure 1.15), vests used by men and kurtha or jeans pant used by both men and women (Unisex).

Figure 1.15 Saree Blouse for Women

Classification of Clothing Based on Occasion

Across the globe every human has his own culture and festivals. Each of them is well defined by use of specific clothing.

Example : The Kerala wedding costume where in the women use blouse and mundu, men use silk dhoti and towel over the shoulder (Figure 1.16).

XI_EM_TDD_CHAP01_2022.indd 7 1/31/2023 3:51:43 PM

Figure 1.16 Classification of Clothing Based on Occasion: Kerala Wedding Costume

Classification of Clothing Based on Occupation:

Clothes are always related to work and work place. Depending upon the work, clothes are designed, so that it can help the weavers to carry out their jobs easily.

Example: The coat and hat of a chef. The coat contains pockets to hold spoons and other accessories, whereas the hat prevents fall of hair into the cooking items **(Figure 1.17)**.

Figure 1.17 Classification of Clothing Based on Occupation : Coat and Hat of a Chef

1.6 TRENDS IN CLOTHING INDUSTRY

Clothing industries have expanded to meet the day-to-day changes in the global market. The most prominent trends in the industry are e-Commerce, Adoption of sustainable practices, Use of recycled polyester, Upcycling textile waste, Minimalistic Fashion (Slow Fashion), Second hand or rental clothing (thrift clothing), Growth of athleisure (Comfortable clothing for sports and leisure activities) ,Increase in use of unisex clothing, Buy Now Pay Later (BNPL) approach.

What is Tarkhan Dress?

Tarkhan Dress is the oldest woven dress made out of linen. It is found in the Egyptian tomb and dates back to more than 5000 years back. It is a long gown which falls below the knee level.

1.7 SUMMARY

Clothing is rightly known as the second skin of human. This lesson described the growth of clothing during the early ages and the major uses of clothing. Clothing is basically used for modesty, protection, immodesty and adornment. Clothing is further classified based on various criteria like place of usage, time, occupation and so on. Shortly the clothing adds beauty and protection to every one.

XI_EM_TDD_CHAP01_2022.indd 8 1/31/2023 3:51:43 PM

POINTS TO REMEMBER

- Twigs, barks and leaves are early clothing.
- Clothing is used to cover every part of the body.
- Clothing protects everyone from climatic changes.
- Clothing adds identification and status.
- Clothing has changed from basic fibres like cotton to digital clothing.

ACTIVITIES FOR THE TEACHER

- Download clothing used during various periods – Stone age, New stone age, Digital and show it to the students.

ACTIVITIES FOR STUDENTS :

- To collect pictures of different types of clothing based upon
  - Seasons and Occupation

GLOSSARY

1.	Eskimo	People living in North Canada, Alaska, Greenland and East Siberia.
2.	Asbestos	Type of Mineral fibre extracted from silica.
3.	Modesty	Being polite. /Dressed appropriately
4.	Identification	To denote specific group or class.
5.	Drape	To cover ; covering over.

INTERNET RESOURCES

https://www.youtube.com/watch?v=EyC1MXS9YDI&t=17s	Different Types of Clothes in India
https://www.youtube.com/watch?v=okYBOzz950A	Types of Clothes

XI_EM_TDD_CHAP01_2022.indd 9 1/31/2023 3:51:43 PM

QUESTIONS AND ANSWERS

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PART – I

I. Objective Questions:

1. When was artificial yarns manufactured

   (a) 19th Century (b) 20th Century (c) 18th Century (d) 17th Century

2. Which Garment is coming under closed fit category?

   (a) Kurta (b) Pleated Skirt (c) Gown (d) Petticoats

3. Boiler suits are used by

   (a) Military men (b) Football player (c) Cricket player (d) Furnace workers

4. _____ clothes run into meters and are draped over the body base according to individual preference.

   (a) Draped (b) Open sewed (c) Closed (d) Sheath

5. In Kerala, for wedding men wear _____

   (a) Silk dhoti and towel (b) Rayon dhoti and towel

   (c) Cotton dhoti and towel (d) Polyester dhoti and towel

PART – II

II. Answer in Three (or) Four Points:

1. What is safety in clothing ?
2. What are insignias?
3. Define protection theory.
4. List the types of clothing based on gender.
5. Write short note on clothing based on occupation.

PART – III

III. Answer in a Paragraph

1. How will you justify clothing as protection?
2. What are the different methods of wearing a fabric?
3. Describe clothing based upon the area of usage.

PART – IV

IV. Answer in one Page:

1. Describe the purpose of clothing.
2. What are the theories of clothing?

Answers for Objective Questions:

1. (b) 2. (a) 3. (d) 4. (a) 5. (a)

XI_EM_TDD_CHAP01_2022.indd 10 1/31/2023 3:51:43 PM

CHAPTER

2

TEXTILE FIBRES

LEARNING OBJECTIVES

- **To learn about the classification of textile fibre.**
- **To gain knowledge in the manufacturing process of cotton, silk, wool, viscose, polyester and nylon fibres.**
- **To know about the uses of fibres for various end applications.**

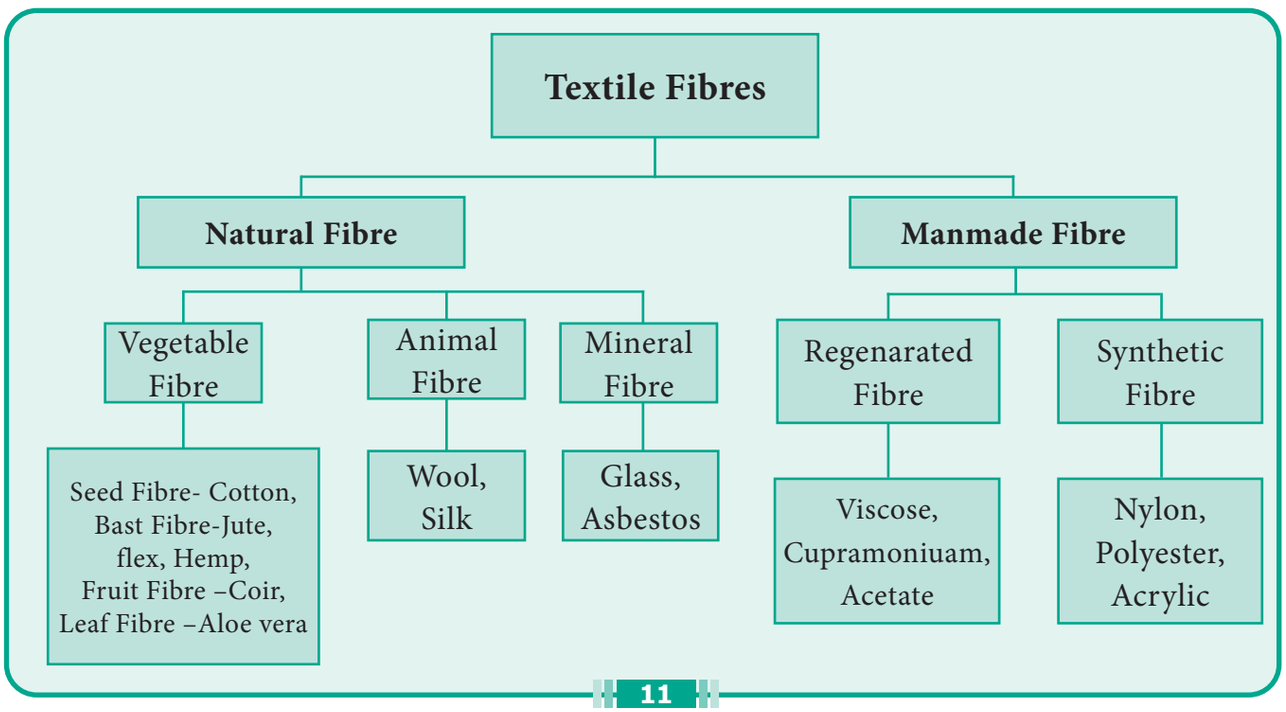
2.1 INTRODUCTION

In the textile industry, various types of fibres are used to make garments. Textile fibres are having various qualities and usages in garment making. Cotton, wool and silk are the most well known natural fibres. Polyester and nylon are the most commonly used manmade fibre to make various types of garments and technical textiles. There are several other commonly used natural fibres like jute, flax, linen and asbestos.

2.2 DEFINITION OF TEXTILE FIBRE

Textile fibre is a unit of matter, either natural or manmade, that forms the basic elements of fabrics and other textile structures. It has a uniform cross sectional view. The length of fibre is larger than the thickness of the fibre. The main quality of the fibre is flexibility.

2.3 CLASSIFICATION OF FIBRES



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2.4 A REVIEW OF TEXTILE FIBRES

Natural Fibres

Natural fibres are taken from the plant and animal sources. Since they are available naturally in the plant, animal or minerals, they are called as natural fibres. Cotton, silk and wool are the most well known natural fibres. There are several other commonly used natural fibres like jute, flax, linen and asbestos.

Cotton

Cotton is a natural seed fibre. Cotton is also known as the **"King of Fibres"**. Cotton fabrics are both soft and strong. Cotton is the most used fibre, irrespective of age, sex and nationality, (Figure 2.1)..

Figure 2.1 Cotton

Cotton Cultivation and Harvesting

- Soil: clay and red soil
- Rain needed: 8 to 10 cm
- Climate: warmth and moisture in air
- Cotton seed sowing period: continuous rainy season.
- Plant growth period: moderate rain and warmth temperature
- Duration of full growth:120 to180 days

Figure 2.2 Cotton Cultivation and Harvesting

- Flowering period: 60 to 90 days from sowing seed
- Cotton fruit growth:90 to 180 days
- Harvesting: when the fibers blast out from the fruits, (Figure 2.2).

Jute

Jute is extracted from the bark of the jute plant. Jute is also called as **"Golden Fibre"** it is golden in colour and high economical value. It is biodegradable and recyclable fibre. India is one of the leading manufacturing countries of jute fibres, (Figure 2.3).

Figure 2.3 Jute Fibre

XI_EM_TDD_CHAP02_2022.indd 12 24-01-2023 13:16:57

Jute Cultivation and Harvesting

- Sand : red and clay sand, alluvial soil
- Distance between the plant : 10 cm
- Rain needed : 12.5 to 25 cm
- Height of the plant: 2 to 5 meters like bamboo tree
- Temperature : 60°c to 100°c for growth period
- Flowering period : yellowish flower appear after full growth and is ready to harvest

Jute Fibre Extraction Process

Jute stems are soaked in water for separation of fibre. It is known as **Retting**. There are different types of retting, namely Dew retting, Tank retting, River retting and Chemical retting.

After retting the jute fibres are completely removed from stalks by hand or beating with wooden blocks. This is called as **Stripping.**

Silk

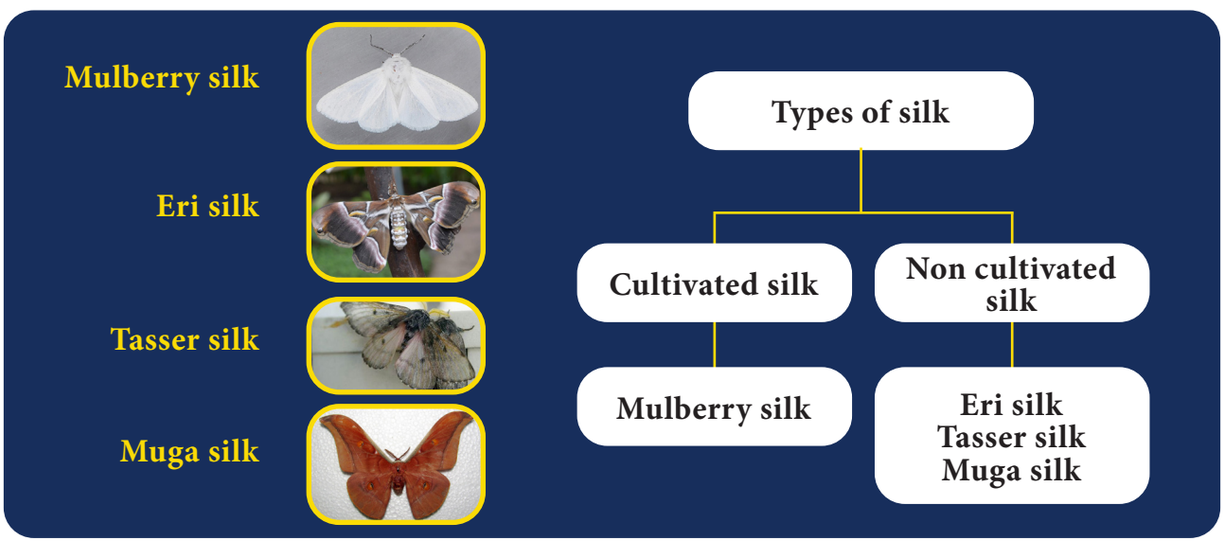
Silk is commonly known as the **"Queen of Fibres"**. It is a smooth, lustrous, natural protein fibre. In natural fibre category, silk is the long length filament fibre.

Sericulture: The cultivation process of silk worm for silk production is called as **Sericulture**.

Life Cycle of Silk

Figure 2.4 Life cycle of silk

- Eggs
- Larva
- Pupa
- Adult Moth



Types of silk

XI_EM_TDD_CHAP02_2022.indd 13 24-01-2023 13:16:57

Silk Preparation Process

Mulberry Plantation

Cultivate mulberry plants

Egg Hatching

Eggs are bought from scientific centre and placed in 18°c to 28°c. After 10 days larva comes out and are feed with mulberry leaves

Pupa Production

After full growth, worm stops eating and forms cocoon around its body in next three days

Silk Reeling and Twisting

Cocoons are dipped in hot water then filaments are taken. Three to ten filaments are combined and twisted to make a single filament.

Weighing of Silk

Silk yarns are treated with chemicals and metals to increase the weight of silk, which was lost in degumming process

Wool

Wool is the protein fibre obtained from sheep. The hair obtained from goat, camel and rabbits are also called wool. Wool garments are mostly suitable for cold climate. The quality of wool depends upon the type of animal, its health, food, and climatic condition, (Figure 2.5).

Figure 2.5 Wool

XI_EM_TDD_CHAP02_2022.indd 14 24-01-2023 13:16:58

Figure 2.6 Shearing of wool

Wool Manufacturing Process

- **Shearing of Wool** – Removable of fibres from animal, (Figure 2.6).
- **Sorting of Wool** – Sort the wool into small and long fibre depending upon the quality.
- **Scouring of Wool** – The sheared hair is washed properly to remove dirt, dust and oil.
- **Carbonizing and Drying** – Carbonizing means to remove cellulosic material in the wool fibre. Then the fibres are passed through the rollers to squeeze out water as much as possible for drying.
- **Spun yarn** – Wool fibres are spun to make yarn.

Types of Wool based on Spinning

- **Woollen**– Woollen yarn is thick and are usually made from the shorter and long fibre of the sheep
- **Worsted** – Worsted yarn is made from the long staple fibre of the sheep

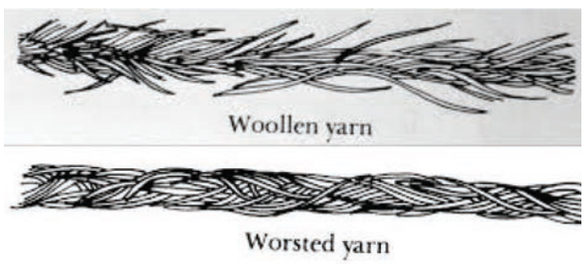


Figure 2.7 Wool based on Spinning

Man Made Fibres

Man made fibres are made by man with a combination of natural products along with chemicals or with chemicals alone. The former is known as **Regenerated Fibres** and later as **Synthetic Fibres**.

Regenerated Fibre- Man made natural fibres produced from natural cellulose extract mixed with chemical is known as Regenerated Fibre. Example viscose, acetate, cuprammonium rayon

Viscose is a regenerated or reproduced fibre obtained from wood pulp, (Figure 2.8).

Figure 2.8 Viscose

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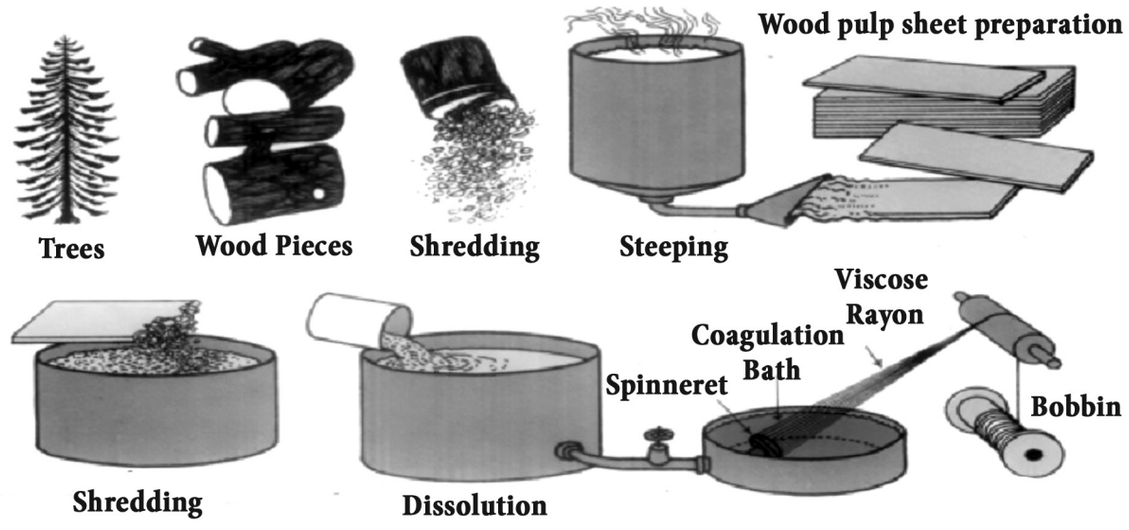

Figure 2.9 Manufacturing Process of Viscose

Manufacturing Process of Viscose (Figure 2.9)		
Step 1	**Wood pulp sheet preparation**	Separating cellulose from woody plant and made into sheets
Step 2	**Steeping**	Wood pulp sheets are soaked in 47.5% NaOH to prepare alkali cellulose
Step 3	**Shredding**	Wood pulp sheets are cut into small pieces
Step 4	**Ageing**	Small pieces of alkali cellulose are kept for three to four days at 22ºC to disjoint the wood molecule
Step 5	**Xanthation**	Add Carbon disulphide solution to change the solution into Cellulose xanthate by slowly rotating hexagon type chamber for 3 hours.
Step 6	**Dissolution**	Add 3% diluted Sodium hydroxide solution to make viscose solution
Step 7	**Ripening**	Remove the air from the chamber then regulate the viscosity of the solution
Step 8	**Viscose Rayon spinning**	Solution is passed through the spinneret and then into coagulation bath to make viscose rayon. Coagulation bath consists of 10%Sulpuric acid, 18% Sodium sulphate, 1% Zinc sulphate, 2% Glucose and 69% Water 69%

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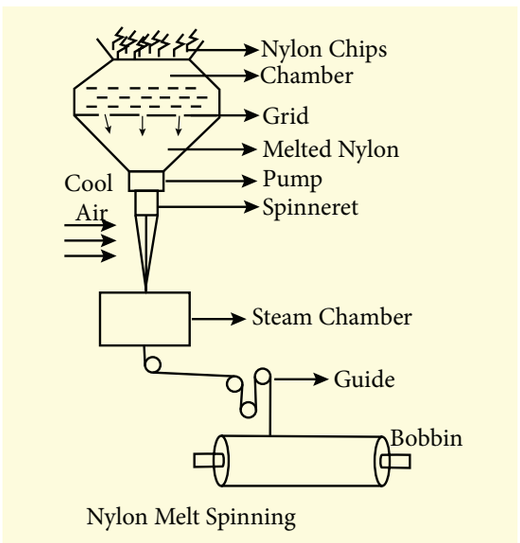
Nylon (Synthetic Fibre)

Figure 2.10 Nylon

Nylon belongs to polyamide group .The word Nylon is derived from **NY** letters from **NEWYORK** and **LON** letters from **LONDON**. Types of nylon filament are Nylon 6 and Nylon 66.

Nylon 6: 1 monomer – Caprolactum (consists 6 carbon)

Nylon 66: 2 monomer – Adipic acid (consists 6 carbon) and Hexamethylene diamine (consists 6 carbon)



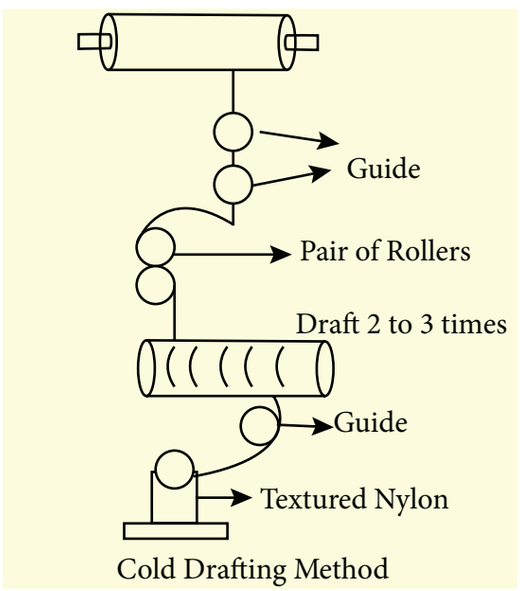


Figure 2.11 Nylon66 Yarn preparation

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Polyester (Synthetic Fibre)

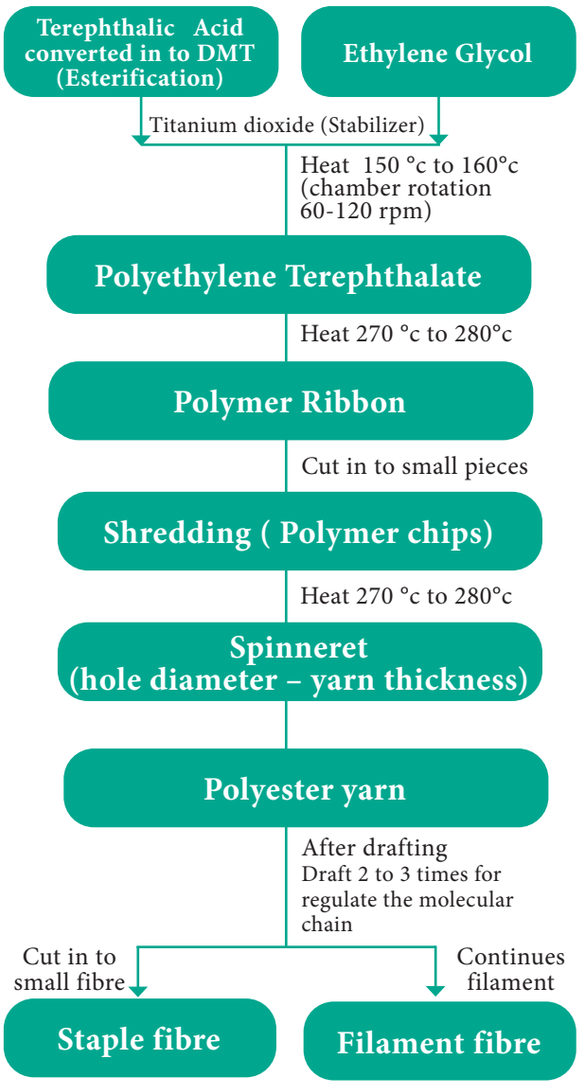
Polyester is a category of polymers that contain the ester functional group in every repeat unit of their main chain. It is commonly refered to polyethylene terephthalate . Raw materials needed for polyester preparation are Terephthalic acid and Ethylene glycol, (Figure 2.13).

Different stages of Polyester

- DMT (Di Methyl Terepthalate is prepared by Esterification process)
- Polymer production
- Polymer spinning
- Yarn production

Figure 2.12 Polyester

Polyster Yarn preparation



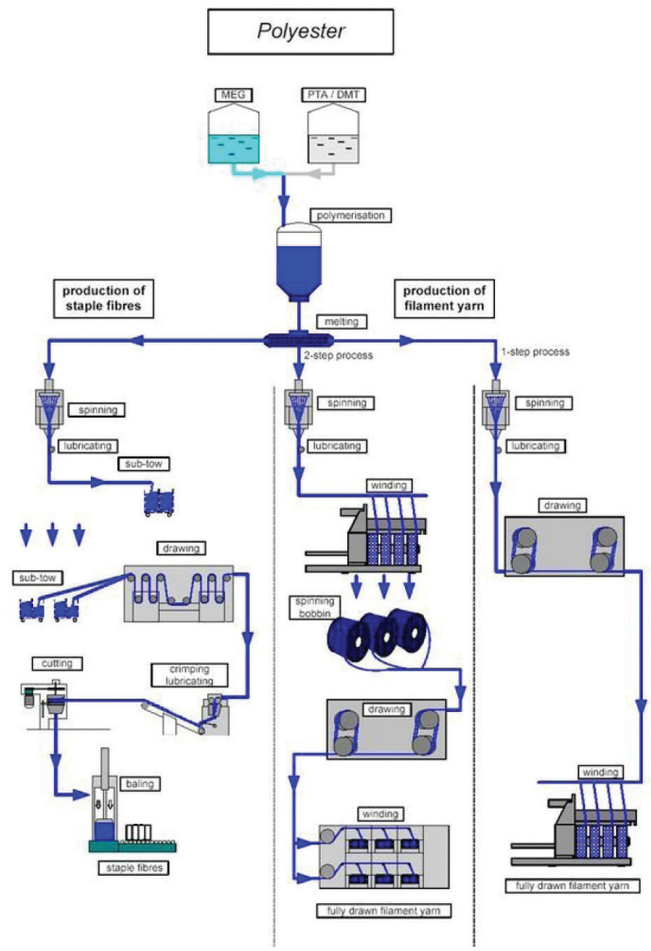


Figure 2.13 Polyester Yarn Preparation

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2.5 Uses of Textile Fibres in Apparel Industry

Fibre	Usage
Cotton	Clothing (Frocks, Socks, Towels, Sarees ,Dress Materials) Household Textiles (Bed Spread, Pillows) Medical Textiles (Absorbant Pads ,Bandages)
Jute	Packing materials ,Curtain materials, Coat materials
Wool	Clothing (Winter Clothes – Muffler, Sweaters, Caps) Household Textiles (Blankets, Rugs, Carpets) Industrial Textiles (insulation material used to keep the object warm)
Silk	Clothing (Scarf's, Silk Saree, Dhoti, Towel, Dress Materials) Household Textiles (Bed Spread, Wall Hangers, Table Cloths) Medical Textiles (Suture Threads)
Viscose (Rayon)	Clothing household textiles, Medical and Industrial textiles
Nylon	Women's stockings or hosiery Socks, Swimwear, Shorts, Track Pants, Active Wear, Draperies and Bedspreads Industrial Textiles, Fishing Nets, Ropes , Parachute's, Tyre Cords
Polyester	Clothing, Sarees, Blouse, materials , Jackets and other Dress Materials

2.6 SUMMARY

Natural fibres play a very important role in the development of textiles and clothing. These fibers are obtained from natural sources like plants, animals and minerals. Due to their properties they are safe to use. They are used for manufacturing a wide range of products used in our day to day life like clothing and home textiles. They also help in the production of medical and industrial textiles. Man-made fibres are a combination of natural products and chemicals. All synthetic fibres are filaments. Manmade fibres can be mixed with natural fibres to produce blended yarns. All man-made fibres and synthetic fibres are used for clothing and household articles.

POINTS TO REMEMBER

- Natural fibers are obtained from natural sources.
- Cotton, wool and silk are the commonly used natural fibers.
- Cotton is obtained from seeds and is a plant fibre. It is preferred by most of the people across the globe.
- Wool and silk are animal fibres which are obtained from sheep and silkworms respectively.
- Silk is used as festival fabric in India.

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- All man-made and synthetic fibres are filaments. They are manufactured by preparing a suitable solution and passing through the spinneret.
- Rayon is made by mixing natural cellulose substance and chemicals.
- Rayon is thin long filament, which is smooth with excellent dimensional stability.
- Nylon is a long chain of polymers made from haxamethylene diamine and adipic acid.
- Nylon has good strength, elongation elasticity and dimensional stability.

ACTIVITIES FOR THE TEACHER

- To display the natural fibres and explain.
- To explain the manufacturing process of the natural fibres through power point.
- To arrange for field visit to spinning mill and silk reeling unit.

ACTIVITIES FOR STUDENTS

- Collect the fabrics made with natural fibres and prepare an album
- Collect pictures and samples of manmade fibres

GLOSSARY

1.	Seed Fibre	Fibres collected from various plant seeds
2.	Leaf Fibre	Fibres collected from leaves
3.	Bark Fibre	Fibres collected from outer bark / Stems of plant.
4.	Fruit Fibre	Fibres collected from the fruits.
5.	Cotton	Soft and smooth cloth.
6.	Animal Fibre	Fibres taken from the animals / Insects.
7.	Silk	Fibres from silk worm, Queen of fabric.
8.	Wool Fibre	Fibres from animals. The oldest fibres used for protection from cold climate.
9.	Cellulose Fibre	Plant fibres produced from wood pulp
10.	Spinneret	A cap or plate with a number of small holes through which a fibre forming solution is forced.

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QUESTIONS AND ANSWERS

PART – I

Objective Questions:

1. Cotton is obtained from which part of the plant?

   (a) Seed (b) Leaf

   (c) Fruit (d) Bark

2. Pick out the natural fibre.

   (a) Rayon (b) Nylon

   (c) Polyster (d) Cotton

3. This fibre is strong and lustrous.

   (a) Cotton (b) Silk

   (c) Linen (d) Wool

4. Fibre obtained from animal.

   (a) Nylon (b) Cotton

   (c) Linen (d) Wool

5. Which monomer is used in Nylon 6 process?

   (a) Caprolactum

   (b) Adipic acid

   (c) Hexamethylene

   (d) Polyethelene

6. Which of following fibre is known as golden fibre?

   (a) Cotton

   (b) Silk

   (c) Linen

   (d) Jute

7. Cellulose is obtained from the cell walls of

   (a) Woody plants

   (b) Plastic

   (c) Metals

   (d) Mineral

8. This is also known as polyamide.

   (a) Rayon

   (b) Acetate

   (c) Nylon

   (d) HWM Rayon

9. Identify the Regenerated fibre.

   a) Viscose (b) Nylon

   (c) Silk (d) Wool

10. In alkali cellulose, what % of sodium hydroxide is used?

    a) 5% (b) 47.5%

    (c) 20% (d) 7.5%

PART – II

Answer in Three (or) Four Points:

1. Mention the favourable season for cultivating cotton.
2. Brief on the method followed for the production of silk.
3. State the process of silk weighing.
4. Explain the manufacturing process of wool.
5. What is the wollen and worsted type of wool?
6. Describe Retting and Stripping.

XI_EM_TDD_CHAP02_2022.indd 21 24-01-2023 13:16:58

7. Define polyester filament. List the stages involved in polyester preparation.
8. What are the raw materials used for manufacturing nylon?
9. Define textile fibre.
10. Write short notes about silk and its types.

PART – III

Answer in a Paragraph

1. Classify textile fibres.
2. Brief on nylon fibre and its preparation process.
3. Describe about polyester fibre and its preparation process.
4. Write down the uses of any 5 fibres in apparel industry.
5. Explain the process of sericulture.

PART – IV

Answer in one Page:

1. Explain viscose fibre and its manufacturing process.

Answers for Objective Questions

1. (a), 2. (d), 3.(b), 4. (d), 5. (a),
6. (d), 7. (a), 8. (c), 9. (a), 10. (b)

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CHAPTER

3

FUNDAMENTALS OF TEXTILES

LEARNING OBJECTIVES

- To understand yarns, yarn formation techniques and numbering system
- To gain knowledge about weaves and its properties
- To learn about knitting types and loop formation

JBSHR

3.1 INTRODUCTION

Yarn is formed by twisting of fibres together. Both the natural and synthetic fibres are used for making yarns. Yarn is also made from long filaments. It is described as a continuous strand of twisted fibers or filaments suitable for the fabrication of woven and knitted textile fabrics.

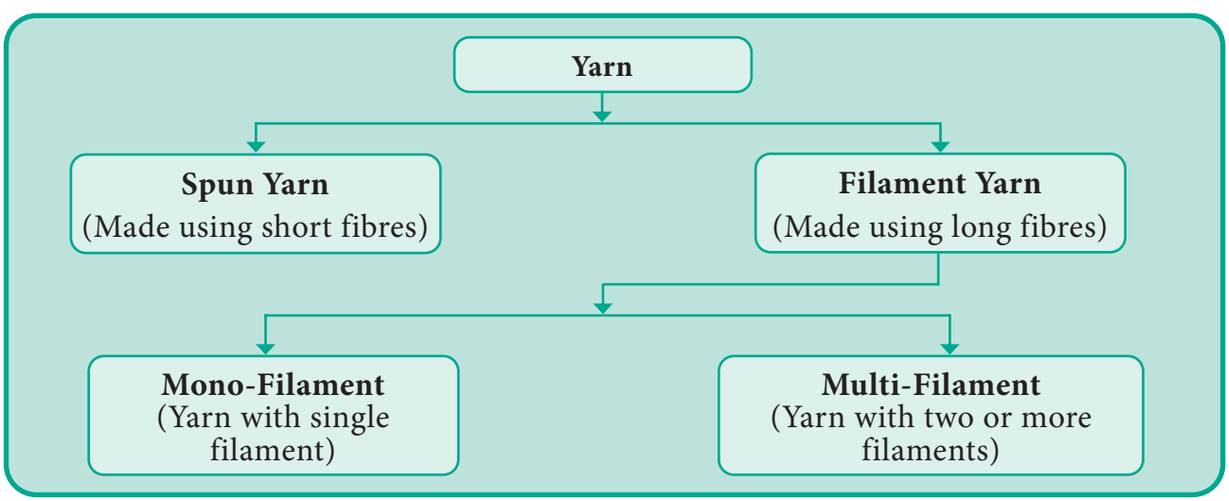
3.2 YARN FORMATION

Yarn occurs in the following forms:

- Twisting of fibres together
- Fibres are arranged together without twist
- Filament fibres are joined together with more or less twist

3.3 TYPES OF YARN

Yarn can be made by using short and long fibres. It can be classified into two types namely Spun Yarn and Filament Yarn.



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Who are the contributors for the development of Spinning Mule?

James Hargreaves was a weaver, carpenter from Lancashire, England. He was one of three inventors responsible for mechanizing spinning. Hargreaves was the one, who improved it with **spinning jenny** in 1764. Later in 1769, Richard Arkwright patented the water frame and finally Samuel Crompton combined both the creations to develop the Spinning Mule.

3.4 YARN TWIST

Fibres are arranged around an axis by means of twists. Twisting adds strength to the yarns. Number of twists determines the appearance and strength of the yarn.

Yarn twisting can be done in two directions. They are:

- S twist or clockwise or right hand twist.
- Z twist or anticlockwise or left hand twist, (Figure 3.1).

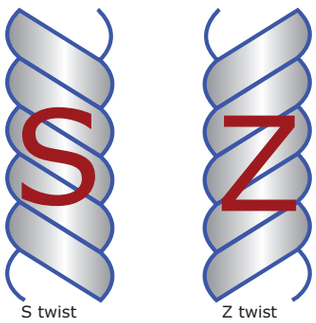
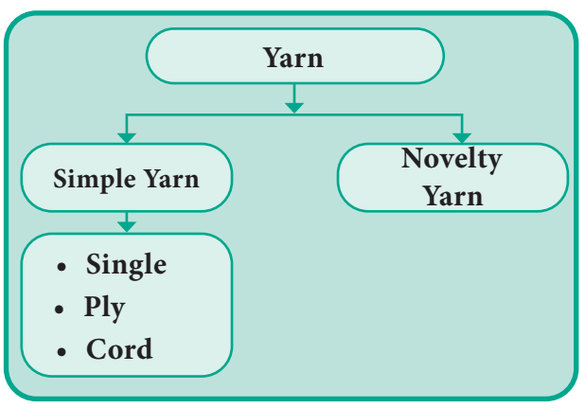


Figure 3.1 Types of Twist

3.5 CLASSIFICATION OF YARN



Single, Ply and Corded Yarn

Single Yarn

Single yarns are directly twisted from fibres.

Ply Yarn

Two or more single yarns are twisted together to form a ply yarn.

Cord Yarn

Two or more ply yarns are twisted together to form a cord yarn, (Figure 3.2).

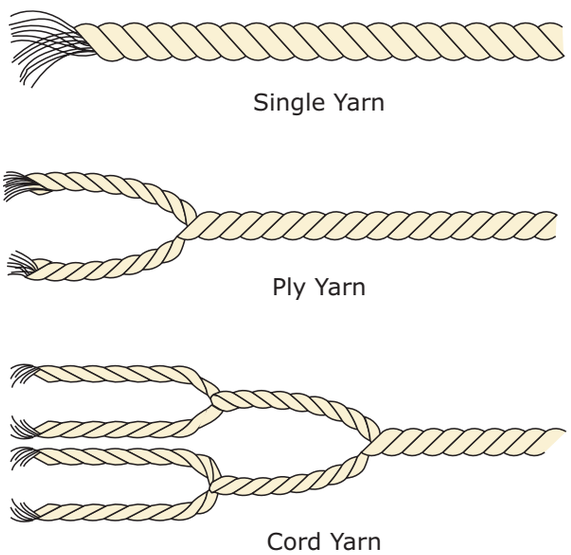


Figure 3.2 Yarn Classification

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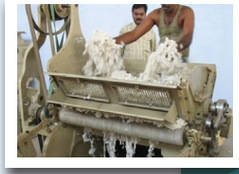
3.6 YARN MANUFACTURING PROCESS



GINNING
- To remove raw cotton (Kappas) seeds
- To make bales of the raw cotton and send it to the spinning mills

Cotton Bale

BLOW ROOM
- Removing seeds, dust and impurities from cotton, mixing and cleaning of cotton
- Lap (or) Chute Feeding

Lap (or) Chute

CARDING
- Separating individual fibre
- Cleaning the fibre
- Forming card sliver

Card Sliver

DRAW FRAME
- Insert six or more card sliver
- Draft card sliver to make the fibre parallel to one other

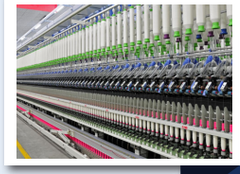
Draw Sliver

COMBING
- Removing short fibre
- Formation of combed sliver

Combed Sliver

SIMPLEX (ROVE FRAME)
- Drafting the sliver or combed sliver
- Twisting with the help of flyer
- Rove bobbin winding

Rove



RING FRAME
- **Drafting the rove**
- **Twisting with the help of traveller**
- **Wind the yarn in ring cop**

Yarn

WINDING
- Rewinding the yarn into suitable package (cone, hank)

Hank

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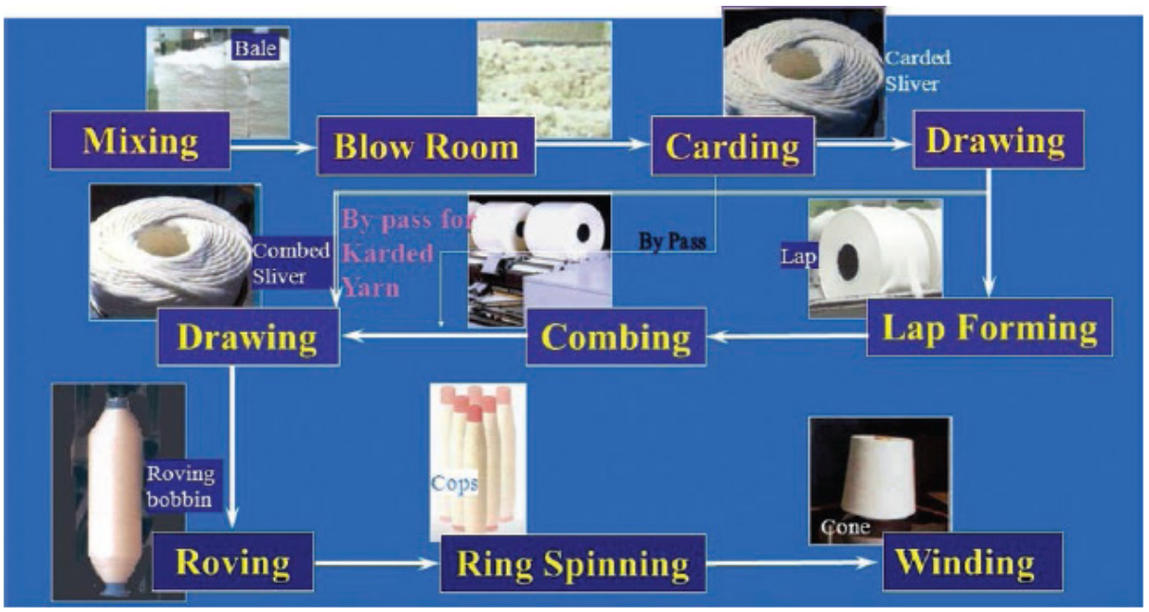
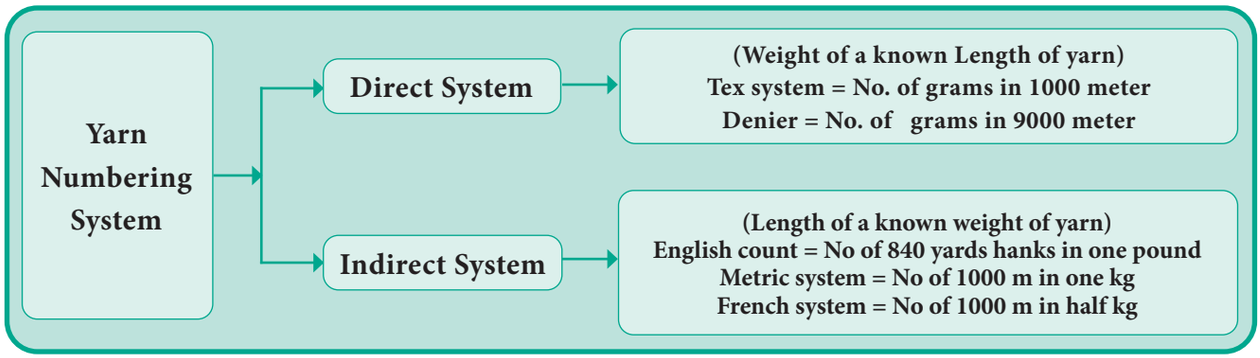


Figure 3.3 Yarn Manufacturing Process

3.7 YARN NUMBERING SYSTEM



3.8 WOVEN FABRICS

Classification of Fabrics

Fabrics are classified into three main types namely woven, knitted and non-woven fabrics.

Figure 3.4 Classification of Fabrics

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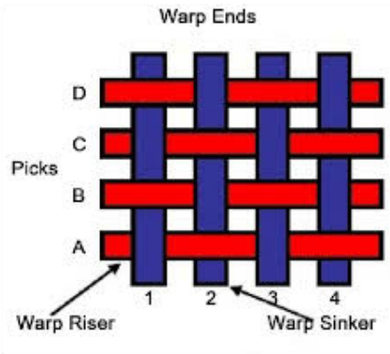

Figure 3.5
Warp and Weft Yarns

Figure 3.6
Selvedge

Figure 3.7
Loom

Introduction to Weaving

The processing of making a fabric on the loom is known as weaving.

Woven Fabrics: Woven fabric is any textile formed by the weaving technique. Fabric is formed by interlacement of warp and weft yarns in the weaving process.

Warp and Weft yarn: The warp yarns are those yarns which lie in the lengthwise direction of the woven fabric and the crosswise yarns are called weft yarns, (Figure 3.5).

Selvedge: The lengthwise finished edge of fabric is called selvedge**,** (Figure 3.6)**.**

Loom: The machine used for production of woven fabric is known as the loom (Figure 3.7).

Preparatory Processes of Weaving

Sizing -The yarns are unwound and dipped into sizing bath which consists of starch. Sizing process improves strength of the warp yarn to withstand the stress during weaving, (Figure 3.8).

Warping and Beaming – Warping is the process of winding the sized yarns on the warp beam which will be placed over the loom, (Figure 3.9).

Pirn Winding (or) Weft Winding – Pirn winding is the process of winding weft yarn on pirn. Prin is a small rod inserted into the bobbin of the shuttle to carry the weft yarns in ordinary shuttle loom. In shuttle less looms, weft yarn inserted directly from the cone or cheese, (Figure 3.10).

Figure 3.8 Sizing

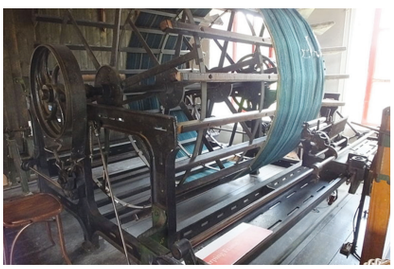

Figure 3.9 Warping

Figure 3.10 Pirn Winding

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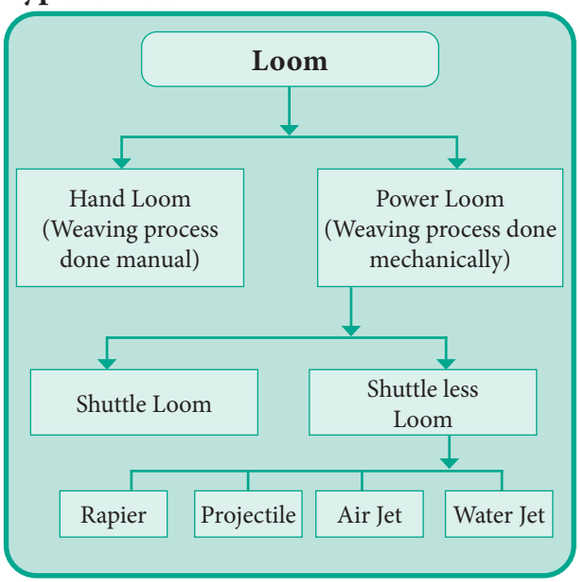
Parts of a Loom and their Functions

Parts	Functions
Heddle Wire	Divides warp yarn into two layers
Reed	Beat up the weft yarn into the correct position of the cloth
Shuttle	It holds the pirn with the weft yarns which insert the weft yarn into shed
Warp Beam	A roller onto which the warp yarns are wound
Picker	Picks the shuttle one box to another box across the warp yarn
Cloth Beam	Woven cloth is wound on roller after weaving

Types of loom



Weaving Process

The processes of weaving are carried out based on the movement or motion of the loom. The motions of loom are divided into 3 types;

- Primary Motion
- Secondary Motion
- Auxiliary Motion

Primary Motion

Shedding - Divide warp yarns into two layer (SHED)

Picking - Insert the shuttle through the shed

Beat up - Beat the weft yarn into fell of the cloth

Secondary Motion

Warp Let Off - Unwind the warp yarns from warp beam

Cloth Take up - Wind the woven cloth into cloth roller

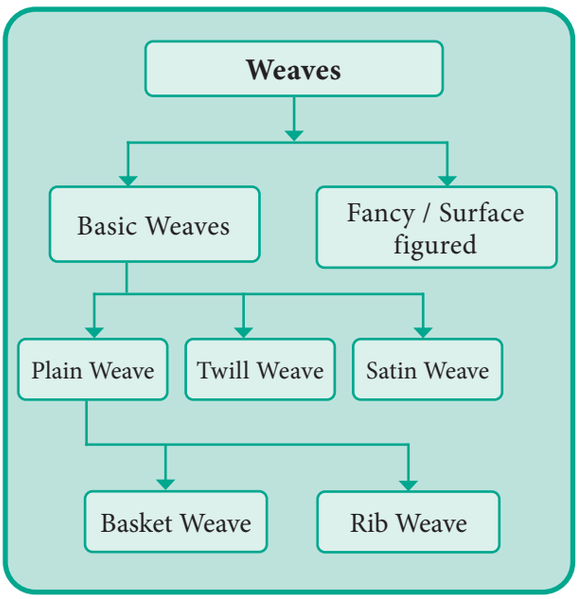
Auxiliary Motion

Warp stop motion – Stops the loom when the warp yarns are loose or cut

Weft stop motion – Stops the loom when the weft yarns are loose or cut

Warp Protection motion - Used for Protection of warp yarns while weft yarn insertion.

Classification of Weaves



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WEAVES AND THEIR PROPERTIES

Type	Structure	Properties	Example
Plain Weave	• Warp and weft interlaced alternatively	• Flat, look identical on both sides. • Yarn count even • Balanced fabrics • Inexpensive	• Cheese cloth. • Voile
Basket Weave	• Two or more warp interlaced with one or more weft • Variation of plain	• Flat • Variation of plain • Create checker board effect • Identical on both sides. • Use of coloured yarns for variation	• 2 x 2 blouse material.
Rib Weave	• Use of cords or different type of thicker yarn in warp or weft • Cord in warp is known as warp rib • Cord in weft is known as weft rib	• Heavy • Drapes well • Creates texture and design	• Poplin • Taffeta
Twill Weave	• Need three or more than three heddles • Warp or weft interlaced with two or more counter part yarns in progressive manner • If from right to left, known as right hand twill • If from left to right, known as left hand twill	• Heavy • Strong firm texture	• Denim Drill
Satin	• Need four or more heddles. • Warp interlaced after four or more yarns, forming floats	• Smooth • Lustrous • Excellent drape • Floats on the wrong side • Slippery	• Satin
Sateen	• Need four or more heddles. • Weft interlaced after four or more yarns forming floats	• Smooth • Lustrous • Excellent drape • Floats on the wrong side • Slippery	• Sateen

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Type	Structure	Properties	Example
Pile	• Extra set of warp or weft interlaced over ground yarns of plain or twill to form loops	• Soft • Good absorbent • Provides warmthness	• Terry Towels
Swivel	• Extra weft interlaced to form small design on the surface	• Decorative design • Yarn may be pulled out at the back • Multi coloured fabric	• Dotted Swiss Cloth
Lappet	• Extra warp / weft interlaced to form small design	• Decorative design • Only one colour used for decoration • Durable	• Grenadine
Double Cloth	• Extra set of warp / weft yarn to interlace two woven fabrics together	• Two reversible fabric • Can be two different fabric/ varying in colour and design • Strong and heavy • Thick	• Blanket Cloth
Leno	• Two warps twisted together with a weft yarn to create open mesh.	• Durable • Variation created by use of corded yarns	• Marquisette
Dobby	• Small geometrical designs, created by special loom attachment known as Dobby attachment.	• Decorative design • Corded effect • Good appearance • Simple and attractive	• Huckaback • Pique
Jacquard	• Interlacing of warp at various weft yarn at different points to create designs using control mechanism	• Intricate designs • Multi coloured effect • Drape well • Durability	• Brocade • Tapestry.

Application of Woven Fabrics

- A woven fabric is used for clothing and home textiles.
- It is used for both functional and decorative purposes.
- Woven fabrics also used as sportswear, medical, agriculture and packaging applications, textiles for electronics and in automotive engineering.

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Types of Woven Fabrics

3.9 KNITTING

Knitting is the process of making loop and throwing the yarns through the loops to form a fabric. Knitted fabric is formed by interlooping of yarns, (Figure 3.11).

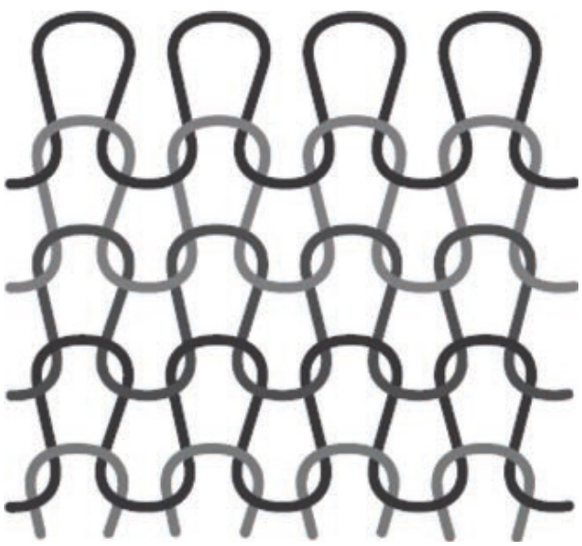
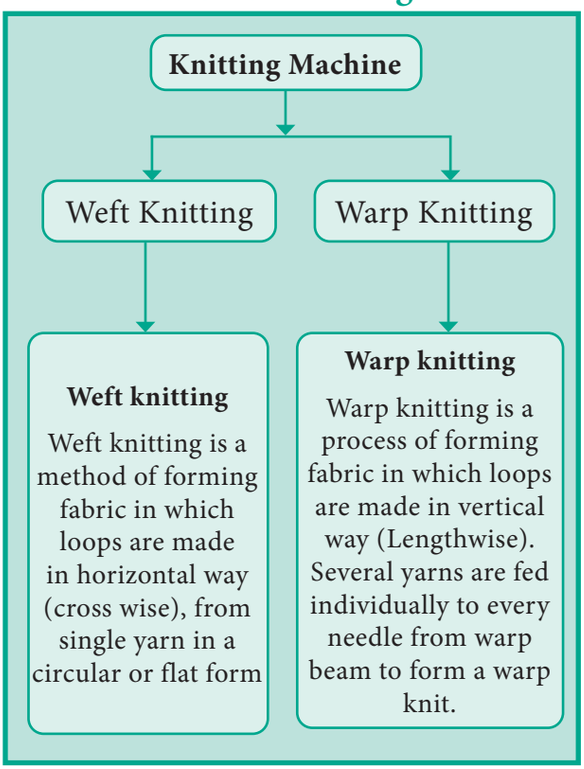


Figure 3.11 Knit Structure

Classification of Knitting Machine



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Parts of a Knitting Machine and their Functions

PARTS	FUNCTIONS
Needles	Knit formation (primary element of knitting m/c)
Sinker	Loop formation, holding down, knocking over
Cam	Responsible for upward and downward needle movement
Cylinder	Each needle can be placed in a groove cut into outer side of the cylinder

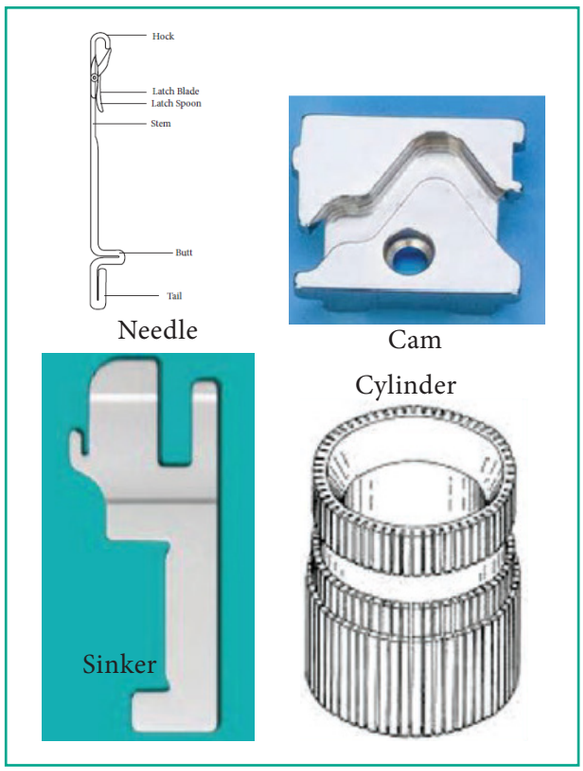

Figure 3.12 Parts of Knitting Machine

Technical Terms in Knitting

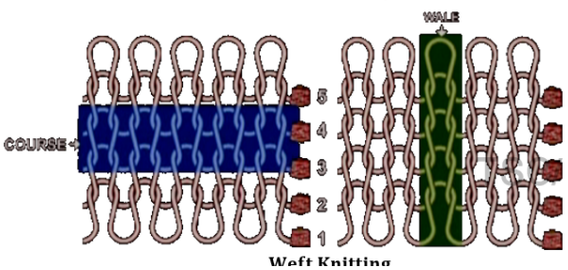

Figure 3.13 Courses and Wales

Course - Horizontal loop line in knitted fabric

Wale - Vertical loop line in knitted fabric

Gauge - Number of needles present in one inch

Knitting Process

The processes of knitting are carried out based on the movement or position of the needle, which forms the loops. The most common Latch needle movement is given as an example, (Figure 3.14).

- **Rest Position:** The needle is in rest position, when the old loop is placed in hook part of the needle.
- **Latch Opening Position:** The needle raises in the upward position and the old loop opens the latch and move towards the stem of the needle.

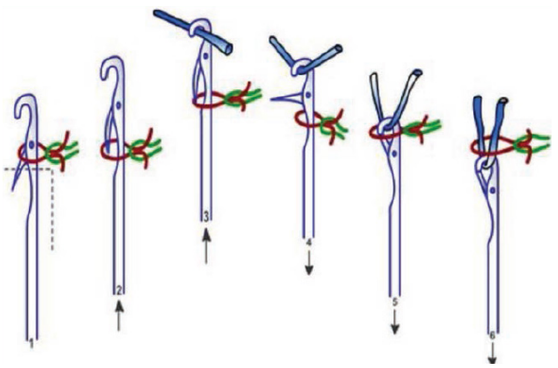

Figure 3.14 Position of Latch Needle

- **Clearing Position:** Now the needle raises to the highest position and the old loop move to the stem of the needle then the new loop is ready to move towards the hook.
- **Feeding Position:** The needle moves downwards and the new loop gets fully inserted into the hook. The old loop try to move upward.
- **Knocking Over Position:** When the needle moves in the downward

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Figure 3.15 Application of Non-Woven Fabrics

position, the old loop move upward and the latch part closes the hook.

- **Knitting Position:** Now the needle moves to endpoint of downward position. The old loop moves away from needle and make one knit with new loop

Application of Knitted Fabrics

- Knitted fabrics are used for clothing (Underwear, Outer wear, Socks and Sweaters)
- Home furnishing (Curtains, Towels), Medical textiles (Grip Bandages)
- Industrial textiles (Wipes, Absorbent Pads)

3.10 NON WOVEN FABRICS

The fabrics which are produced directly from bonding or entangling the fibres or filaments are called Non-woven fabrics. The bonding is done by mechanical, thermal or chemical. The Non-woven fabrics are classified Durable, Non-durable or disposable and Semi durable.

Application of Non Woven Fabrics

- Felts are used in home furnishing. Bonded fabrics are used in sanitary pads and diapers
- Durable non-woven is used for cap, interlining and interfacing for home furnishing, upholstery, carpets and filters
- Disposable non-woven are fabric which can be used only once like diapers and sanitary napkins and bandages.

3.11 SUMMARY

Yarns are necessary for fabric construction. They can be woven, knitted or non-woven fabrics. Spinning is the process in which fibres are twisted into yarns. Yarns determine the texture, appearance and performance of fabric. Different types of yarn are manufactured and used for various end applications. Weaving produces strong fabrics through interlacing of yarns whereas knitting produces flexible

XI_EM_TDD_CHAP03_2022.indd 33 24-01-2023 13:19:03

fabrics through interlooping of yarns. Fibres which are very short with poor spinnability can be used for making Non-woven fabrics. A wide range of fabrics with various applications in day to day life can be made by these three methods of fabric production.

POINTS TO REMEMBER

- Yarns are strands of fibers or filament twisted together
- Yarns are made from natural or man-made or blended fibres
- Opening and picking, carding, combing, drawing, roving and spinning are the process involved in yarn manufacturing
- Weaving is interlacing of yarns at right angles in warp and weft direction
- Looms are used for the manufacturing of woven fabric
- Knitting is interlooping of yarns. It is made by circular or flat knitted machines
- Non-woven fabrics are entangled fibres, pressed together by mechanical, thermal or chemical processes

ACTIVITIES FOR THE TEACHER

- To collect woven, knitted and non-woven fabric samples and display in the class room to identify them

ACTIVITIES FOR STUDENTS

- To ask students to collect different types of yarns
- To aid students to collect Woven, Knitted and Non-Woven fabric Sample to prepare an album

GLOSSARY

1.	Yarn	Twisting of fibres together to form a thread
2.	Spun yarn	Made using short fibres
3.	Filament yarn	Continuous strand of yarn.
4.	Single yarn	Directly twisted from fibres.
5.	Ply yarn	Two or more single yarns are twisted.
6.	Cord Yarn	Two or more ply yarns are twisted.
7.	Yarn numbering	Yarn numbering systems used to express a relationship between a unit length and weight of yarns.
8.	Spinning	A Fibres are drawn and twisted together to form a yarn

XI_EM_TDD_CHAP03_2022.indd 34 24-01-2023 13:19:03

9.	Beam	Cylinder made of wood or metal used for holding warp yarns.
10.	Dent	Space between two reeds.
11.	Selvedge	Edge of the fabric parallel to warp
12.	Heddle	The heddles are metal strips with an eye located in the center through which the warp yarns are passed.
13.	Grain	The direction of yarns in a fabric

QUESTIONS AND ANSWERS

PART – I

OBJECTIVE QUESTIONS:

1. Filament yarns are _____.

   (a) Smoother (b) Bulky

   (c) Duller (d) Cooler

2. Staple fibres are _____ fibres.

   (a) Long (b) Bulky

   (c) Fine (d) Short

3. Ply yarns are made of _____ yarns.

   (a) Single

   (b) Two or more Single

   (c) Corded yarn

   (d) Warp

4. A gap formed for interlacing of filling yarns in the loom is called _____.

   (a) Picking (b) Shedding

   (c) Beating (d) Weaving

5. What is the name of raw cotton in ginning?

   (a) Kappas (b) Sliver

   (c) Lap (d) Chute

6. Short fibers are removed with the help of

   (a) Draw Frame

   (b) Card

   (c) Comber

   (d) Simplex

7. Which part of Rove frame is used for making a twist?

   (a) Flyer

   (b) Traveller

   (c) Flat comb

   (d) Doffer

8. The inserted weft yarn is moved to the correct position of the cloth with the help of the _____.

   (a) Cloth beam (b) Reed

   (c) Picker (d) Doffer

9. Application of starch to the warp yarn is known as _____.

   (a) Sizing (b) Beaming

   (c) Warping (d) Winding

10. Term denotes number of needles present in one inch of the knitting fabrics.

    (a) Course (b) Wales

    (c) Gauge (d) Rib

XI_EM_TDD_CHAP03_2022.indd 35 24-01-2023 13:19:03

PART – II

Answer in three (or) four points:

1. Define yarn.
2. Mention the types of yarn.
3. Classify yarn numbering system.
4. What is yarn twist?
5. Define course, wales and gauges.
6. What is warping?
7. Give the classification of knitting.
8. List the uses of non-woven fabrics.
9. Write short notes about parts of knitting machine.
10. List the types of loom.

PART – III

Answer in a paragraph:

1. Write a note on single, ply and cord yarns.
2. Describe yarn numbering system.
3. Explain the parts of a loom.
4. What are non-woven fabrics?
5. Brief on the properties of any five weaves.

PART – IV

Answer in one page:

1. Explain yarn manufacturing process?
2. With a neat diagram explain the loop formation of the latch needle.

Answers for Objective Questions:

1. (a) 2. (d) 3. (b) 4. (b) 5. (a)
6. (c) 7. (a) 8. (b) 9. (a) 10. (c)

XI_EM_TDD_CHAP03_2022.indd 36 24-01-2023 13:19:03

CHAPTER

4

TOOLS AND EQUIPMENTS FOR CLOTHING CONSTRUCTION

LEARNING OBJECTIVES

- To learn about different types of tools used in clothing construction
- To enable the students to choose and use appropriate sewing tools
- To gain knowledge on the selection of the appropriate needles, threads and stitch per inch for various fabrics.

4.1 INTRODUCTION

In clothing construction various tools and equipments are used, these help in the perfect fit and shape in any garments. Hence, it is important to learn about the use of these tools and their properties before constructing garments.

4.2 TOOLS USED IN DRESS MAKING

The tools used in dress making are classified as:

- Measuring tools
- Marking tools
- Cutting tools
- Stitching tools
- Pressing / Ironing tools

Measuring Tools

A perfect measurement is needed to construct a well fitted garment. The measuring tools help to note the distance between two points in the human body. Measurement is needed for pattern making and in drawing the paper pattern. The most important measuring tools are measuring tape, meter scale and ruler, (Figure 4.1).

Measuring Tape

A measuring tape is commonly known as inch tape. It is made of plastic or a narrow ribbon like cloth with markings for measurement. It can also be called as a flexible ruler. It has a long metal strip on one side and a short curved metal strip on other side to hold the tape firmly. The measuring tape has a marking of 60 inches on one side and 150 cm on the other side It is used for taking body measurements and for drawing patterns on paper and fabric.

Meter Scale

Meter scale is a wooden, plastic or steel thin narrow strip marked in inches and centimeters on either side. It is used to draw paper pattern and to mark pattern measurement on fabrics.

XI_EM_TDD_CHAP04_2022.indd 37 24-01-2023 13:20:46

Ruler

Ruler is also known as scale or foot ruler. It is a plastic, wooden or metal strip which is marked at regular intervals. Normally the marking is marked in inches on one side and centimeters on the other side. It is used to draw straight line.

L-Square

L-Square, normally known as Tailor's square.It is an 'L' shaped scale. It is used for drawing typical squares or rectangles. It has both inches and centimeters marked. It is available in wood, steel and plastics.

French Curve

French curve is a flat template made out of wood, plastic or metal. It is composed of many curves. It is used for drawing curved lines like necklines and armscye lines in dress making. It helps in marking scalloped designs.

The ancient Egyptians used **the cubit** to measure. It was the length of the arm from the elbow to the tip of the middle finger. (Roughly 18 inches)

Marking Tools

Marking tools are used for drawing or transferring the patterns on paper or fabrics. These tools are used for marking the cutting lines, darts, tucks, neck curves, connecting lines and shapes, (Figure 4.2)

Tracing Wheel

Tracing wheel is a small circular metal wheel attached to a metal or wooden handle. The disc has sharp teeth. This helps to create impression on the pattern, which indicates the cutting lines. It is used for transferring very small pattern details on the fabric (Examples: Darts, notches). It is used for marking more number of fabric layers at the same time.

Colour Pencils (Red and Blue)

Colour pencils are ordinary pencils which are available in the market. It is used for drawing the patterns on paper. Red colour is used for marking the cutting lines and the blue colour is used for marking tucks, darts and seam lines.

Marking Chalk

Marking chalk is a hard chalk used for marking patterns. It is also called as Tailor's chalk. It is used to draw the outline of the garment on the fabric. It is available in three colours (red, blue and yellow) and two shapes namely triangle and square. With the help of these chalks, curved parts can be drawn easily on the fabric.

Measuring Tape Meter Scale Ruler L-Square French curve

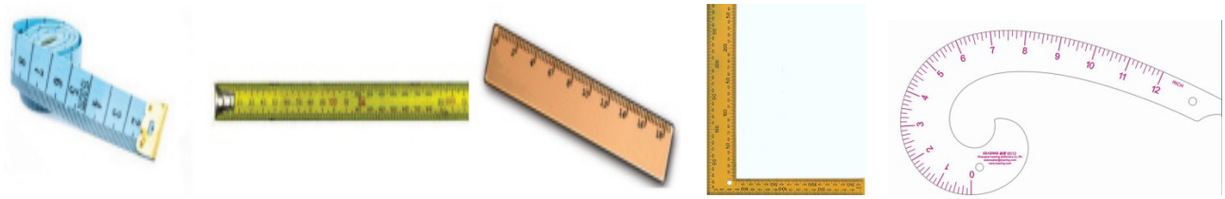


Figure 4.1 Measuring Tools

XI_EM_TDD_CHAP04_2022.indd 38 24-01-2023 13:20:46

Tracing Wheel

Colour Pencils (Red and Blue)

Marking Chalk

Figure 4.2 Marking Tools

Cutting Tools

Cutting tools are used for cutting paper patterns, fabrics and thread, (Figure 4.3)

Scissors

Scissors have round shaped handle with two sharp blades. The length of blades varies from 10 to 15 cm. The handles are made of plastics or metals. It is used for cutting threads and fabric edges in a proper way during stitching.

Shears

Shears is a bigger and heavier scissor with a small ring as handle for thumb and a larger ring for the other four fingers. The length of these blades ranges from 20 to 30 cm. It is also called as Tailor's shears, (Figure 4.3).

While cutting the fabric, the handle of the shears should touch the table and the sharpened edge must be slightly higher than the table level. A fabric cutting shears should only be used for cutting the fabrics.

Pinking Shears

Pinking shears are shears with sharp toothed zig zag edges. They are lighter in weight when compared to shears. It is used for creating decorative edge in fabric. It also prevents the raveling of yarns from the fabric edges.

Electric Scissors

Electric scissors are operated with power. They are similar to scissors. Electric scissors are used for cutting light and heavy weight fabrics more easily and quickly, (Figure 4.3).

Seam Ripper

It is a simple pen-like device that allows the removal of machine or hand stitched seams. It

Scissors

Shears

Pinking Shears

Figure 4.3 Cutting Tools

XI_EM_TDD_CHAP04_2022.indd 39 24-01-2023 13:20:46

Figure 4.3 Cutting Tools

cuts the stitches in an accurate and safe manner. A seam ripper is the best equipment to rip or open seams. While removing the stitches, the fabric should not be pulled as it can stretch and easily tear the fabric.

Thread Cutter

It is a small handy spring loaded tool. It is specifically used for cutting extra threads on the garments and ripping seams. Threads are simply cut by pushing the upper blade down with the thumb.

Cutting Table

It is a large, flat table used for spreading the fabric and patterns while marking, pinning, and cutting. They are often covered with thick felt, which allows the pins to be placed into the surface.

Notcher

It is a tool commonly used in pattern making and sewing. It is used to create notches in the paper pattern material. A notch is one or more triangle cuts made in two pieces of garments to match those points and stitch. Example: armscye line of the sleeve with bodice sleeve line.

Stitching Tools

Stitching tools are the tools which enhance the sewing action by hand and machine. The common stitching tools are needle, thread and thimble, (Figure 4.4)

Needle

Needles are thin, long metal stick like structures. It has a sharp edge on one end and hole called eye on the other end. The thread used for sewing is passed through the eye. Needles used for hand sewing or embroidery is called hand needle. Needle which is used in the machine is called machine needle. The size and number of the needle varies based on the type of fabric stitches, In this reference, sharp pointed needles are used for woven fabrics, ballpoint needles for knitted fabrics and wedge pointed needles are used for leather garments.

Thimble

Thimble is a small tumbler shaped tool. It is made up of plastic or metal. It is used to protect the finger from being pricked by the needle when sewing. It is used in the middle finger.

Bell pin

Bell pins are thin metal needle like structures with a circular head on the top. They are available in different thickness and heights. Generally medium height thin pins are used for pattern and dress making. It helps to hold the patterns in place while transferring the pattern details on fabrics. They are also used for marking patterns on slippery fabrics.

Pin Cushions

Pin cushions are small foam pads to hold pins. This prevents the slipping of

XI_EM_TDD_CHAP04_2022.indd 40 24-01-2023 13:20:46

pins while working on patterns, draping, cutting and sewing. They are available in different sizes and shapes.

Sewing kit

Sewing kit is a small package which has necessary items that are needed for sewing. The essential items that a sewing contains are threads, needles, scissors, seam rippers, pins, pin cushions, hand sewing needles, tailors chalk, fabric markers, measuring tape and pattern master rulers.

Bodkins

A bodkin is a very useful tool in sewing. It is a threading tool used to insert elastic, fabric tubes, ribbons, cord, easily and smoothly. It is also used to make the corners of stitched fabric pointed for example collar points.

Ironing Tools

Ironing is the process of removing wrinkles from stitched garments. Ironing is the last step in dress designing. It is very important because it results in a neat finish and enhances the look of the garment, (Figure 4.4)

Steam Ironing

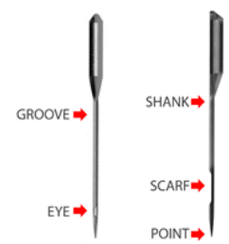
The iron is pre-heated up to its selected working temperature. The iron is applied directly to the upper textile surface of the item being ironed. During the ironing process, heat is transferred into the material by conduction. In this type of ironing process, steam aids the transfer of heat by penetrating into the structure of the textile yarns.

Who invented Scissors?

Early scissors were used in Europe until the 16th century. The other type of scissors, known as pivoted scissors, were invented by the Romans around 100 A.D. Pivoted scissors are made of two cross blades that pivot somewhere between the tip and handles; these are the scissors that are most commonly used in modern times.

Iron Box

Iron box is made up of metal (Aluminum, steel or copper). It is heated with charcoal. Today Teflon coated iron boxes are available. This is heated by steam. Electrical iron box is the best for ironing textile materials and garments.



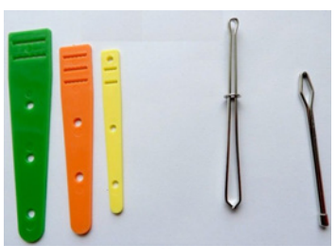
Needle

Thimble

Bell pin

Pin Cushions

Sewing Kit


Bodkins

Steam Ironing

Iron Box

Iron Board

Figure 4.4 Stitching and Ironing Tools

XI_EM_TDD_CHAP04_2022.indd 41 24-01-2023 13:20:46

Iron Board

For ironing, special boards are also available in the market. They have padded tops, covered with suitable fabric. This helps in ironing. The height varies based upon the height of the user. It should be kept in a perfect flat surface without any ups and downs.

4.3 INDUSTRIAL CUTTING MACHINE

Straight Knife Cutting Machine

In garment industry fabric cutting is an important task. Layers of fabrics should be cut in the required shape and size. Therefore the following machines are used in the industry, (Figure 4.5).

It is a cutting machine basically used for cutting fabrics with perfect edges. This machine has a base plate and an upright stand to hold the vertical blade. Straight knives are available in different sizes and different blade speeds. It is widely used in the garment industry. We have to know the machine according to the pattern through fabric for cutting. Fabric is stationary here.

Straight knife machine

Round knife cutting machine

Figure 4.5 Industrial Cutting Machines

Round Knife Cutting Machine

It has a base plate with an electric motor placed above it, with a handle to direct the blade for cutting as per the requirement. It is used for fabric cutting in garment factories. It is not used as commonly as the straight knife cutting machine, but it is used for some specific purpose like cutting single ply as well as multi-layer. It is also suitable for gentle curve line cutting.

Band Knife Cutting Machine

This is an electrically operated machine with fine blades. The machine operator controls the speed based upon the type of the fabric and layers to be cut. Here cutting machine is stationary, we have to move the fabric for cutting according to the marking.

Die Cutting Machine:

It is a small die with sharp edges. It is used to cut small pattern pieces. They are available in different shapes and sizes. Example: Collar, Cuff, Pockets.

Sewing Thread

It is used as a raw material to stitch fabrics together. Though it is an accessory it is considered important in garment manufacturing. It varies in size, colour and strength. Thread size is generally termed as the "Ticket Number". This is the relation between threads per unit to its weight. In the metric system it is the number of thread per gram. It is expressed as Nm. Example: If one gram of single ply thread is 50m long, then Nm is 50/1. In case of double plied, then the Nm is 50/2, since the weight of the threads is 2gm (Two ply threads are twisted together).

XI_EM_TDD_CHAP04_2022.indd 42 24-01-2023 13:20:46

4.4 SELECTION OF NEEDLE, THREAD AND STITCH FOR VARIOUS FABRICS

There is no rigid rule for the selection of needle and thread but it should be chosen mainly as per the type of fabric. The recommended needle and thread selection is given in Figure 4.6.

Fabric Type/Application		Thread		Size of Needle
		Type	Size	
Medium weight Fabric	Broadcloth	Cotton thread	60-90	75/11—90/14
	Taffeta	Synthetic thread		
	Flannel/Gabardine	Silk thread	50	
Thin Fabrics	Lawn	Cotton thread	60-90	65/9-75/11
	Georgette	Synthetic thread		
	Challis, satin	Silk thread	50	
Thick fabrics	Denim	Cotton thread	30	100/6
			50	90/14-100/16
	Corduroy	Synthetic thread	50-60	
	Tweed	Silk thread		
Stretch fabrics	Jersey	Thread for knits	50-60	Ball point needle 75/11—90/14 (gold coloured)
	Tricot			
Easily frayed fabric		Cotton thread	50-90	65/9-90/14
		Synthetic thread		
		Silk thread	50	
For top- stitching		Synthetic thread	30	100/6
		Silk thread	50-60	75/11—90/14

Figure 4.6 Selection of Needle, Thread and Stitch for Various Fabrics

4.5 SUMMARY

In clothing construction various tools are used to take body measurements, draft pattern, transfer patterns to fabrics, cut and sew garment and finally iron them neatly. Each of these tools should be selected and maintained with great care.

POINTS TO REMEMBER

- Good quality tape is needed for body measurements.
- Marking tools are used to mark different parts and cutlines.
- Stitching tools are used while sewing or embroidering.
- Pressing tools are used to remove wrinkles.

ACTIVITIES FOR THE TEACHER

- Display the pictures of various tools and explain their functions
- Train students to identify various sewing tools

ACTIVITIES FOR STUDENTS

- Draw the tools used for measuring & marking.

XI_EM_TDD_CHAP04_2022.indd 43 24-01-2023 13:20:46

GLOSSARY

1.	Garment construction	Process of creating a new garment
2.	Drafting	Method of drawing pattern with mechanical precisions on paper
3.	Stitching	Joining two pieces of fabric
4.	Pressing	Process of removing crease from a fabric by placing iron on the fabric
5.	Meter scale	Device used for measuring
6.	Notcher	Tool used for making notches in patterns and fabrics
7.	Bell pins	Pin used for holding the paper pattern with cloth
8.	Thimble	Cap worn to protect middle finger while sewing
9.	Scissors	Used for cutting thread
10	Straight knife cutting machine	Machine used for cutting patterns in the garment industry

Internet resources

https://www.youtube.com/watch?v=I-bw5IL0Vfc	Sewing Kits for Beginners
https://www.youtube.com/watch?v=G-6yvVFZ9aY	Beginner's Sewing Tools

QUESTIONS AND ANSWERS

PART – I
Objective Questions

1. Pick out the Measuring tool.

   (a) Dress model (b) Ruler (c) Thread (d) Tracing wheel

2. An important tool in taking body measurement.

   (a) Scale (b) Measuring tape (c) Tracing wheel (d) Thread

3. To prevent the fingers from needle pricking we must use this tool.

   (a) Needle (b) Scissor (c) Thimble (d) Thread

XI_EM_TDD_CHAP04_2022.indd 44 24-01-2023 13:20:46

4. The red colour pencil helps to mark _____.

(a) Stitching line (b) Cutting line (c) Darts (d) Seam line

5. Which tool is used to transfer pattern marking on fabric layer?

(a) Tracing wheel (b) Tailors chalk (c) Pins (d) Colour pencil

6. The length of measuring tape is _____.

(a) 100 cm (b) 110 cm (c) 130 cm (d) 150 cm

PART – II

Answer In Three (Or) Four Points:

1. Write a note on marking tool
2. State the uses of marking chalk and tracing wheel.
3. Define steam ironing
4. How is a measuring tape used?
5. What is the use of thimble?

PART – III

Answer in a Paragraph

1. Write the difference between shears and scissors.
2. What are stitching tools? Give example
3. Describe industrial cutting machine
4. Write a detailed note on pressing /ironing tool

PART – IV

Answer in one Page:

1. Give a detailed note on the different types of tools used for garment construction.

Answers for Objective Questions:

1. (b) 2. (b) 3. (c) 4. (b) 5. (a) 6. (d)

XI_EM_TDD_CHAP04_2022.indd 45 24-01-2023 13:20:46

CHAPTER

5 INTRODUCTION TO SEWING MACHINE

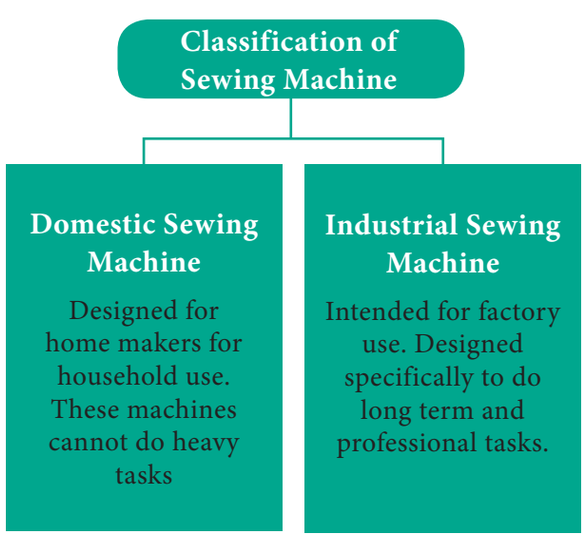
LEARNING OBJECTIVES

- To understand the concept of sewing
- To learn about the types and parts of industrial and domestic sewing machines
- To know about different types of sewing machines used in industries
- To study about different types of folders/attachments used in industrial sewing machine
- To get trained in maintaining the sewing machine

5.1 INTRODUCTION

A sewing machine is described as a device that joins fabric using thread either mechanically or electrically. A French tailor Barthélemy Thimonnier (1829) developed the first sewing machine, which is still commonly used with modifications. Today, sewing machines range from simple home sewing machines to highly developed electric sewing machines with many advantages like automatic thread clipping and thread sucking devices. Some of these machines are also computerized.

5.2 CLASSIFICATION OF SEWING MACHINE



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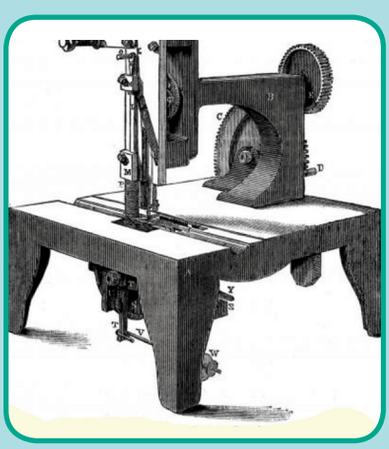
Domestic Sewing Machine

Sewing machine came to India in the year 1935 for the first time, Usha Sewing Machine was made by J.J. Engineering Company. Domestic sewing machines were generally designed for one person to sew individual items using a single row of stitches at a slow speed. But today, with technological improvements these machines vary from fully automatic, computerized and/or electrical machines. This improvement has increased the smooth operation and stitching capacity of the domestic sewing machines.

Who patented the Singer Sewing Machine?

The Singer Sewing Machine is Patented. Isaac Merritt Singer did not invent the sewing machine, but he patented the first practical and efficient one, on August 12th, 1851.



Industrial Sewing Machine

Industrial sewing machines are larger, faster, and more varied in their size, cost, appearance, and task when compared to the domestic sewing machines. Long term, professional sewing tasks are assured by industrial sewing machines. They are made with super superior durability, parts and motors. The speed of the motor can be modified as low, medium and high. It can sew through thin thick fabrics, single to multilayer fabrics. It is used for the construction of upholstery, leather, jute and denim fabrics also.

Industrial Machine are classified as

- Embroidery machine
- Pico machine
- Inter lock machine
- Over lock machine
- Button fixing and Button hole machine

Embroidery Machine

- Embroidery machine is used to create embroidary patterns on textiles, (Figure 5.1).
- Used commercially in product branding, advertising and uniform adornment
- In apparel industry, it is used to decorate garments and home decors.

Purpose: Design on garments, quilts, pillows and wall hangings.

Pico Machine

- Pico machine is used to create zig-zag stitch, (Figure 5.2).
- It is the process in which fabrics are folded from the edge and then stitched.
- Used for joining two worked fabric pieces edge to edge.

Purpose: Used for finishing items, shirts, T-shirts and jackets.

Inter Lock Stitch Machine

- This machine makes lock stitches, (Figure 5.3).

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- Lock stitches are formed with one needle thread and one bobbin thread.
- This is widely used for sewing stitch class 301, light, medium and heavy materials

Purpose: Single needle lock stitch machines are used for joining two or multiple fabric plies together.

Over Lock Machine

- Over lock machines are available in 3, 4 and 5 threads for over edge sewing, (Figure 5.4).
- This can form various types of stitches like stich classes 503, 504 and 501.

Purpose: This machine is used for overcasting garment panels, finishing edges of knitted garment. Eg. Trouser panels, side seam of a T-shirts.

Button Sewing Machine

- A special machine used only for stitching button.
- Different sizes of button can be attached using this machine by changing the settings, (Figure 5.5).

Purpose: Used to attach button.

Button Hole Machine

- This machine is used for making button holes on garment, (Figure 5.6).

Purpose: Button holes can be made with different stitch density in shirts, trousers and polo shirts and other fancy garments.

Figure5.1
Embroidery Machine

Figure 5.2
Pico Machine

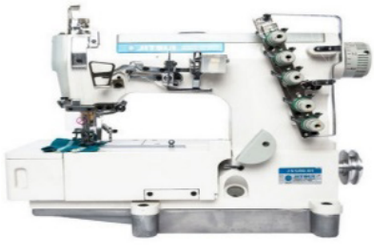

Figure 5.3
Inter Lock Stitch Machine

Figure 5.4
Over Lock Machine

Figure 5.5
Button Sewing Machine

Figure 5.6
Button Hole Machine

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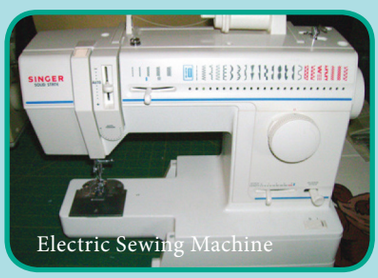
When was electric sewing machine invented?

The first electric machines were developed by Singer Sewing Co. and introduced in 1889. By the end of the First World War, Singer was offering hand, treadle and electric machines for sale.



Electric Sewing Machine

5.3 PARTS AND FUNCTIONS OF A DOMESTIC SEWING MACHINE

Parts and functions of a sewing machine, (Figure 5.7) are listed below;

Spool Pin

Spool pin is a small metal rod on the body of the sewing machine. The main function of spool pin is to hold the spool of thread, (Figure 5.8).

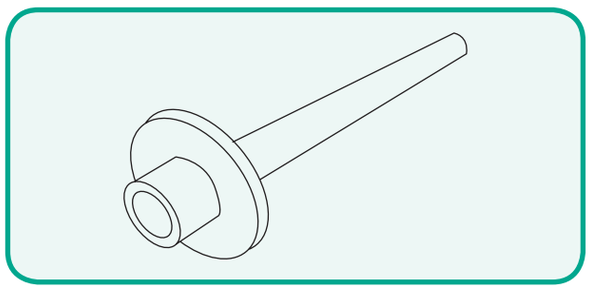


Figure 5.8 Spool Pin

Thread Guide

Thread guide is a small metal ring, on the face of sewing machine. It keeps the thread in position and guides the thread from the spool to the needle.

Tension Disc

Tension disc is a metal spring with concave disc and screw. The thread is fed into the tension disc in between the two concave disc, screw and spring to pass the thread freely to the needle. The screw can

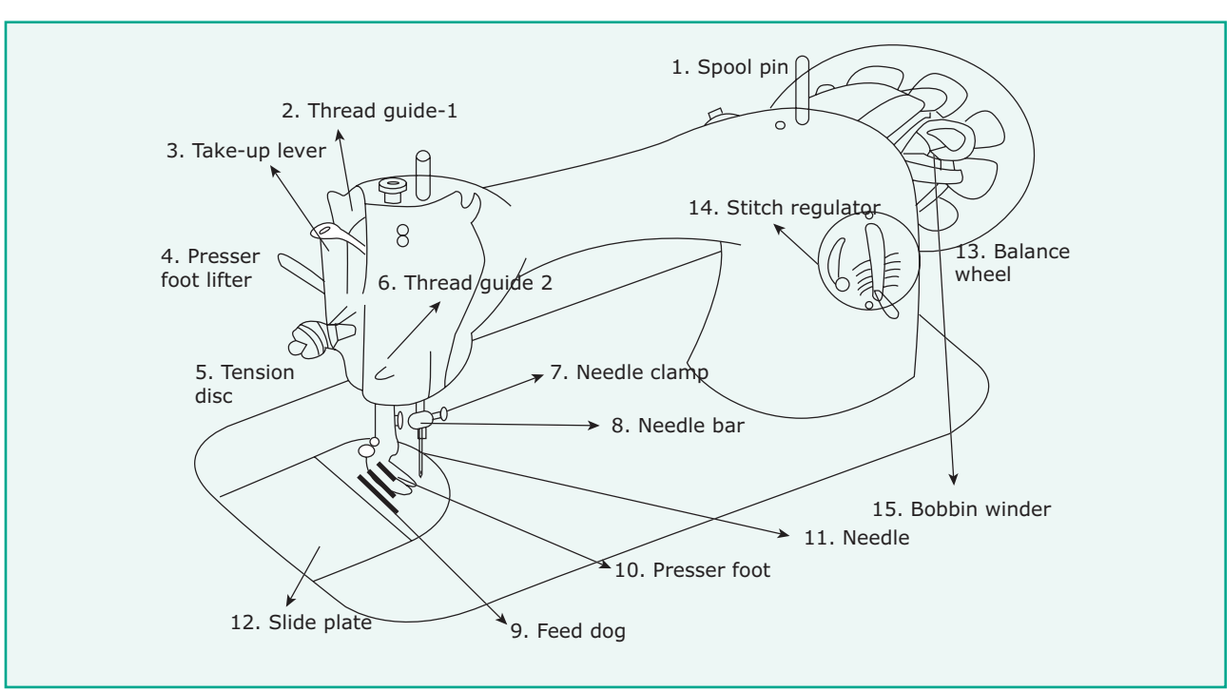


Figure 5.7 Domestic Sewing Machine

XI_EM_TDD_CHAP05_2022.indd 49 5/3/2022 9:50:43 AM

be adjusted to increase or decrease the tension, (Figure 5.9).

Figure 5.9 Tension Disc

Take-up Lever

Take up lever is, hook shaped and the thread is passed through this to make upward and downward position, to pull thread in the sewing machine and to enable the needle to stitch.

Needle Bar

Needle bar is a steel rod to hold the needle at one end with help of a clamp.

Bobbin Case

Bobbin case is a metal circular cap shaped part which holds the bobbin. The upward thread helps to bring the lower thread in the bobbin from the bobbin case to make a stitch, (Figure 5.10).

Figure 5.10 Bobbin Case

What is a Bobbin?

A bobbin is a small cylinder like structure, on which wire, yarn, thread or film is wound. In non-electrical applications the bobbin is used for tidy storage without tangles. A bobbin provides temporary or permanent storage for yarn and may be made of plastic, metal, bone, or wood.

Presser Foot

Presser foot is a heavy fork shaped steel rod which is attached to the presser bar. Presser foot holds the fabrics in the place while sewing, (Figure 5.11).

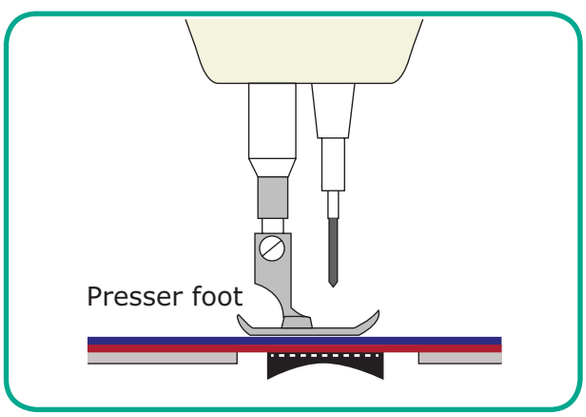


Figure 5.11 Presser Foot

Presser Foot Lifter

Presser foot lifter is a lever attached to the presser bar. It is controlled by the presser foot and helps in raising and lowering the presser foot.

XI_EM_TDD_CHAP05_2022.indd 50 5/3/2022 9:50:43 AM

Stitch Regulator

Stitch regulator is a small vertical bar with markings and a knob. It controls the length of the stitch on the fabric.

Bobbin Winder

Bobbin winder is a small rod in the front side of the wheel. It is used to wind thread and it controls the bobbin while winding thread. Bobbin winding should be carried out in medium speed. Increase in speed will result in stretching of the sewing thread which may result into breakage, (Figure 5.12).

Figure 5.12 Bobbin Winder

Fly Wheel

Fly wheel is a circular metal ring which helps the movement of the machine. It can be rotated manually or by power. It lowers and raises the sewing machine needle, (Figure 5.13).

Figure 5.13 Fly Wheel

Clutch / Thumb Screw

Clutch or thumb screw is attached in the middle of fly wheel. If the screw is the machine will not work. Thumb screw controls stitching.

Slide Plate

This is a rectangular metal plate. It can be moved to insert and remove the bobbin.

Needle Plate

It is a semi -circular metal plate with a small hole through which the needle passes through. The needle enters inside the hole and picks the bobbin thread, (Figure 5.14).

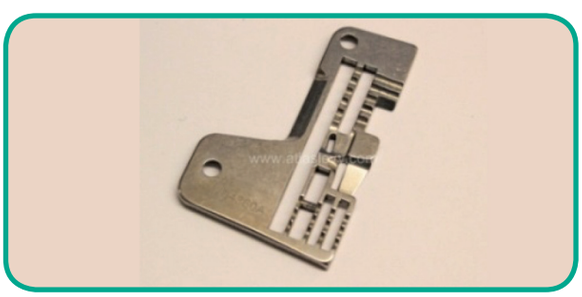


Figure 5.14 Needle Plate

Feed Dog

The feed dog is a set of metal teeth. The feed dog helps the fabric to move after each stitch, (Figure 5.15).

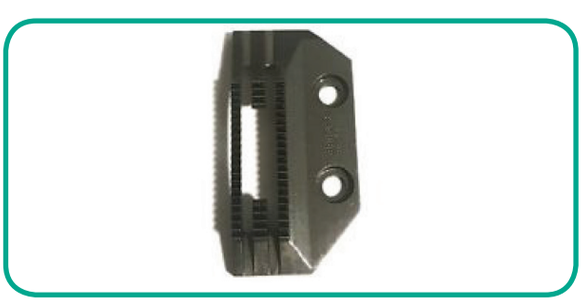


Figure 5.15 Feed Dog

Face Plate

Face plate is a metal plate covering the needle bar, presser bar and take up lever.

XI_EM_TDD_CHAP05_2022.indd 51 5/3/2022 9:50:43 AM

It covers these parts and prevents them from dust, (Figure 5.16).

Figure 5.16 Face Plate

Pedal

It is made up of iron. It is pressed by foot to give pressure for the work of sewing machine. Pedal is found in leg operating machines which is connected to fly wheel through a belt.

Parts and Functions of an Industrial Sewing Machine

The parts (Figures 5.18-34) and functions of the industrial sewing machine is explained below;

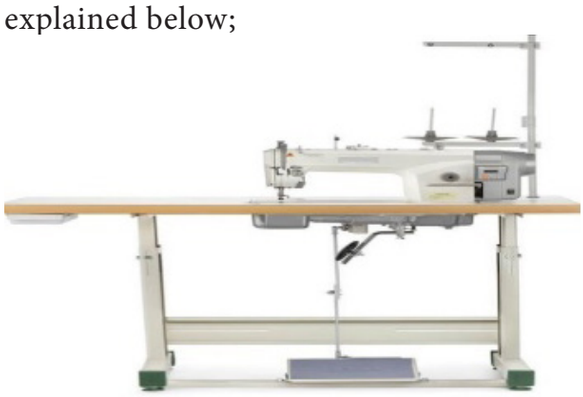


Figure – 5.17 Industrial Sewing Machine

- **Foot Pedal:** Based the force given by the operator the foot pedal controls the speed of the machine.
- **Hand Wheel:** The sewing needle can be raised or lowered down slowly with the help of the hand wheel.
- **Reverse Lever:** Makes reverse stitching while sewing at the end of every seam to secure it.
- **Thread Spindle:** Holds the sewing thread and controls its direction while sewing.
- **Bobbin Winder:** It is used to wind the bobbin thread on bobbins.
- **Stitch Regulator:** Adjust the stitch length for different applications.
- **Tension Disc:** Determines thread tension the looseness or firmness of the stitch.
- **Needle Clamp:** Fixes the needle in place.
- **Take Up Lever:** Helps in supply of thread and loop formation.
- **Pressure Foot:** Grabs the fabric and place it to the feed dog, to have smooth movement of the fabric while sewing.
- **Pressure Dial:** Determines the amount of pressure to be given on the fabric through the pressure foot, for easy movement of the fabric while sewing.
- **Feed Dog:** A 'teeth like' component which helps the fabric to move after each stitch.
- **Throat Plate:** It has plate with a hole for the needle to go through to the bobbin casing and draw the bobbin thread for stitch formation.
- **Pressure Foot Lifter:** Engages the pressure foot on the fabric against the feed dog gently.
- **Bobbin Case:** It is the case that holds the bobbin.
- **Bobbin:** Carries the bottom sewing thread and is fitted onto the bobbin case.
- **Knee Lifter:** The operation of raising and lowering the pressure foot is carried out by a lever which is attached in the front of sewing machine. It is pushed by knee or thigh of the operator, for easy sewing.

XI_EM_TDD_CHAP05_2022.indd 52 5/3/2022 9:50:43 AM

Parts of an Industrial Sewing Machine

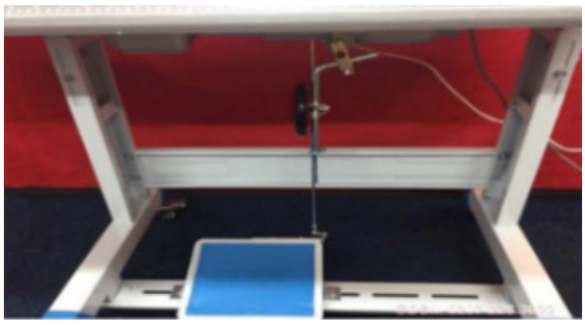


Figure 5. 18 Foot Pedal

Figure 5. 20 Reverse Lever

Figure 5. 22 Bobbin Winder

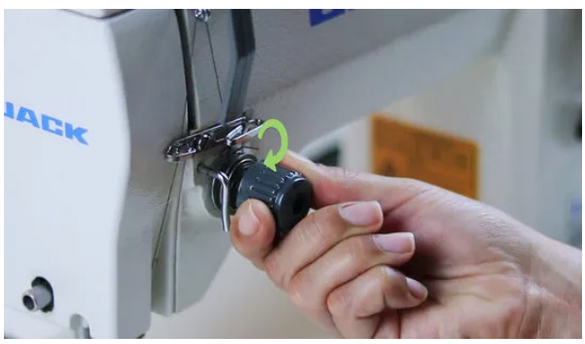


Figure 5. 24 Tension Disc

Figure 5. 19 Hand Wheel

Figure 5. 21 Thread Spindle

Figure 5. 23 Stitch Regulator

Figure 5. 25 Needle Clamp

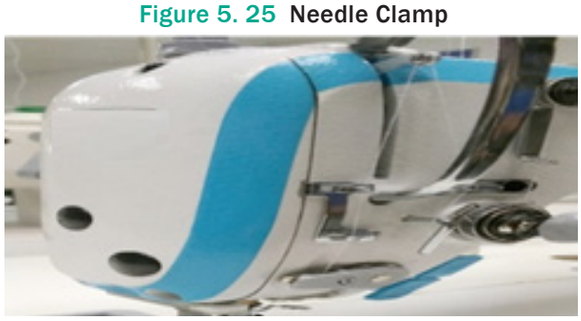


Figure 5. 26 Take Up Lever

XI_EM_TDD_CHAP05_2022.indd 53 5/3/2022 9:50:43 AM

Parts of an Industrial Sewing Machine

Figure 5. 27 Pressure Foot

Figure 5. 28 Pressure Dial

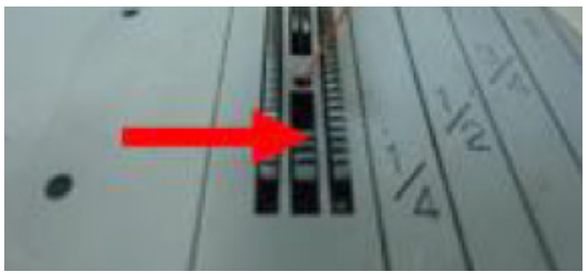


Figure 5. 29 Feed Dog

Figure 5. 30 Throat Plate

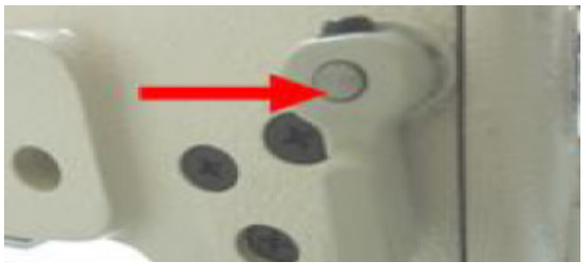


Figure 5. 31 Presser Foot Lifter

Figure 5. 32 Bobbin Case

Figure 5. 33 Bobbin

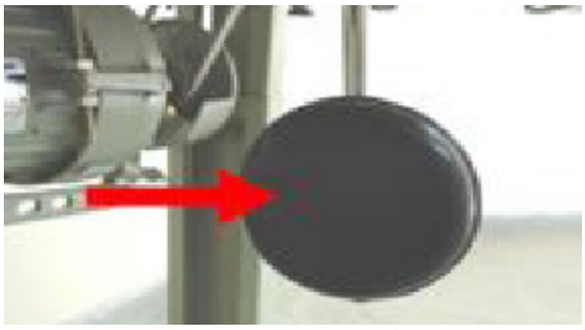


Figure 5. 34 Knee Lifter

Selection of Needles and Threads

- Universal Needle

  These are the standard needles among sewists and they work well with synthetics, woven fabrics and some varieties of knit fibres. Universal needle is ideal for silk, polyester or cotton threads.

- Ballpoint and Stretch Needles

  Ballpoint needles have a round tip that pushes the material without cutting them. They have a point that glides between the knit fabric loops and does not pull the fibres from fabric. Stretch needles have a part called 'Scarf' which gives more space for the hook to pass through and it prevents skipped stitches. It is ideal for lycra, Silk jersey, highly elastic synthetic materials and spandex.

XI_EM_TDD_CHAP05_2022.indd 54 5/3/2022 9:50:43 AM

- Microtex and sharp
  These needles are sharp, very slim and easier for piercing of very fine or densely woven fabrics. Microtex and sharp needles are perfect for silks, microfibre fabrics, foil or fine artificial leather. Sizes 60 through to size 90
- Leather needle
  It is a long needle between 6-10 cm in length, with a long eye and a sharp triangular point. The shape of this needle will enable it to pierce and pass through leather and leather like materials without tearing the ground material. They are available in a range of thicknesses, lengths, with varying-shaped-points, and varying sizes eyelets.
- Denim needles
  Jeans/Denim needles are made for penetrating extra thick woven fabrics and denims with minimum needle deflection. This need helps to minimize skipped stitches and needle breakage. The most popular denim needle size among sewist is size 100/16
- Handicap/ self-threading needles
  Handicap needles are commonly known as self-threading needles. These are ideal for who have difficulty threading the eye of the needle. This universal tipped needle has tiny slot on the side of the eye, allowing you to easily slide the thread down the needle into the eye.

5.4 FOLDERS/ATTACHMENTS USED IN APPAREL INDUSTRY

Folders/attachments are additional tools to sewing machine that helps to perform specific tasks. Various types of folders are available in different sizes and thickness. They are classified as light folders (0.15m 0.25m thickness material), medium folder (0.27mm to 0.40mm materials) and heavy folder (0.45m to 1.5mm materials). The basic advantages of the folder are increased productivity; maintain quality, easy to use, lesser time consumption and folders used for simple to complex tasks.

Types of folders

- **Presser Foot Folder** - holds the fabric flat and enables sewing without wrinkles
- **Hemming Folder**- used for continuous hemming
- **Rolled Hem Foot** – to create rolled hem finish
- **Sleeve Attachment Folder**-for sleeve attaching operation
- **Piping Folder**-for making piped seam
- **Belt Loop Folder**- used for preparing belt loop
- **Bias Binding**-to bind the fabric edge evenly with fabric strip
- **Waist Band Folder** - used for attaching waistband
- **Yoking Folder** - for making yoke
- **Lap Seam Folder**- for ease in making lap seam
- **Sleeve Placket Folder**- used to sew continuous facing in sleeve
- **Elastic Attachment** - designed for making shirred waist band
- **Zipper Attachment**- used to attach zippers

XI_EM_TDD_CHAP05_2022.indd 55 5/3/2022 9:50:43 AM

- **Invisible Zipper Foot**- inserts invisible zippers
- **Open Toe Applique Foot** –attaches applique
- **Button Sewing Foot**- used for sewing the buttons
- **Buttonhole Foot**- stiches neat and uniform buttonholes
- **Pintuck Foot**- ease to stitch pintucks
- **Edge Stitch Foot**- used for straight top stitching
- **Patchwork Foot**- marks lines for quilting and patch work.
- **Non-Stitch Foot**- sews leather and other non textile materials
- **Ruffler Attachment**- used for making uniform ruffles
- **Cording Foot** – used for inserting cords

5.5 CAUSES OF FAULTS AND REMEDIES OF THE SEWING MACHINE

Problems faced while sewing and the method of solving the problems are listed below;

Breaking of Thread	
Reason	**Remedies**
• Unsuitability of thread used for the fabrics.	• Suitable thread should be used for the fabrics, (For silk fabrics, thin thread).
• If tension disc is too tight.	• Correct the tension.
• Using low quality thread.	• Use high quality thread.
• Rotating the wheel in anti-clock wise direction.	• Care to be taken to rotate the wheel in clock-wise direction.
• The thread cuts when the machine is sewed in thicker layers of fabric.	• Cut the broken thread, and sew again by slightly lifting the presser foot.
• Fast movement of the fabric.	• Life up the presser foot and slowly pull the fabric to its place and then stitch.
• Fixing of needle unevenly.	• Attach the needle correctly.

Breaking of Needle	
Reason	Remedies
• Using unsuitable kind of needle.	• Check and use correct needle.
• Fixing of needle at lower lever.	• Fix the needle correctly.
• If needle is blunt.	• Use a straight needle.
• If shaft is lower.	• Check the position of the needle in the needle bar.
• Pulling of the garment backward while stitching quickly.	• Raise the presser foot, lift the needle and carefully remove the garment.
• Needle Heat	• Use good quality of Needle

XI_EM_TDD_CHAP05_2022.indd 56 5/3/2022 9:50:43 AM

Looped Stitch	
Reason	**Remedies**
• Supply of too much needle thread (Top) while stiching	• Adjust the tension disc for correct tension on top thread
• If tension disc is loose, the loops are formed.	• Correct the tension disc.
• Supply of too much of bobbin thread	• Adjust the tension screw on the bobbin case

Formation of Crease in the Fabric	
Reason	**Remedies**
• If belt is small in size.	• Use correct size belt.
• High pressure excerted on fabric	• Reduce the pressure on fabric by adjusting the pressure bar screw
• Uneven / loose winding of thread in the bobbin.	• Rewind the thread.
• Adherence of dust in the feed dog.	• Clean the feed dog.
• Winding of fabric in the fly wheel.	• See that fabric is not wound in the fly wheel.

5.6 SUMMARY

Sewing machines have laid a strong foundation for the development of clothing and fashion. The Old Stone Age man used bone as needles and twigs to sew leaves for his clothing, but today man has a wide range of machines. Even motor machines which can stitch buttons, make hems and embroidery are available. Digital machines are also found in the market. This has given a great leap to the garment industry.

POINTS TO REMEMBER

- Sewing machine was introduced during the 18th century.
- Sewing machine is made up of many parts like spool pin, thread guide, take up lever, needle bar and so on.
- Stitches can be adjusted using the stitch regulator.
- Use of folders maintains quality and increases productivity.
- While sewing, one is likely to face many problems like breaking of thread and needles. This can be avoided or corrected by suitable methods.

ACTIVITIES FOR THE TEACHER

- To show the problems faced during sewing and means to overcoming them.

ACTIVITIES FOR STUDENTS

- Draw a sewing machine and name its parts.
- Collect pictures of different types of sewing machines.

XI_EM_TDD_CHAP05_2022.indd 57 5/3/2022 9:50:43 AM

GLOSSARY

1.	Bobbin	Parts of sewing machine that holds the bottom thread.
2.	Bobbin case	Part which holds the bobbin.
3.	Stitch regulator	Helps to adjust stitch length.
4.	Spool pin	Holds the Needle thread.
5.	Feed dog	Helps to move the cloth forward.

INTERNET RESOURCES

https://www.youtube.com/watch?v=MC9nYWY9F6Q	Sewing Machine Parts and their Functions
https://www.youtube.com/watch?v=_4Kl8l9uAjM	Parts and Terminology of Sewing Machine and their Functions

QUESTIONS AND ANSWERS

PART – I

Objective Questions:

1. The needle bar is covered by _____.
   (a) Embroidery plate
   (b) Thumb screw
   (c) Side plate
   (d) Face plate

2. In India the first sewing machine was introduced in the year _____
   (a) 1845 (b) 1832
   (c) 1790 (d) 1935

3. Threading the bobbin is carried out with the help of _____
   (a) Spool pin
   (b) Bobbin
   (c) Bobbin case
   (d) Bobbin winder

4. The movement of the cloth forward is carried with the help of _____
   (a) Pedal
   (b) Bobbin case
   (c) Feed dog
   (d) Needle bar

XI_EM_TDD_CHAP05_2022.indd 58 5/3/2022 9:50:44 AM

5. The operation of the sewing machine is carried out by rotating the _____

(a) Fly wheel (b) Presser foot

(c) Pedal (d) Tension disc

6. Which machine is used for creating patterns on textiles?

a) Pico b) Interlock

c) Embroidery d) Bar tacking

7. Identify the machine that makes the lock stitches.

a) Pico b) Bar tacking

c) Embroidery d) Interlock

8. In an industrial sewing machine ----------determines the loose or firm of the stitch.

a) Tension disc b) Stitch regulator

c) Bobbin d) Spool pin

PART – II

Answer In Three (Or) Four Points:

1. Write the classification of sewing machine.
2. Classify industrial sewing machine.
3. Brief on causes for thread breakage.
4. What are the functions of Pico machine?
5. Differentiate button hole and button sewing machine.

PART – III

Answer in a Paragraph

1. Give a brief note on embroidery, Pico and interlock sewing machines.
2. What are the reasons and rectification for needle breaking?
3. Mention the functions of a knee lifter.
4. State the causes for looped stitch and its rectification.

PART – IV

Answer in one Page:

1. Explain industrial sewing in detail
2. Draw sewing machine and explain its parts.
3. Write in detail about folders/ attachments used in the sewing industry
4. What are the defects of sewing machine? How will you rectify them?

Answers for Objective Questions:

1.(d) 2.(d) 3.(d) 4.(c)

5.(a) 6.(c) 7.(d) 8.(a)

XI_EM_TDD_CHAP05_2022.indd 59 5/3/2022 9:50:44 AM

CHAPTER

6 CARE AND MAINTENANCE OF SEWING MACHINE

LEARNING OBJECTIVES

- To learn and understand the basics of sewing
- To gain knowledge about the various parts of sewing machine and its types
- To acquire skills in sewing machine operation
- To know the basics regarding the care and maintenance of sewing machine

6.1 INTRODUCTION

The life and performance of any equipment depends upon its care and maintenance. It stands good for both domestic and industrial sewing machines. The care and maintenance of sewing machine comprises of cleaning, oiling, and proper handling; all of which contribute to good performance, high-quality production, and worker safety.

Here are some sewing machine safety tips that one should keep in mind:

- Always inspect the machine before starting to work. Be sure it is clean and threaded correctly, with no loose threads on the pulley belt and all guards in place.
- Always practice proper posture to reduce fatigue, help prevent accidents and increase efficiency
- Do not pull your chair forward or backward while operating the machine.
- Use both hands to raise and lower the machine head.
- Always keep your head above the table.
- Keep your feet off the treadle when you are setting or threading the needle.
- Keep your attention on your work and hands.
- Keep your hands at a safe distance from the needle.
- Keep your hands, scissors, and other sharp objects away from the belt.
- Keep the machine and work station clean with tools in the side drawer.
- Wipe off any oil spilled on the floor immediately to prevent anyone from slipping. Keep aisles clear at all times.
- Do not stitch over pins or put them in your mouth.
- When the machine is not in use, lower the foot and needle

XI_EM_TDD_CHAP06_2022.indd 60 24-01-2023 13:25:40

- Turn the motor off:
  - Before cleaning, oiling or adjusting the machine.
  - Before removing or replacing the pulley belt and run the machine out. Wait until all motion has stopped
  - In case of an emergency or when in doubt.
  - Before unplugging the machine.
- Do not remove any safety devices from the machines.
- Turn off machine at the end of the work
- Scissors should be handed to another person with the handles toward the person. Never toss or throw scissors or equipment.

6.2 CARE AND MAINTENANCE OF SEWING MACHINE

It is important to take good care of sewing machine regularly. Performing routine maintenance tasks and keeping the machine clean can add years of life to the sewing machine.

Every sewing machine comes with a user's manual, which frequently includes instructions on how to clean the machine's various parts. Cleaning the sewing machine should be done step by step according to the instructions.

Here are some suggestions for sewing machine maintenance.

- **Protect the sewing machine by covering it**- Dust is a machine's worst enemy. To keep the machine as clean as possible, it should be housed in a protective case or beneath a dust cover. To avoid lint build-up in the interior, use high-quality threads.
- **Changing needles regularly**- Needles grow dull after a long period of use, which can result in looped threads, skipped stitches, fabric pulls, and possible machine damage. It is recommended that you change your needle after eight hours of use. The needles should be selected as per the fabric to prevent needle and fabric damage, (Figure 6.1)
- **Compressed air is used to remove Lint**-Each and every use demands thorough cleaning. Lint and thread can be removed from feed dogs, tension discs, and the bobbin area with compressed air.
- **Annual maintenance is required**- Every year a professional service is required to extend the life of the sewing machine. The time and tension will be adjusted, and the machine will be

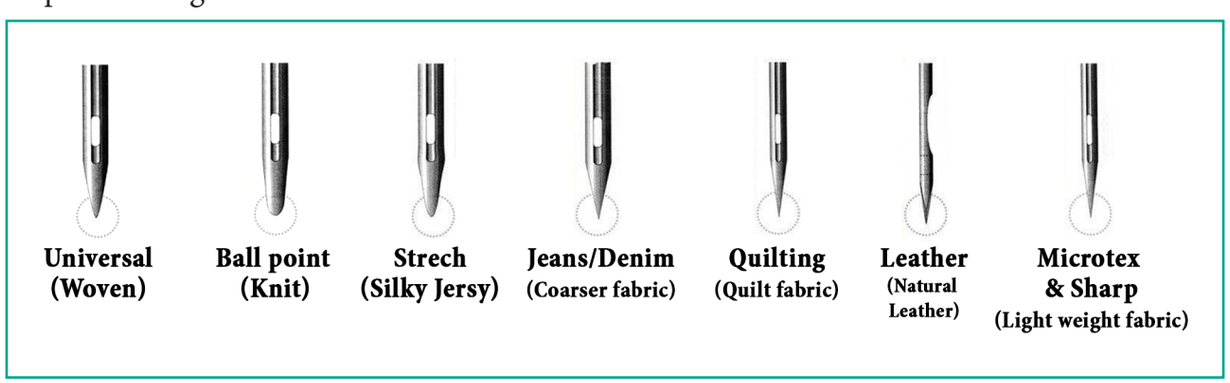


Figure 6.1

XI_EM_TDD_CHAP06_2022.indd 61 24-01-2023 13:25:40

cleaned by a skilled and experienced service worker by dismantling. Dismantling the entire mechanism. If a machine is serviced by a professional on a regular basis, its life will be substantially extended.

- **Lubricating the machine**- Oiling sewing machines on a regular basis is beneficial. Internally, sewing machines have a number of moving parts. Oiling the machine will make the parts run more smoothly and for longer periods of time.
- Machine should be cleaned one part at a time.
- After each usage, wipe the machine with a rag to keep it clean. Before wiping, make sure the machine is turned off.

6.3 CARE IN HANDLING OF TOOLS AND EQUIPMENT

- **Measuring tape** -A measuring tape is a tool that is used to measure the length and width. To ensure that the markings are accurate, the tape should be clean. The measuring tape should be coiled or wrapped after each use and stored in a clean packaging.
- **Needles for hand stitching** -To avoid rusting, hand sewing needles made of high-quality stainless steel are recommended. The needle should be kept in a dry, clean case at all times. The needle should not be pushed or poked on a hard surface to avoid damaging the needle point.
- **Threader for sewing needles** -A needle threader is a tool for swiftly and effortlessly threading a sewing needle. The eye of the needle threader should be big enough to hold the thread. The threader's metal wire has the potential to break, hence great care is needed in handling them.
- **Seam ripper** -The seam ripper should be kept sharp and neat, and it should only be used for sewing chores. When not in use, the seam ripper should be covered to prevent injury and damage.
- **Dressmakers shears** -The blades must be sharp and clean at all times. Shears should only be used to cut fabric.
- **Pressing cloth** -To preserve the garment against oil and dust, it should constantly be cleaned and kept oil-free.
- **Hams and sleeve rolls**- Always keep the hams and sleeve rolls clean from dust and oil. It should be kept covered when unused.

6.4 OILING OF SEWING MACHINE

Points to keep in mind when oiling your sewing machine

- Make sure the sewing machine is turned off before oiling.
- Oil the equipment according to the manufacturer's instructions. Every time you oil the machine, check the condition of all visible parts.
- Locate the sewing machines oil holes, usually marked by red or yellow arrows for identification. Fill each hole with one to two droplets of oil. The machine will clog if there is too much oil in it. Manually turn the hand wheel to allow the oil to flow between the components.

XI_EM_TDD_CHAP06_2022.indd 62 24-01-2023 13:25:40

- Wipe the machine and table, clear off all dust and extra oil and pick up any spilled oil right away.
- To remove any extra oil, sew on a few fabric scraps.
- After oiling the machine, wash your hands well with soap and water.
- Excess oil is a serious issue that can ruin and harm the fabric.

What oil is used in the sewing machines?

White mineral oil is used in the sewing machine, it is clear with no smell. The viscosity is light and hence it will not collect on the machine's gears.

6.5 DESCRIPTION OF DEFECTS

- **Seam Puckering** – It is the gathering of a seam either immediately or after sewing or after laundering. It results in an unsatisfactory seam appearance.
- **Open seam or broken seam** -Sewing thread has not been used to cover a portion of the garment.
- **Broken Stitch**- Non-continuous sewing thread
- **Drop stitch/Skipped stitch**- Irregular stitching along the seam
- **Uncut/ loose thread** -Extra threads or loose threads on seam line

Figure 6.2 Seam Puckering

Figure 6.3 Open seam or broken seam

Figure 6.4 Broken Stitch

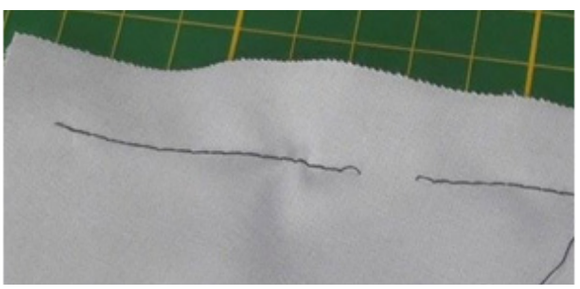


Figure 6.5 Drop Stitch/Skipped Stitch

Figure 6.6 Uncut/ loose thread

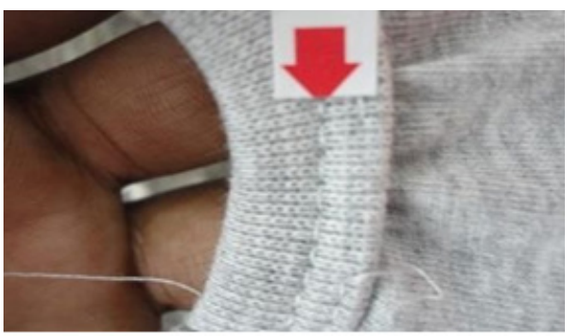


Figure 6.7 Needle thread breakage

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- **Needle thread breakage**-The thread might get stuck in the thread guide. There may be irregularities or defects in the needle guard, throat plate, bobbin case, and needle eye.

6.6 STEPS OF REPORTING TO THE RELEVANT PERSON

Safety is an important criterion to everyone. It is very essential to maintain a safe working place. To maintain a safe environment, learn the following safety rules and practice them at all times;

Safety Rules:

- When in doubt, ask the instructor.
- Report any injuries or accidents immediately to the instructor.
- Report to the instructor in case of breakage to a tool or machine.
- If the equipment does not operate properly, notify the instructor immediately.

6.7 SUMMARY

The invention of sewing machine was a boon to the development of textiles and clothing. In early days, where manual sewing was used it took hours to complete a work and was labour intensive. Today there are specific machines for each task like embroidery, button hole making, button attachment, lock stitching and bar tacking. Computerised and electric machines have made stitching easier and more comfortable. It is also important to take good care of sewing machine to extend its life and to work smoothly.

POINTS TO REMEMBER

- Care and maintenance of the machine increases the quality of sewing and life of the machine.
- The machine must be unplugged before cleaning or oiling
- Do not toss or throw sharp tools like scissors or shears
- Small lint and dust must be removed with compressed air
- While sewing, one is likely to face many problems like breaking of thread and needles. This can be avoided or corrected by suitable methods.

ACTIVITIES FOR THE TEACHER

- Show various oil holes and train how to oil them
- Teach the problems faced during sewing and how to solve them

ACTIVITIES FOR STUDENTS

- Draw a sewing machine and mark its various parts
- Sew on a fabric using various colour thread make a chart of the safety measures and paste near the sewing area

XI_EM_TDD_CHAP06_2022.indd 64 24-01-2023 13:25:40

GLOSSARY

TERM	MEANING
Pressing Cloth	Used preserve the garment against oil and dust
Dressmakers Shears	Shears with sharp blades used for cutting fabrics
Hams and Sleeve Rolls	A model roll with saw dust filling for pressing long sleeves and seams during garment construction
Seam Puckering	Gathering of a seam after sewing or after laundering
Open Seam or Broken Seam	A portion of the garment which is not covered with the sewing thread after the sewing operation.
Broken Stitch	Non-continuous sewing thread along the seam line
Drop Stitch/Skipped Stitch	Irregular stitching along the seam
Uncut/ Loose thread	Extra or loose threads hanging along the seam line after the construction of the garment

INTERNET RESOURCES

https://grandmalikestosew.com/care-sewing-machine/
machine-important-safety-rules-and-instructions

QUESTIONS AND ANSWERS

PART – I

Objective Questions:

1. For protection of the fabric from dust and oil the machine should always be cleaned with a _____.

   a. Pin cushion

   b. Gauge

   c. Pressing Cloth

   d. Ripper

YPXU9

2. The seam ripper can be preventing from damage or dust by

   a. Covering

   b. Oiling

   c. Cleaning with damp cloth

   d. Using a screw for cleaning

3. Excess oil in the sewing machine can be removed by_____.

   a. Sewing on fabric scraps

   b. Sewing on newspaper

XI_EM_TDD_CHAP06_2022.indd 65 24-01-2023 13:25:40

c. Cleaning with damp fabric

d. Cleaning with soft cotton

4. If the equipment does not operate properly, notify to the _____ immediately.

a. Department head

b. Supervisor

c. Quality checker

d. Instructor

5. The invention of sewing machine was a boon to the development of…….

a. Machine department

b. Textile department

c. Production department

d. Electic department

PART – II

Answer In Three (Or) Four Points:

1. Match the columns

Sewing machine	Care
(a) Lint in machine	1. Straight
(b) Smooth running of machine	2. Covered
(c) Method gauge	3. Compressed air
(d) Ripper	4. Regular oiling

2. How will you store hand sewing needle?

3. What are the advantages of annual servicing?

4. Mention the tip to store seam ripper.

5. List the various stitch defects.

PART – III

Answer in a Paragraph

6. Describe the cleaning of the sewing machine.

7. What is drop stitch?

8. Explain the safe handling procedure of the sewing machine.

9. Write about the care of sewing tools.

10. When will you switch off the sewing machine motor?

PART – IV

Answer in one Page:

11. Explain care and handling of sewing tools and equipment.

12. Illustrate a domestic sewing machine and name its various parts.

13. Present steps in proper oiling of sewing machine.

14. What are the common defects that occur while stitching? Write the causes and corrective actions taken for the same.

Answers for Objective Questions:

1. (c) 2. (b) 3. (a) 4. (d) 5. (b)

XI_EM_TDD_CHAP06_2022.indd 66 24-01-2023 13:25:40

CHAPTER

7

MEASURING SYSTEM

LEARNING OBJECTIVES

- To understand human body structure and proportions
- To gain knowledge about various body measurements
- To acquire skills in taking body measurements

7.1 INTRODUCTION

Body measurement can be described as the distance between one point of human body to another point. Body measurement is required to construct a garment. Garment fitting is directly related to body measurements. The fashion designing students should know how to take correct body measurements.

7.2 POINTS TO REMEMBER WHILE TAKING BODY MEASUREMENTS

- A good quality flexible measuring tape should be used.
- Measurements should be taken on correct fitted garments.
- Special care should be taken while taking measurements for kids and elders; they should stand straight without bending.
- Person for whom the body measurements are taken should stand straight.
- Select the garment to be stitched and note down the body measurement for that garment; based on fit, style and shape.
- Measurements should be taken over thin and correct fitting basic garments. Heavy garments should be avoided.
- For measuring vertical measurements, metal end of the long tape should be used.
- To measure horizontal measurements hold the tape parallel to the floor.
- While taking vertical measurements hold the tape perpendicular to the floor.
- Proper order should be maintained while recording measurements. Record crosswise measurements first and then vertical measurements.
- Measuring tape should not be tightened or loosened while taking body measurements.
- For taking circumference measurements the tape should be

XI_EM_TDD_CHAP07_2022.indd 67 5/3/2022 9:49:07 AM

passed over the required area with one or two figures in between. This will provide ease.

- Before measuring the waist, tie a cord around the waist.
- If the customer has any deviation in the body proportion of his body, note it down.
- To avoid mistakes, take measurements twice.
- Personal preference of the wearer should be asked for length, ease and style.

7.3 HUMAN BODY STRUCTURE

In order to cut and sew a fabric into any garment, one should first know the person's body shape and structure. The anatomy of the human figure is designed in a systematic manner. The height of body is divided into equal parts. This helps understanding the calculations used in pattern making.

7.4 EIGHT HEAD THOERY

A grown up human body is divided into eight equal parts,so each part is known as the '**Head**'. All these eight divisions or heads are given in Figures 7.1 and 7.2.

First Head	From hair to chin
Second Head	From chin to chest / bust
Third Head	From chest to waist
Fourth Head	From waist to hip circumference
Fifth Head	From hip to mid-thigh
Sixth Head	From thigh to below knee
Seventh Head	From knee to calf muscle
Eighth Head	From calf to tip of toe

7.5 MEASURING TECHNIQUES

Taking correct measurements is one of the most important steps in making a custom-made garment. When the body measurements are accurate, the garments will be fit. A well-fitted garment can

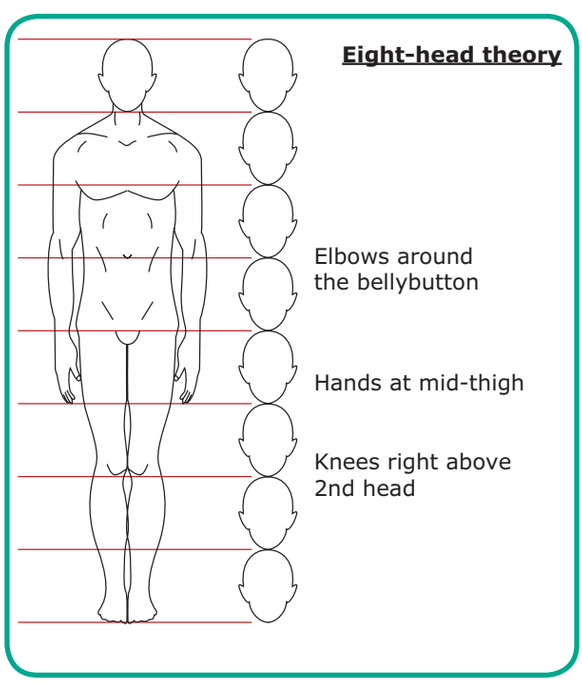

Figure 7.1 Eight-Head Men

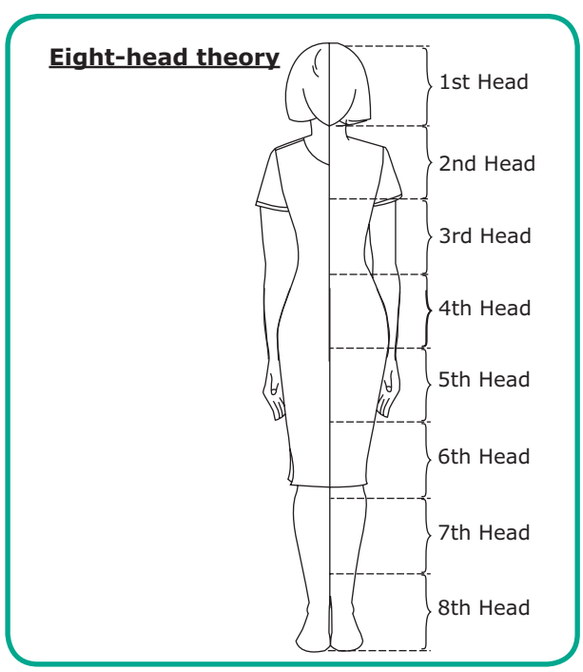

Figure 7.2 Eight-Head Women

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enhance not only the look of the person but also the personality.

Point of Measure (POM):

Specific points that is defined and used for measurement is known as **Point of Measure**. It indicates how and where the garment has to be measured.

Clothing has many points of measurement that will need to be evaluated when measuring a garment.

Examples:

Upper body: Bust/Chest, Sweep, Armhole, Cuff Opening, Neck Circumference, Across Back, Center Back, Collar Length

Lower body: Hip, Thigh, Out seam, Inseam, Crotch Piece Length, Leg Opening, Fly length

Methods of Measuring Techniques

The methods followed for taking body measurements are;

- Technique of Measuring over a Human Body
- Technique of Measuring over a Dress Form
- Technique of Measuring over a Finished Garment

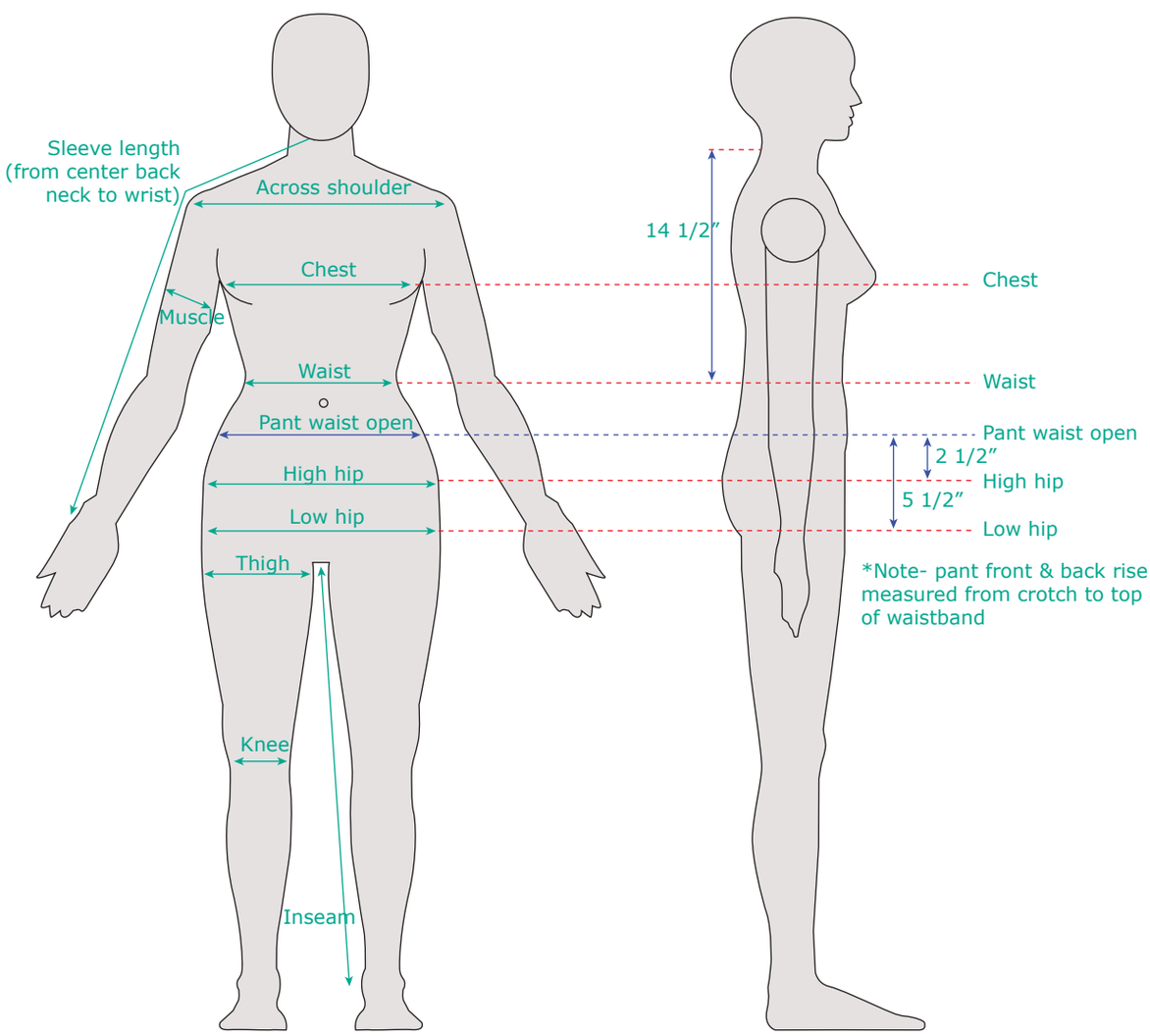

Figure 7.3a Technique of Measuring from a Human Body

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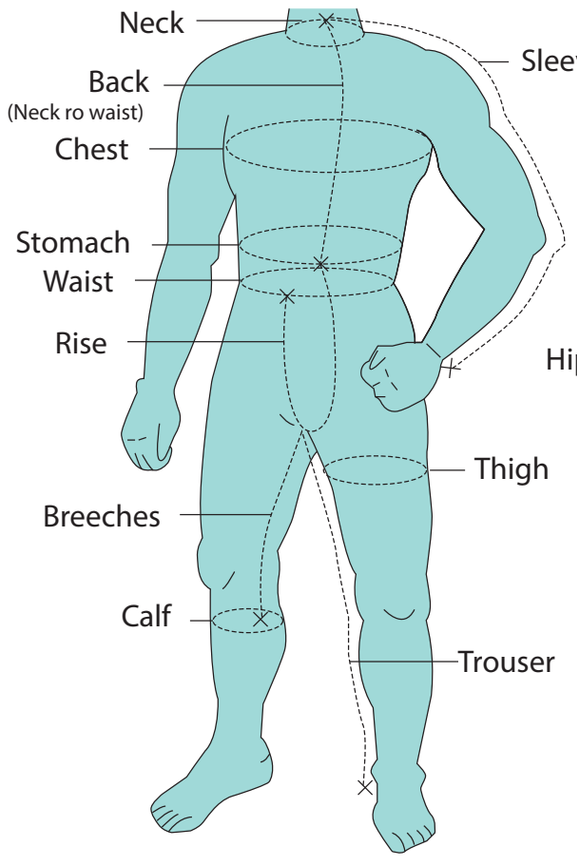

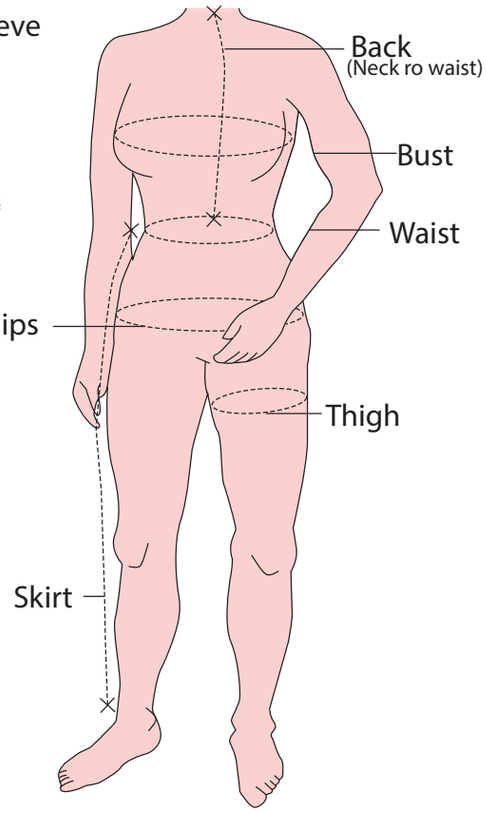

Dress / Shirt Measurement Chart

1. Neck _____
2. Over bust _____
3. Bust _____
4. Under bust _____
5. Waist _____
6. Hips _____
7. Neck to heel _____
8. Neck to above knee _____
9. Above knee to ankle _____
10. Arm length _____
11. Shoulder seam _____
12. Arm hole _____
13. Bicep _____
14. Fore arm _____
15. Wrist _____
16. V neck cut _____
17. Shoulder to waist _____
18. Waist to above knee _____
19. Navel _____
20. Thigh _____

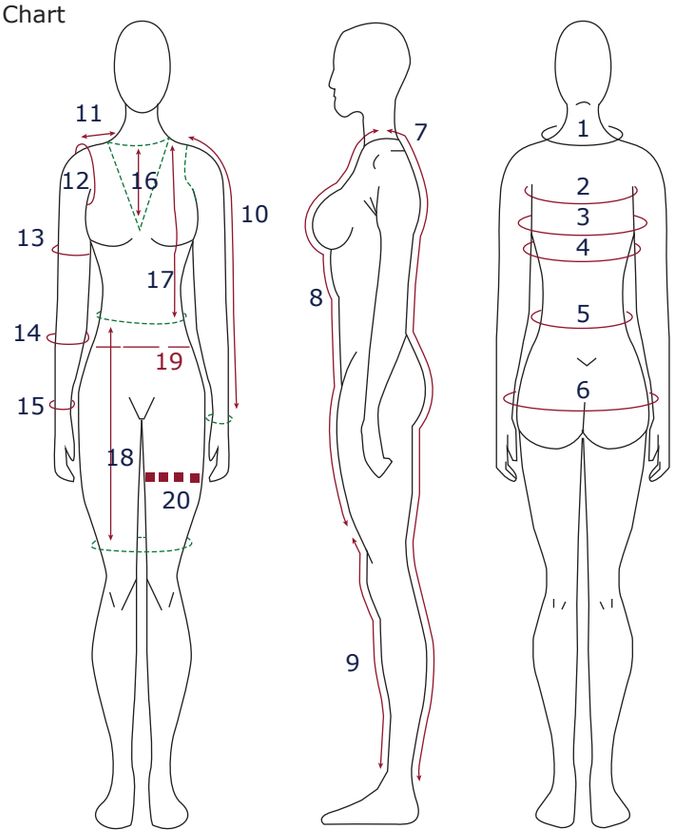

Figure 7.3b Technique of Measuring over a Human Body

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Abbreviations used in POM

CF – Center Front
CB – Center Back
HPS – High Point of Shoulder
SH – Shoulder
SM – Seam
SS – Side Seam
NCK – Neck
AH – Arm Hole
FND – Front Neck Drop
BND – Back Neck Drop
SLV – Sleeve

Tools used for Taking Measurements

- Standard Measuring tape
- Pencil/Pen to write measurement
- Paper to record measurement
- Cord to tie around the waist, bust and hip if required.

Technique of Measuring over a Human Body

These are required for stitching a garment at home or getting it stitched, and also for buying readymade garments, (Figure 7.3 a & b).

Technique of Measuring over a Dress Form

A dress form (Figure 7.4) is a three-dimensional model of an individual made to standard measurements. The dress forms serve as a basic structure to take body measurements. To get a correct fitted garment, the selected fabric is draped on the dress forms and adjustments are made. Thus we can get the look of the garment on the figure. Dress forms come in all sizes, the one in standard clothing sizes are used to make patterns, while adjustable dress forms allow garments to be tailored to fit a specific individual, (Figure 7.5).

Figure 7.4 Dress Form

Technique of Measuring over a Finished Garment (Tailor's Method)

Finished garment measuring technique has been designed to show how and where to measure. This technique helps one to take measurements for a garment from a finished garment itself, hence it is considered as the easiest method. The garment specific guideline should be followed. It is also known as Tailors method, (Figure 7.6)

Preparation for taking measurements from finished garments.

- Use a smooth and flat surface to place the garment
- Garment must be buttoned or zipped
- Garment without buttons must be overlapped as specified
- All folds, wrinkles on garment must be removed

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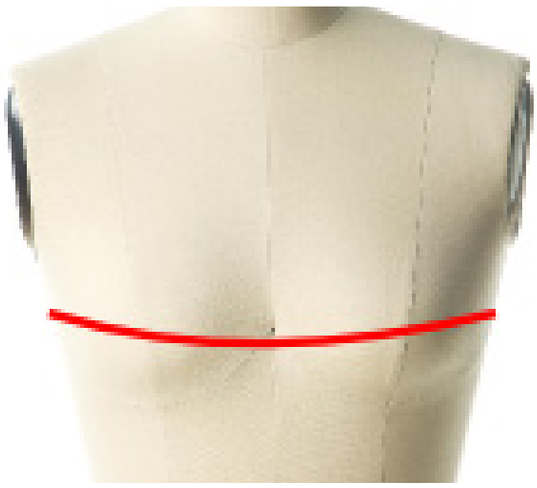
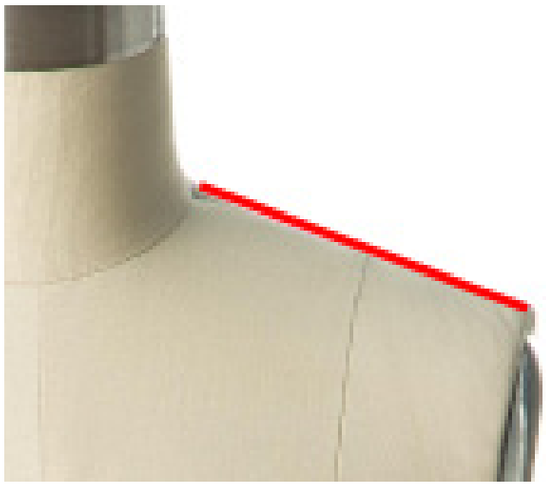


Bust

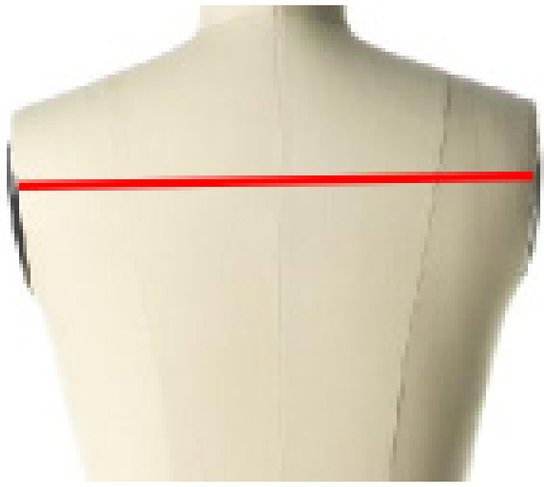
Waist

Hip

Neck



Shoulder



Back Width

Figure 7.5 Technique of Measuring over a Dress Form

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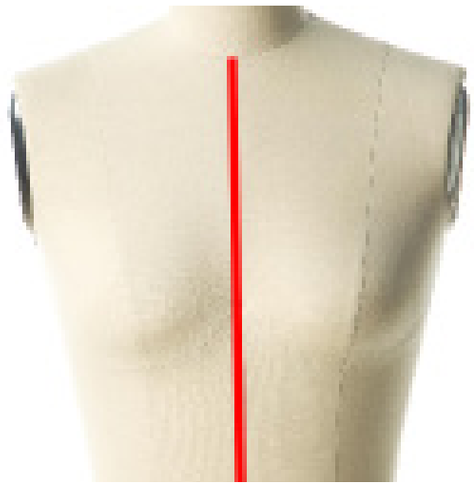
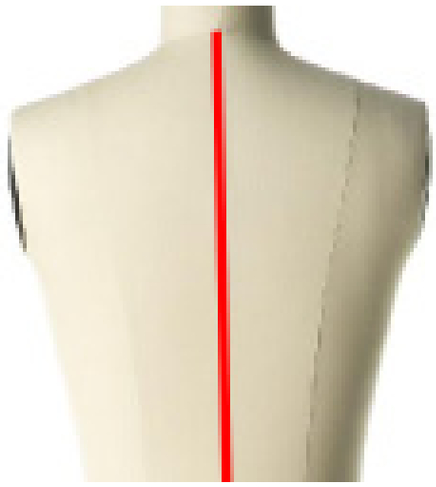
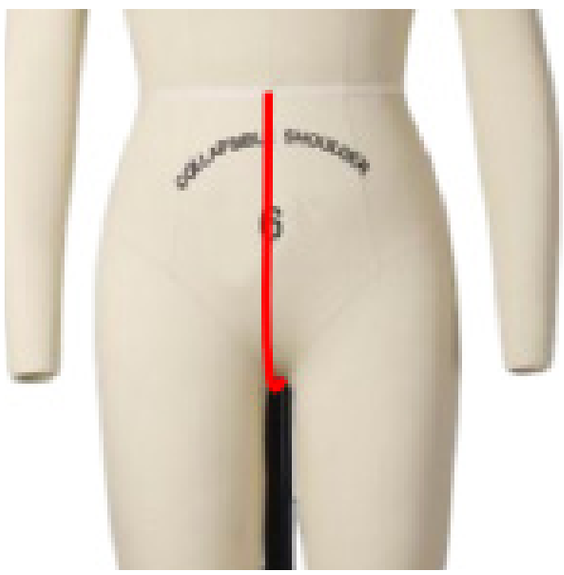


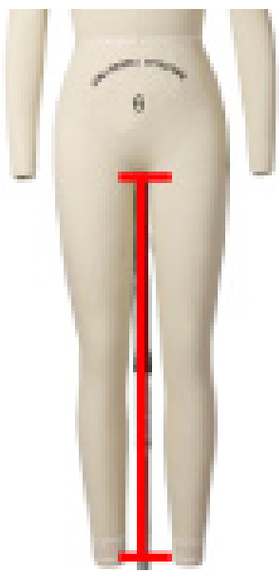
Front length



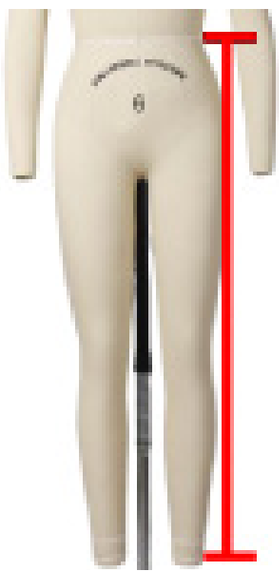
Back Length



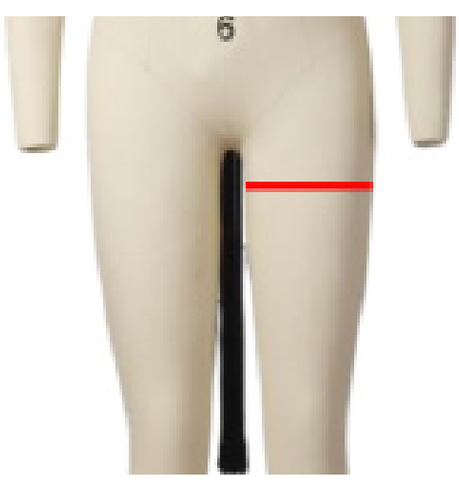
Crotch



In Seam

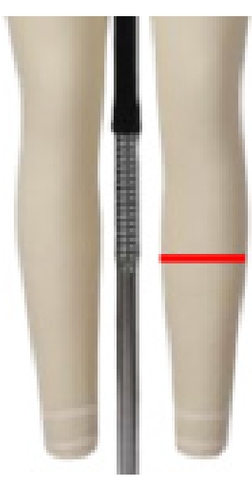


Out Seam



Thigh

Knee



Leg

Figure 7.5 Technique of Measuring over a Dress Form

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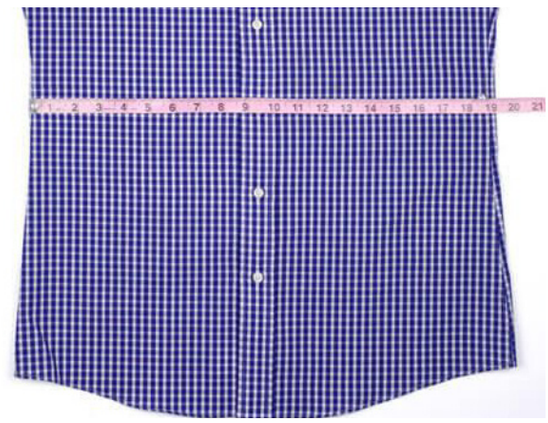
Chest



Waist

Bottom/Hem

Bicep

Shirt length

Shoulder width

Collar size

Sleeve length

Cuff Circumference

Figure 7.6 Technique of Measuring over a Finished Garment

XI_EM_TDD_CHAP07_2022.indd 74 5/3/2022 9:49:09 AM

Method of Taking Measurements

Crosswise Measurements

- **Bust Round:** Measure around the fullest part of the bust. Tape should be placed just below the shoulder blades at the back.
- **Waist Round:** Measure around the natural waist.
- **Round Hip:** Measure around fullest part of hip that is around the seat (18cm below waist)
- **Seat Round:** Measure seat round just below the hip circumference.
- **Round Neck:** Measure from front neck to the back neck around the largest part of the neck.
- **Distance between the Busts:** Measure a horizontal distance between the bust points.
- **Shoulder Width/Back width:** Measure from left to right pit of the armhole in the widest section of the back.
- **Shoulder Width:** Measure from base of the neck to armhole in the shoulder.
- **Armhole Circumference:** Measure around the underarm and armpit.
- **Upper Arm Circumference:** Measure from around the fullest part of the biceps.
- **Bicep:** Measure from bottom of sleeve attachment (2.5cm) to the top folded edge of the sleeve. Keep the tape perpendicular to the top folded edge of the sleeve
- **Elbow Circumference:** Measure around the elbow.
- **Wrist/Cuff Circumference:** Measure around the wrist. If measured from the garment, measure from the center of the button to the outside edge of the button hole.
- **Thigh:** Measure around the fullest area of the thigh.
- **Knee:** Measure around the knee cap
- **Leg:** Measure around the fullest area of the leg (calf muscle) below the knee.
- **Collar Size:** If measured from the garment, measure from the center of the button to the far edge of the button hole.

Vertical Measurements

- **Front Length:** Measure from the base of the neck to waistline along front bodice.
- **Back Length/Shirt Length:** Measure from the neck base to the centre of waist along the back bodice.
- **Shoulder to Bust Length:** Measure from the highest part of the shoulder to bust point.
- **Front Neck Depth:** Measure from the neck to the depth as per customer preference.
- **Sleeve Length:** Measure from tip of the shoulder to any point as per customer preference.
- **Waist to Seat:** Measure along the side from the waist to seat in a sitting position.
- **Waist to Knee:** Measure from the waist to center of the knee.
- **Back Hip Length:** Measure from base of neck to the hip.
- **Skirt Length:** Measure from waist as per the style of the garment. For e.g.: knee length skirt = measure from waist to knee length; Full length skirt = Measure from waist to toe length.

XI_EM_TDD_CHAP07_2022.indd 75 5/3/2022 9:49:09 AM

- **Crotch:** Measure from the center of the waist on the front down through the crotch area up to the center of the waist in the back.
- **In Seam(Inner Leg):** Measure from the bottom of the crotch (in between the legs) down through the ankle area.
- **Out Seam(Outer Leg):** Measure from the waist and the ankle area along outer leg.

7.6 SAMPLE MEASUREMENTS FOR INFANT, BOYS AND GIRLS GARMENTS

Infant Size Chart in CM and Inches

Age (M= Months &y= years)	0-3M	3-6M	6-12M	12-18M	18-24M	2-3Y	3-4Y
Length(cm)	56	68	76	86	92	98	104
Chest(cm)	41	45	49	51	53	54	55
Waist(cm)	44	46	48	50	52	54	56

Age (M= Months &y= years)	0-3M	3-6M	6-12M	12-18M	18-24M	2-3Y	3-4Y
Length(inches)	22	26.7	30	34	36.5	38.5	41
Chest(inches)	16	17.5	19	20	21	21.5	22
Waist(inches)	17.5	18	19	19.5	20.5	21.5	22

Boy's Size Chart in CM and Inches

Age (years)	4	5	6	7	8	9	10	11	12
Length(cm)	104	110	116	122	128	134	140	146	152
Chest(cm)	56	57	58	61	64	67	70	73	76
Waist(cm)	54	55	56	57.5	59	61	63	64.5	66
Seat(cm)	-	-	-	-	-	72	75	78	81
Inside leg length(cm)	-	-	-	-	-	61	63	66	69

Age (years)	4	5	6	7	8	9	10	11	12
Length(inches)	41	43.5	45.5	48	50.5	53	55	57.5	60
Chest(inches)	22	22.5	23	24	25	26.5	27.5	29	30
Waist(inches)	21	21.5	22	22.5	23	24	24.5	25.5	26
Seat(inches)	-	-	-	-	-	28.5	30	31	32
Inside leg length(inches)	-	-	-	-	-	24	25	26	27

XI_EM_TDD_CHAP07_2022.indd 76 5/3/2022 9:49:09 AM

Girls Size Chart in CM and Inches

Age (years)	4	5	6	7	8	9	10	11	12
Length(cm)	104	110	116	122	128	134	140	146	152
Chest(cm)	56	57	58	61	64	67	70	73	76
Waist(cm)	54	55	56	57.5	59	60.5	62.5	65.5	64.5
Seat(cm)	-	-	-	-	-	72	75	78.5	81

Age (years)	4	5	6	7	8	9	10	11	12
Length(inches)	41	43.5	45.5	48	50.5	53	55	57.5	60
Chest(inches)	22	22.5	23	24	25	26.5	27.5	29	30
Waist(inches)	21	21.5	22	22.5	23	23.5	23.5	24.5	25.3
Seat(inches)	-	-	-	-	-	28	29.5	31	32

7.7 SUMMARY

Accurate body measurements are the key for constructing a garment. Body measurements also help to manipulate patterns for various garments for better fit and appeal. Each body measurement is taken from a specific point to another point, which varies from individual to individual. Measurements are also taken from dress forms and finished garments. Knowledge about all the three measuring techniques aids in the construction of well fitted garments.

GLOSSARY

Body Measurement Structure	Measuring of body parts for construction of garments.
Eight Head Theory	Division of human body into 8 parts
POM	Point Of Measure
Bicep	2.5 cm below where the sleeve attaches
Inseam	Distance from the uppermost part of thigh to ankle.

INTERNET RESOURCES

https://youtu.be/psM44YcIEMg	Taking of Measurements from Dress form
https://youtu.be/ZvRTiOEt2xo	Taking of Measurements from a finished Shirt

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POINTS TO REMEMBER

- First decide the garment to be stitched.
- Note the required body measurement.
- Make the person stand straight and hold the tape properly while taking body measurements.
- Remember to keep the body measurements for future use.

ACTIVITIES FOR THE TEACHER

- Demonstrate the method of taking body measurements and record it.
- Collect and show pictures of figure irregularities and explain the method of taking body measurements for their figures.

ACTIVITIES FOR STUDENTS

- Record measurement for various age groups.

Measurement size chart for children

No.	Particulars	Measurement (cm)
1	Chest	
2	Waist	
3	Hip/Seat	
4	Shoulder	

Measurement size chart for women

No.	Particulars	Measurement (cm)
1	Chest	
2	Waist	
3	Hip/Seat	
4	Shoulder	
5	Armhole depth	

Measurement size chart for men

No.	Particulars	Measurement in cm
1	Bust	
2	Waist	
3	Hip	
4	Across back	
5	Shoulder	
6	Neck round	

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QUESTIONS AND ANSWERS

PART – I

Objective Questions:

1. Human body can be divided into _____ .

   a) 6 heads

   b) 8 heads

   c) 9 heads

   d) 5 heads

2. To avoid mistakes take measurements _____.

   a) Twice

   b) Once

   c) Thrice

   d) Four

3. Specific points that is defined and used for measurement is known as

   a) Point of Measures

   b) Vertical Measures

   c) Horizontal Measures

   d) Crosswise Measures

4. For cutting and stitching any garment one should know the persons _____.

   a) Body size

   b) Body shape

   c) Body structure

   d) Body shape and structure

PART – II

Answer In Three (Or) Four Points:

1. How will you take the bust and round hip measurement?
2. What are the tools used for taking body measurements?
3. Explain the method of taking neck round measurement.
4. List the measurements needed for a skirt.

PART – III

Answer in a Paragraph

1. Explain the factors to be considered while measuring the body.
2. What are the different measuring techniques?

PART – IV

Answer in one Page:

1. Elaborate on measuring techniques using a dress form.
2. Explain tailors method of recording body measurements.

Answers for Objective Questions:

1. **(b)** 2. **(a)** 3. **(a)** 4. **(d)**

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CHAPTER

8 PATTERNS

LEARNING OBJECTIVES

- To gain knowledge about basic patterns and different types of pattern making methods.
- To acquire skills in pattern making, methods of marking, laying and cutting fabrics.
- To understand the methods of fabric shrinkage and fabric straightening.

8.1 INTRODUCTION

Patterns are the basic structure of dresses made on paper to one's measurements or for standard body measurements. Manipulating and shaping a flat piece of fabric to match the curved figure is called "**Pattern Making**". It combines the art of dress designing and production of apparels. A correct pattern will result in good fit and comfort to the wearer. Basic patterns include bodice front, bodice back, skirt front, skirt back and sleeve patterns. These patterns can be modified to create different varieties of dresses. A clear knowledge about these concepts are required to construct a good well fitted garment. Before stitching the garment, it should be in perfect angles. Stitching fabrics to garments without pattern preparation will lead to fit issues. Example: Fit may be good in a fresh sewn garment but after one wash it will shrink in size.

8.2 BASIC PATTERN

A collection of foundation patterns usually consisting of the front and back bodice, front and back skirt and sleeve is known as the "**Basic Pattern Set**". It is drafted on paper and the dimensions are taken from a dress form, (Figure 8.1).

- Basic pattern is developed without any design features.
- It is always traced for developing variations of the given block.
- Basic blocks are altered to create a variety of new styles.
- Choosing the correct basic patterns for design development will create a good final shape for the garment.
- It also saves time during adaptation.
- It includes all the information needed for cutting and production of the garment including seam allowance.

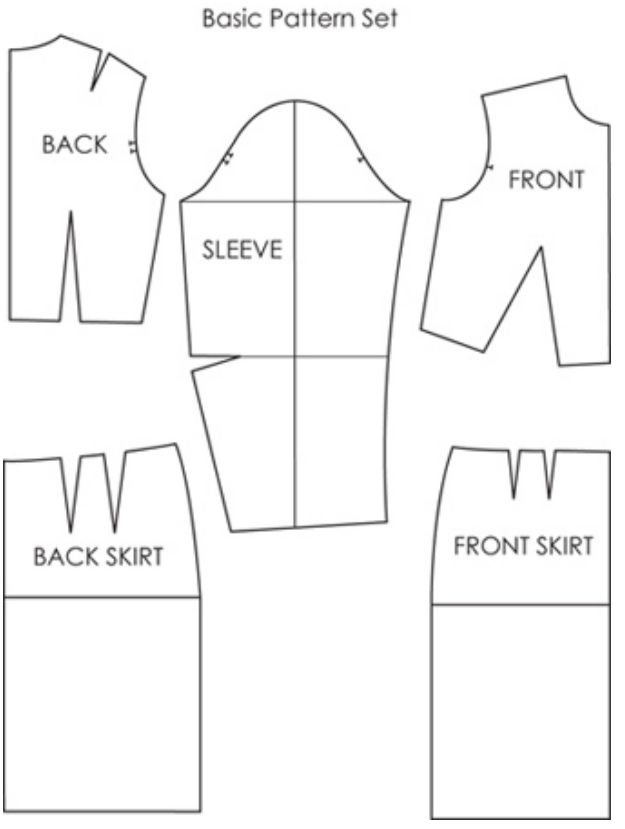


Figure 8.1 Basic Pattern

8.3 TYPES OF PATTERNS

There are different types of paper patterns namely

- Standardised paper pattern
- Individual paper pattern
- Block paper pattern
- Graded paper pattern
- Commercial paper pattern

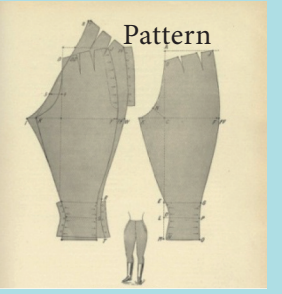
Standardised Paper Pattern

The standardised paper pattern is prepared using standard body measurements. This will suit a group of people with the specific chest measurements. This method is followed in training and tailoring schools, (Figure 8.2).

DO YOU KNOW?

How were patterns made before the invention of paper patterns?

Sized patterns didn't even exist before 1863. Women used to disassemble old clothing and use them as guides to create new clothing, and only few patterns came in one size.



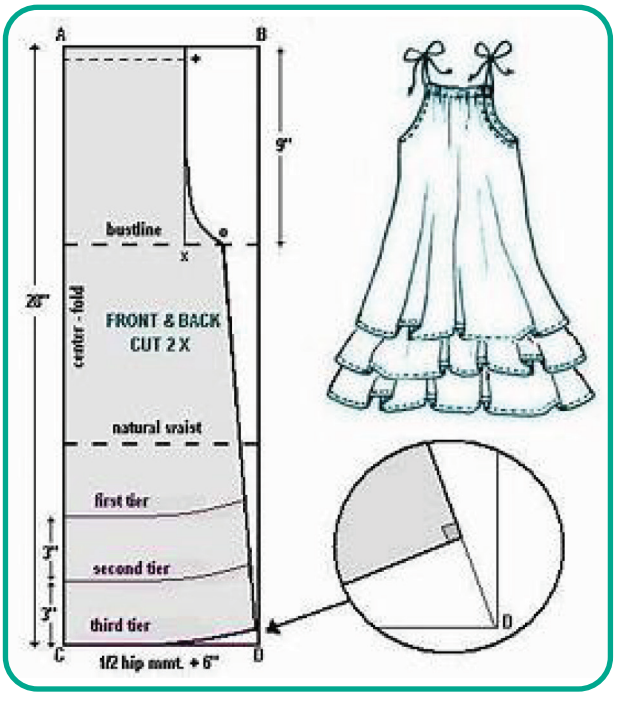


Figure 8.2 Standardized Paper Pattern for Frock

Individual Paper Pattern

Individual paper patterns are prepared using measurements of a particular person. It is done at home and some tailor shops. It is used to produce customized dresses, (Figure 8.3).

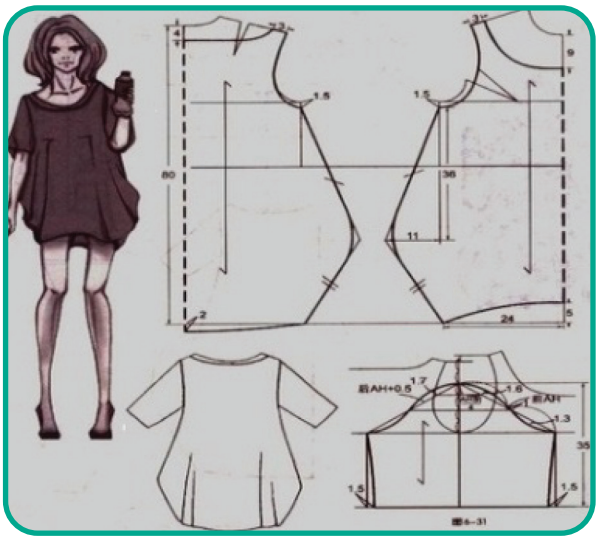


Figure 8.3 Individual Paper Pattern for Girl's Frock

Block Paper Pattern

Block paper patterns are prepared with thick cardboards of the standardized body measurements. These patterns are mostly used in the garment industry to cut bulk amount of garment in less time. These patterns are stored for further use also, (Figure 8.4).

Figure 8.4 Block Paper Pattern

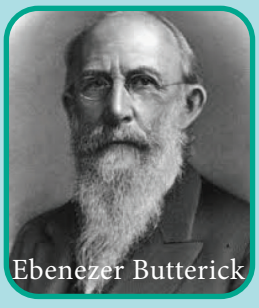
Graded Paper Pattern

Graded paper patterns are prepared for five consecutive sizes (Example : 100, 110, 120, 130, 140 cm measurements) in one single pattern. The required size is traced and cut from this pattern sheet and used. These paper patterns help one to increase or decrease a paper pattern. These patterns are very useful for designers, (Figure 8.5).

Commercial Paper Pattern

Commercial paper patterns are the readymade patterns, available in shops for all body measurements. These come with instruction manuals and step by step guidelines about selection of fabric, preparation of fabric, marking, cutting and steps for sewing. Butter paper or tracing papers are used for the preparation of commercial paper patterns. Garment variation is also seen in some commercial patterns. The patterns are placed in envelopes with pictures of the garments on models and fabric combination in which the garment will look good, (Figure 8.6).

DO YOU KNOW? Who made the first Commercial Paper pattern?


Ebenezer Butterick

Ebenezer Butterick was an American tailor. Along with his wife Ellen Augusta Pollard Butterick, prepared the first tissue paper dress patterns with grading for multiple standard sizes. They started marketing it from 1863. The product was a revolution in home sewing.

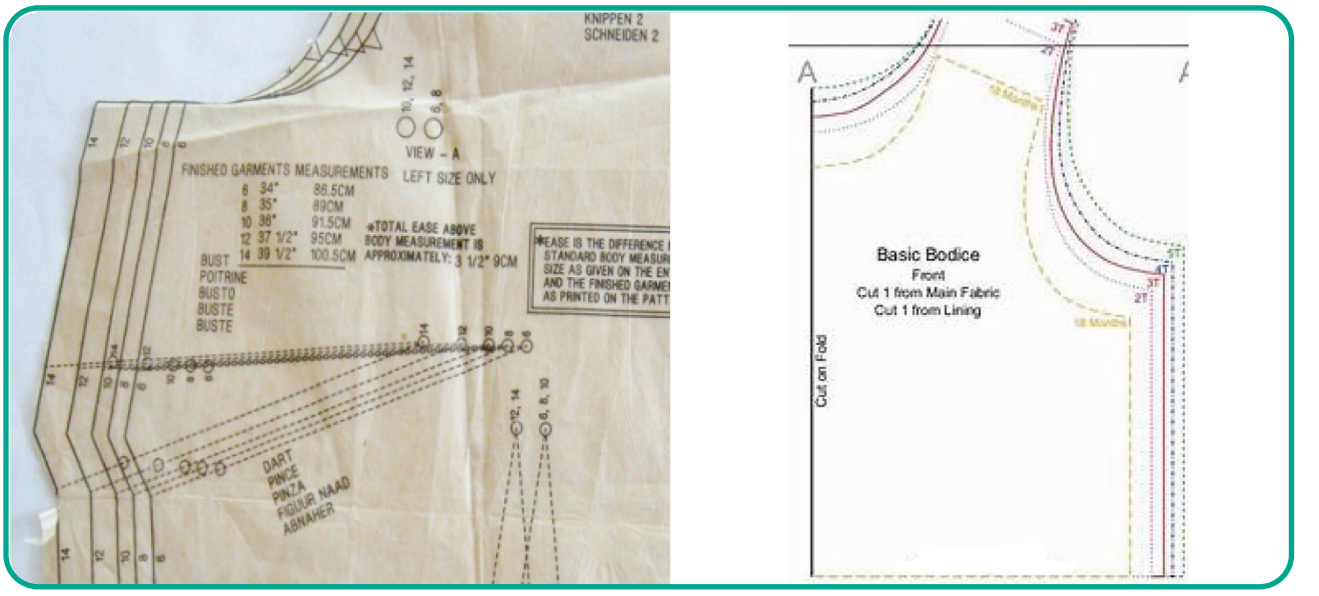


Figure 8.5 Graded Paper Pattern

Figure 8.6 Commercial Paper Pattern

Envelope of Commercial Pattern

8.4 INDUSTRIAL PATTERNS

Industrial pattern making is a blueprint for making readymade garment. It has all the components of garments and instructions are marked on the pattern like Name of pattern, Pattern size, Style number, Number of pattern pieces, Seam allowances, Construction lines, Grain lines, Fold line, Balance marks, Centre front and Centre back.

Types of Patterns used in Apparel Industry

- **Basic Block** – A pattern of garment without any style or design. It can be made by modeling or flat pattern methods

- **Working Pattern or Apparel Pattern or Production Ready Pattern** - A pattern drawn on boards or hard paper with addition of sewing allowances, trimmings and fullness
- **Production Pattern** -A basic pattern with all pattern details marked
- **Nested Pattern** – This pattern is used to check the sizes of garments like XS, S, M, L, XL
- **Marking Pattern** –This pattern is used to mark a particular area in the basic pattern. E.g.: a point where an embroidery or logo has to be incorporated in a garment.
- **Garment Pattern** - This pattern is used to cut the original sample of any garment. It can be made through modeling or flat pattern methods

8.5 METHODS OF PATTERN MAKING

Pattern making is an art to learn and should be followed carefully. Pattern can be made by three main methods namely;

- Drafting method
- Draping method
- Commercial patterns

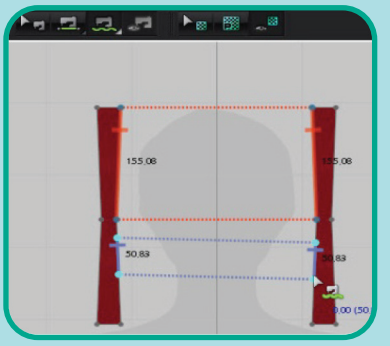
Drafting

Drafting is the system of drawing patterns on paper with mechanical precision on the basis of body measurements. A basic pattern should have a minimum number of darts and should fit the body comfortably without being tight or loose. Drafting can be done on ordinary brown paper which is not too thin. It can be done on thicker paper to be preserved for future use. Sometimes this is made on card board and used for many years. A sharp pencil, ruler, 'L' scale or set squares are needed to make a pattern with straight lines and smooth curves. The following fundamental principles should be understood before starting to attempt drafting. This method is easy but requires some calculation. Drafting has a set of instructions like "Draw a line AB measuring half waist round" which has to be followed to get the paper pattern, (Figure 8.7).

Figure 8.7 Drafting Method

What is Cloth Simulation Software?

Cloth simulation software's can draft patterns on the computer and visualize clothing designs by using the pattern creation tools and virtual sewing machines.



View of Cloth Simulation Software

Important Points to Remember while Drafting Patterns

- Patterns should be made larger than the body size by adding ease allowance to the actual measurement. This gives the garment freedom of movement, ease, and comfort in wearing. Normally 5 cm allowance is given around the chest and 1 to 2.5 cm for other measurements.
- For identical designs where the right and left side of the garment is same, only one side is needed to be made in paper. It can be reserved and copied for the opposite side.
- It is better to draft the basic pattern block first then while cutting, seam allowances should be added to the pattern and markings should be made on the fabric.

The following construction information should be recorded and marked clearly, (Figure 8.8).

a) Name of each piece of pattern.

b) Number of pieces to be cut with each pattern piece.

c) If seam allowance is included in the draft, seam lines and cutting lines should be clearly shown using blue and red pencil respectively.

d) Straight grain or lengthwise line should be drawn on all patterns with a red pencil as shown (← — →). This line indicates the direction in which the pattern has to be kept on the cloth so that it is parallel to the selvedge.

e) Matching notches or balance marks should be provided along seams to show which seams are to be joined together.

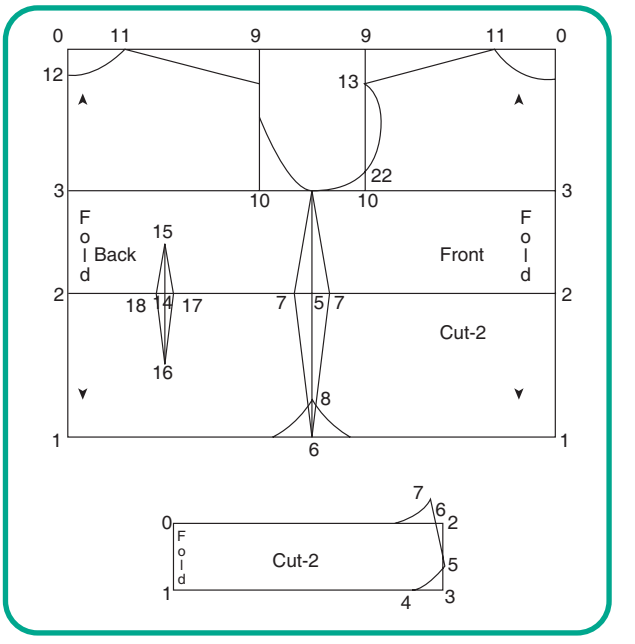


Figure 8.8 **Drafted Pattern**

f) It is advantageous to cut outward notches at centre front and centre back of pattern pieces as it helps at the time of assembling the garment and stitching collars.

g) Folding lines, dart marking, pleat markings etc. should be clearly shown.

h) Drafting technique can be mastered carefully by following the instruction and drawing the patterns in a systematic manner.

Draping

Toils and modeling are another common terms used to describe draping. Draping is the manipulation of fabric on a three dimensional form by a designer to obtain perfect fit and harmony between the fabrics and design of the garment and the silhouette of the individual. The material is modeled around a dress stand or human body to see the fit. It is checked, marked and then cut and finally stitched. There are several types of dress forms available

in the market but the most commonly used ones are:

- Adhesive Paper Dress Form
- Muslin Padded Dress Form
- Paper Mache or Plastic Molded Dress Forms

Adhesive Paper Dress Form

Adhesive paper dress forms are prepared for individual body measurements by pasting adhesive tapes over a correct fitting garment (vest) worn by the individual. The centre front, back, neck armscye, waist and hip lines are marked. The adhesive form is cut through carefully without hurting the individual and rejoined and the edges are finished neatly with help of adhesive tapes. The dress form should be allowed to dry completely before use, (Figure 8.9).

Figure 8.9 Adhesive Paper Dress Form

Muslin Padded Dress Form

Muslin padded dress forms are similar to adhesive paper dress forms but they are made with muslin materials. The inner side of the dress form is padded, hence it is stiffer. Padding helps to increase the usage and life of the dress form. This can be placed on a stand while draping and preparing the paper patterns. Later it is covered with a neat fabric and used when needed, (Figure 8.10).

Figure 8.10 Muslin Padded Dress Form

Paper Mache or Plastic Molded Dress Forms

Paper mache or plastic molded dress forms are commercially made and sold for standard sizes. Even separate hand, leg dress forms are available. It is costly but can be used for many years. These dress forms will not suit individual with figure irregularities, (Figure 8.11).

Figure 8.11 Paper Mache or Plastic Molded Dress Forms

Draping Method

The method of preparing a pattern following draping method is discussed below, (Figure 8.12);

Figure 8.12 Method of Draping

- Place the dress form on to a stand or table and ensure it is steady.
- Select the fabric, which has to be cut and stitched. Drape the fabric on the individual, look of design and colour to match the individual's structure and complexion.
- Beginners can first drape with fabric which is of similar texture and weight to the fabric, which is to be cut and sewn.
- Drape the fabric on the dress form allow it to fall naturally. Check the grain of the fabric (lengthwise grain should match the centre front line). A number of experimental folds have to be made. Check for best design and drape. Pin the extra fabric. Do not cut.
- Ensure the design and drape once again, so as to avoid cutting on wrong size or designs.
- Draping should be done on a continuous line to give the best effect. This is possible only through practice. Hence before finalizing the design and pattern try draping in a number of ways.
- Special care should be taken in case of checks and stripes. These fabrics can be draped on cross grain also for creating design variation, especially for yoke or collar.
- To decide on fullness, try 2 to 3 styles. Example, pin tucks, box pleats and gathers can be draped on the dress form and the best can be selected.
- Once the design of the garment is finalized, pin the fabric on the dress form, match the centre front, back, shoulder, chest round lines in the dress form. Pin along the line.
- Move the fingers slowly and make the dart and fullness needed and pin it. Care should be taken to maintain grain.
- Mark the line, cut and keep the pieces ready for sewing.
- Name the pieces to avoid confusion. Fold the piece and keep them in a neat cover, if stitching is not being done immediately.
- For identical design one side can be draped, marked and cut. The reverse of the cut patterns can be used for preparing the pattern for the other side.
- Care should be taken to use minimum or fine pins especially for delicate fabrics like silk.
- Based upon the type of design, dart can be converted to create fullness.
- Place weights or tape while draping design which requires more quantity of fabric. Examples: Wide neckline or

side panels which are cut and gathered. Since the fabric drops down, weights can be placed inside these drapes or tapes should be used.

- Trimming, buttons and other accessories can be placed on draped fabrics to check its suitability with the fabric.

In spite of the cost, the method helps one to view the look of the finished garment; hence, correction can be made even before cutting the patterns. It also involves more time and practices.

Commercial Patterns

Commercial patterns were first developed in U.S.A. in 1950's. Later patterns were developed for all age groups of both sexes. Commercial paper is made out of tissue / butter papers for standard body measurements. Generally these patterns are marked for 5 sizes and packed in an envelope. Commercial patterns are produced by companies and sold. It is very popular in foreign countries. The pattern names, number of pieces to be cut, grain, notches, cutting lines, stitching lines, darts and fullness are also marked. On the cover, a picture of the dress is shown. The size, cutting and sewing instructions are also mentioned. The body measurements are mentioned on the cover. This helps one to select the correct size. Dress modifications are given by some companies. The materials required like buttons and accessories are also printed on the cover.

The major advantages of commercial patterns are good designs and simple instructions. The pattern will have good fit when compared to other patterns but will need modification in case of irregular body structures. In India, commercial patterns are not popular.

8.6 ADVANTAGES OF PAPER PATTERNS

- A correct pattern will result in good fit.
- A pattern prepared on thick paper or card board can be preserved and re-used for a long time.
- Basic patterns can be modified to produce patterns for complicated designs. (Example: the basic bodice front pattern can be modified for a bodice with yoke design).
- A paper pattern can be used to make new patterns of the same design by enlarging or reducing the size of the paper pattern. This is done by a scientific method called "**Grading**".
- It is easier and quicker to cut using a paper pattern than drafting straight on the fabric.
- A paper pattern enables us to cut a garment with a minimum amount fabric. One can find out the most economical way of cutting the fabric by placing the paper pattern on top and trying different ways (Layouts).
- Drafting mistakes can be corrected in the pattern itself.
- Patterns can be modified according to the recent trends in clothing.

8.7 PATTERN LAYOUT AND ITS TYPES

The placement of pattern on the fabric, in an economical manner, that is without wasting fabric is known as **Pattern Layout** . All the patterns should be arranged properly following grain of the fabric. Example: the bodice centre front will be in straight (lengthwise direction) grain.

The main points to be considered while laying patterns are:

- Press the fabric without any wrinkles before laying the patterns.
- Place the fabric on a large or a hard flat surface, which is easy for work.
- Place the larger patterns first. Place smaller pattern together, with same length. Example: placement of bodice front and bodice back next to each other, such that the side seams are close to each other.
- Place the smaller patterns in gaps in between the larger pattern.
- Placement of similar patterns will help economical use of fabric. This is known as **"Dove Tailing".**
- If pattern is to be cut in more number, place them on fold. This concept is not possible when the fabric has a one way design or when the patterns have different front and back patterns.
- Keep weight, pencil, pins ready in hand, to draw, or pin or place weights on patterns, so that it remains in correct position.

Types of Pattern Layouts

Based upon the placement of the patterns, the layouts are classified (Figure 8.13) as follows;

- Open layout
- Lengthwise centre fold
- Off-centre length wise fold
- Crosswise centre fold
- Off centre crosswise fold
- Double fold or combination fold

Open Layout

Open layout is the simplest layout. The fabric is spread on the table and the patterns are laid from left to right one after the other. This is easy for beginners. No fold is made in this method. It can be used for all patterns. This is used especially for designs with different left and right patterns.

Lengthwise Centre Fold

The fabric is folded in the lengthwise direction. The selvedges of both sides are placed one on top of the other and folded in the middle. The fabric forms a fold at the centre. All folded patterns are placed along this fold. This fold is also used for different type of frocks, shirts and blouses.

Off-Centre Lengthwise Fold

The required width needed for the patterns is taken on the fabric and folded in the lengthwise direction. This is commonly seen when many small patterns are found in garments. The fold should be parallel to the selvedge. This is used for many garments from simple baby's panty to integrated men's coats.

Crosswise Centre Fold

Crosswise centre fold is similar to lengthwise centre fold. In this fold, the fabric is folded in crosswise direction. It is best suited, when the patterns are too narrow to be fitted in the lengthwise fold. This fold can also be used when special effects are needed like having a dress with horizontal stripes using a material with lengthwise stripes.

Off Centre Crosswise Fold

The off centre crosswise fold is a layout when the fabric is folded in the cross grain. The fold is perpendicular to the selvedge. This fold is used when a part of garment is cut in cross wise grain for ease or special effects. Example: when collars or yokes are cut on fabrics with horizontal stripes or vertical stripes.

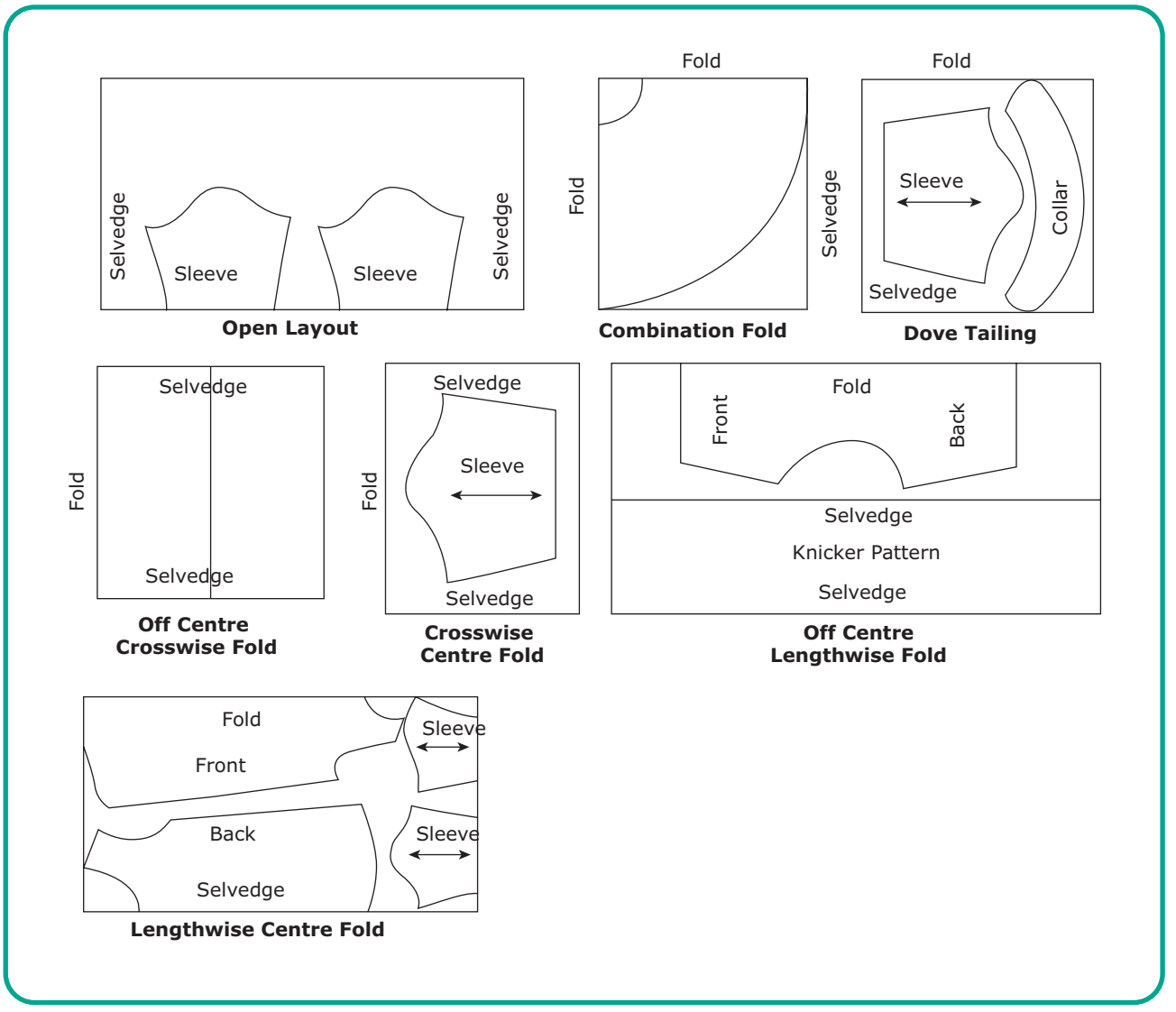


Figure 8.13 Different Types of Layout

Double Fold or Combination Fold

In combination fold the fabric is folded in lengthwise and crosswise grains together. This layout is used for sari petticoats and jablas (Figure 8.13).

8.8 FABRIC PREPARATION FOR SEWING

The warp yarns are starched to avoid breakage during weaving, Other finishes are also given to the finished fabrics to increase the market value, which must be removed before stitching. Removal of these substances is known as "**Fabric Preparation for Sewing**". If fabric is not prepared well, yarns may be reallocated and shape of the garment may change. So, it is necessary to prepare the fabric before marking and cutting it. There are different steps in fabric preparation. It varies depending upon the type of fabric used. The most important steps are shrinkage and straightening of fabric.

8.9 SHRINKAGE

Shrinkage is described as the reduction in length and width of the cloth when washed. If a garment shrinks, it will ruin the fit.

Therefore all fabric should be subjected to shrinking before cutting and sewing. Shrinkage can be carried out in different methods. They also vary from fabric to fabric.

Shrinkage of Fabric without Water

The fabric should be placed on the table with face side lying down for the shrinkage. A wet cloth or towel should be kept between the two fabrics and iron with warm heat. While ironing, the wet cloth that is present in between will give air due to heat and help in the shrinking of the fabrics. Then ironing must be done in all places.

For woolen fabric, the wet cloth must be kept in between the fabrics for one night. After that, the cloth that was kept above the wool fabric should be removed. The woolen fabric should be spread on the wrong side facing upward. Ironing should be done by keeping the fabric above the wool fabric and it should be left to dry naturally. This process should be done two times.

Shrinkage of Fabric with Water

The fabric to shrink should be kept in the soap solutions for four hours. In case of cotton fabric hot water is needed. The fabric should be stirred from time to time. After that, it should be rinsed for 3-4 times and dried by hanging in the lengthwise direction. While drying the cloth, avoid using steel rods and use thread ropes. Ironing must be done while the fabric is slightly wet. In case of coloured cloth they must be soaked separately and washed.

8.10 FABRIC STRAIGHTENING

Fabric undergoes tension while weaving, knitting, dyeing or printing. During these processes the position of the yarns can change resulting imbalance of the fabric. If a garment is cut and stitched when the yarns are not straight, then the drape of the garment will not be correct. Therefore it is important to ensure the correct placement of the yarn before cutting. This process of placing the misplaced yarns in the correct position is known as straightening of fabric. The yarns must interlace at right angles.

Place the fabric on a long table and remove the creases by pressing firmly with your fingers. Fold the fabric in the lengthwise direction. If the two selvedges meet evenly and is parallel to the edge of the table then the fabric is straight. If not, straighten the fabric by pulling the fabric in the opposite direction until the selvedges meet each other evenly.

8.11 SUMMARY

Patterns are the foundation for dress designing. Patterns can be made by drafting or draping methods. Commercial patterns are also available. Each of these methods has their own merits and demerits but can be used for designing all types of dresses irrespective of age and sex. Mastering pattern making will make one to become a good designer.

One of the most important aspects in good dress designing is preparation of fabric for sewing. This includes concepts like shrinkage and fabric straightening. Economical layout can be obtained through trials and practice.

POINTS TO REMEMBER

- Drafting is a mechanical process of making patterns using measuring and drawing tools.
- Drafting involves calculation and the three dimensional dress is represented on paper as a two dimensional structure.
- Draping is the method of making patterns on dress form or individual using muslin or selected fabrics.
- Draping involves practice and patience.
- Commercial patterns are ready to use paper patterns prepared by experts, printed and sold in markets by different companies.

ACTIVITIES FOR THE TEACHER

- Demonstrate the drafting technique and prepare a basic bodice front back, sleeve and skirt front and back patterns.
- Demonstrate the method of making a bodice front pattern using draping techniques.

ACTIVITIES FOR STUDENTS

- Prepare basic bodice front, back, skirt front, back and sleeve patterns using drafting method of pattern making.

GLOSSARY

1.	Marking Pattern	Used to mark a particular area in the basic pattern
2.	Draping	Arrange loosely or casually on or round something.
3.	Muslin	Plain weave light weight cotton cloth.
4.	Commercial patterns	They are full scale tissue paper clothing patterns used by the home-sewer to create garments.
5.	Shrinkage	Reduction in the width and length of a fabric

INTERNET RESOURCES

https://www.youtube.com/watch?v=QfMu0lCTvPw	Basic Bodice Block Pattern
https://www.youtube.com/watch?v=EdJSUd71CdI&t=68s	Flat Pattern Drafting, the Bodice Block

QUESTIONS AND ANSWERS

PART – I
Objective Questions:

1. Patterns should be made larger than the body size by adding _____ to the actual measurement.

   (a) Extra allowance

   (b) Two cm

   (c) Grading Measurement

   (d) Ease Allowance

2. A pattern prepared on _____ can be preserved and re-used for a long time.

   (a) Chart Paper

   (b) Brown Paper

   (c) Card board

   (d) News Paper

3. The standardised paper pattern is prepared and followed by _____.

   (a) Tailors

   (b) Tailoring school teachers

   (c) Readymade sewing units

   (d) Students

4. Direction of the selvedge is in the _____ direction

   (a) Lengthwise

   (b) Crosswise

   (c) Diagonal

   (d) Bias

5. Straightening the fabric should be carried out _____

   (a) Before stitching

   (b) After stitching

   (c) Before cutting

   (d) After cutting

6. Spreading method which is not used for folding the fabrics.

   (a) Combination fold

   (b) Open layout

   (c) Lengthwise fold

   (d) Lengthwise Layout

7. Folding fabric in lengthwise and crosswise direction is called as _____.

   (a) Combination fold

   (b) Off center crosswise fold

   (c) Lengthwise layout

   (d) Open layout

8. Method used for preventing the wastage of fabric is known as _____.

(a) Draping

(b) Grading

(c) Layout

(d) Drafting

PART – II

Answer In Three (Or) Four Points:

1. What is standardised paper pattern?
2. Define basic pattern.
3. What is fabric shrinkage?
4. List the advantages of open layout.
5. Write about Commercial patterns.

PART – III

Answer in a Paragraph

1. Mention the differences between drafting and draping.
2. What are the advantages of paper patterns?
3. Explain fabric straightening?
4. How will you straighten a fabric without water?

PART – IV

Answer in one Page:

1. Define pattern and explain different types of patterns.
2. Describe the types of layout in detail with diagram.

Answers for Objective Questions:

1. **(d)** 2. **(c)** 3. **(a)** 4. **(a)**
5. **(c)** 6. **(b)** **7. (a)** **8. (c)**

CHAPTER

9

SEWING TERMINOLOGY AND STITCHES

LEARNING OBJECTIVES

- To learn various sewing terminologies used in garment industry.
- To gain knowledge about the various types of basic stitches and embroidery stitches.

9.1 INTRODUCTION

In garment industry various sewing terminologies are used for perfect construction of garment. Basic stitches are the fundamental stitches which have to be learnt before doing actual sewing. Familiarity with these terms will build confidence in the person sewing. It is necessary to learn basic stitches to do temporary and permanent stitching. Basic stitches are used as embroidery, decorative gatherings, placket openings, necklines and hemlines.

9.2 SEWING TERMINOLOGY

The following sewing terminologies are used in the garment industry.

Grain

For woven textiles, grain refers to the orientation of the weft and warp threads. There are three 3 types of grain namely on grain, off grain and bias, (Figure 9.1).

Importance of Grain line

When the grain is not in the appropriate angle steps are taken to make it straight.

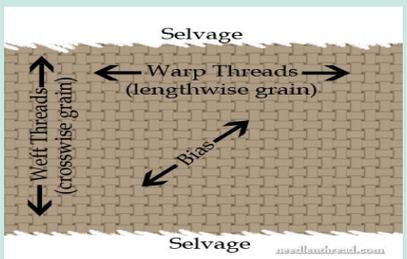
On Grain	Off Grain	Bias	
Oriented parallel with the warp threads and the selvedge	Runs perpendicular to the selvedge and parallel to the weft threads	Grain is at 45 degrees to its warp and weft threads	

Figure 9.1 Grain Lines

XI_EM_TDD_CHAP09_2022.indd 95 24-01-2023 13:28:38

Moreover, the grain enhances the drape of any garment. For example, the choli front bodice is cut on diagonal grain for better drape and flexibility.

Selvedge

Selvedges are thicker, closely woven finished lengthwise edges of a fabric. They are usually 0.5 to 1.5 cm broad. Selvedges prevent the fabric from ravelling. It is strong with more number of warp yarns, (Figure 9.2).

Figure 9.2 Selvedge

Stitch Length

It is a distance between two consecutive punches of a needle in one step sewn by a sewing machine. It is usually expressed in millimeters, and ranges from 0 to 6 or 7 on most machines, (Figure 9.3).

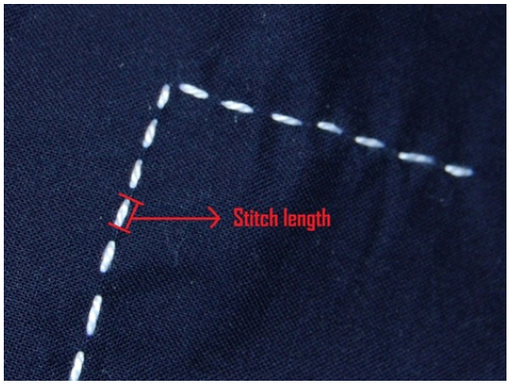


Figure 9.3 Stitch Length

Stitch Line

The line where the fabric pieces will be stitched together. When matching pattern parts or making pattern adjustments, it is essential to match or adjust the sewing line, not the cutting edge. The stitching line is usually 0.5cm to 1.5cm from the cut edge, (Figure 9.4).

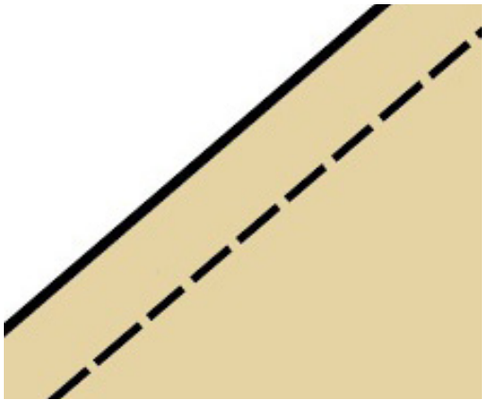


Figure 9.4 Stitch Line

Stitch Density

The number of stitches per unit leanth is called as Stitch density. Stich density requirement may be varied according to the type of fabric and the required seam streanth.

Basting

The basting stitch, also known as tacking, is a long running stitch that is mostly used to keep two or more layers of cloth together temporarily until they can be properly sewn with a permanent stitch, (Figure 9.5).

Figure 9.5 Basting

Hems

The edge of a piece of cloth is folded and sewn to prevent unravelling of the fabric

XI_EM_TDD_CHAP09_2022.indd 96 24-01-2023 13:28:38

and to adjust the length of the piece in garments, such as at the end of the sleeve or the bottom of the garment.

Notches

Sewing notches are the little triangles or markings on sewing pattern that helps to match up garment panel pieces, (Figure 9.6)

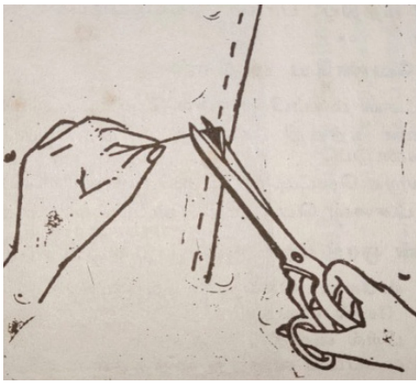


Figure 9.6 Notches

Seam Allowance

Seam allowance is the area between the fabric edge (cutting line) and the stitching line.

Seam allowance can range from 0.25cm wide to as much as several cms depending upon type of fabric and style of the garment,(Figure 9.7).

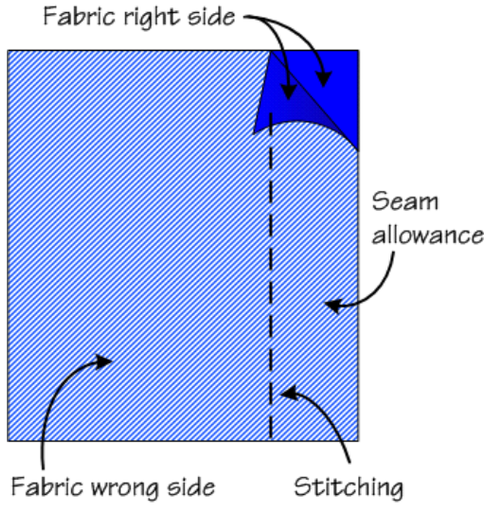
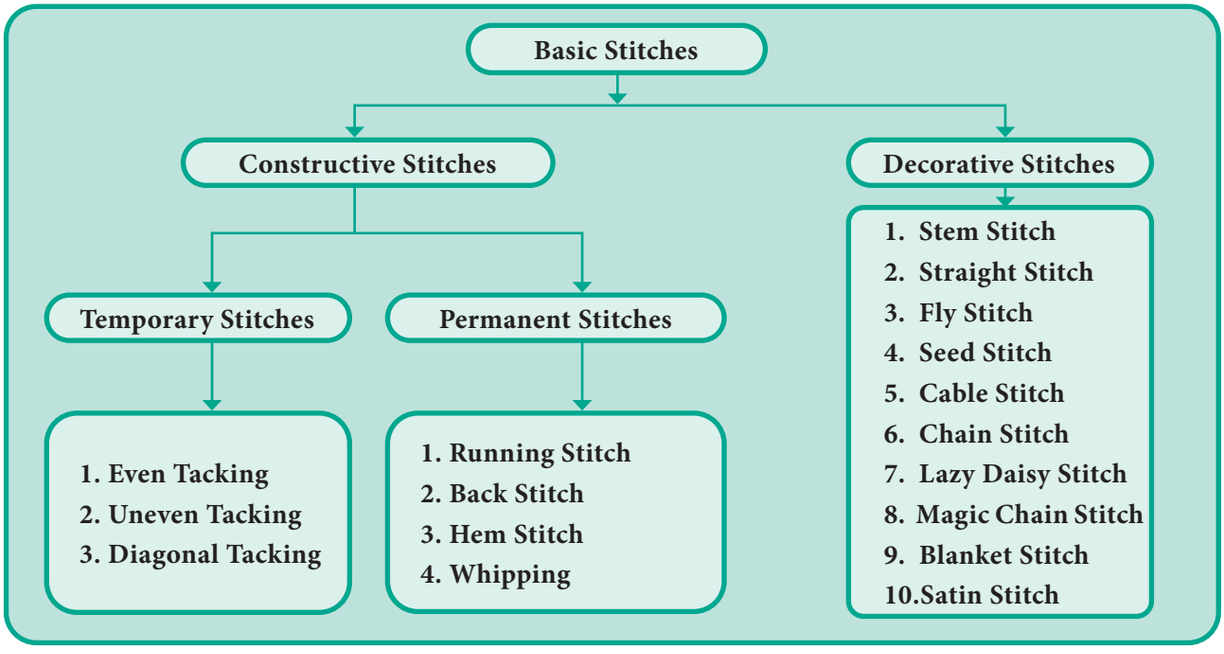


Figure 9.7 Seam Allowance

9.3 CLASSIFICATION OF STITCHES

Stitches can be classified based on their use in garments. There are various types of stitches used and can be classified as given below;



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9.4 BASIC STITCHES

Temporary Stitches

Even basting

Basting stitch is used to examine the fit of a garment before sewing by basting seams together. The even basting stitch looks a lot like the running stitch, except it has longer stitches.

Figure 9.8 Basting

Uneven basting

The uneven basting stitch is used to secure the underlining to the fabric of the garment. It is also used to mark style lines in the garment. It differs from the even basting stitch in that it is a short stitch across the back of the fabric and a long stitch across the front, (Figure 9.8).

Diagonal basting

It is used to stitch two or three layers of fabric together. Example All the layers of a coat namely the fabric, the interfacing and the padding are sewn together.

Permanent Stitches

These stitches are made permanently on the fabric. They need not be removed. Some of the permanent stitches are listed as follows;

- Running stitch
- Hem stitch
- Back stitch
- Whipping stitch

Running Stitch

It is similar to even tacking but the stitches are much smaller. Stitches are fine and evenly spaced with matching colour thread. Darning, gathering and edge finishing can be done with this stitch, (Figure 9.9).

Figure 9.9 Running Stitch

Back Stitch

It is a strong stitch. It is substituted for machine stitch. Stitches are 0.25cm long on the right side. Stitches are done with matching colour thread, (Figure 9.10).

XI_EM_TDD_CHAP09_2022.indd 98 24-01-2023 13:28:38

Figure 9.10 Back stitch

Hem Stitch

These stitches are very fine and evenly spaced. On the right side of the garment or cloth, stitches are not visible. Edges of sleeves, skirt hemline, neckline and hand kerchiefs are finished with hem stitch, (Figure 9.11).

Whipping Stitch

This stitch is used to finish the raw edges of fabrics. Edge of sleeves and kid's collars are finished with whipping stitches. It is also called as rolled hem or over casting. Stitches are made over the rolled edge of a fabric, (Figure 9.11).

Figure 9.11 Hem Stitch and Whipping Stitch

Decorative Stitches

Embroidery is the art of using decorative stitches. With these stitches ornamental motifs can be worked on almost all soft surfaces. It is important to know all the basic embroidery stitches so that the learner can effectively uses them for creating beautiful design. Stitches are selected based on the fabric and garment.

Stem Stitch

It is a commonly used stitch in embroidery work. It is used to complete the outline of any design. It is also used as a filling stitch when worked closely, (Figure 9.12).

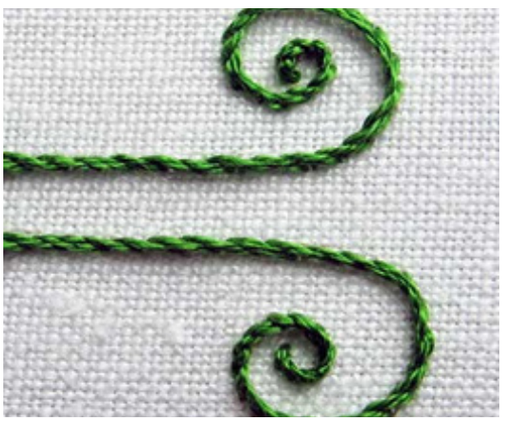


Figure 9.12 Stem Stitch

Straight Stitch

These stitches can be worked in any direction. The stitches are worked in varying sizes to create an interesting effect. This is worked on a evenly woven fabric. It is also called as single satin stitch. Right and wrong side of this stitch is similar, (Figure 9.13).

Figure 9.13 Straight Stitch

XI_EM_TDD_CHAP09_2022.indd 99 24-01-2023 13:28:39

Fly Stitch

These stitches can be worked horizontally or vertically. It is also used as a single detached stitch. It can be used well to cover a line or to do filling for a large space, (Figure 9.14).

Figure 9.14 Fly Stitch

Seed Stitch

This is a tiny running stitch. It is used to fill small motifs or space, (Figure 9.15).

Figure 9.15 Seed Stitch

Cable Stitch

It is also known as side to side hem stitch. Looks like a brick stitch, (Figure 9.16).

Figure 9.16 Cable Stitch

DO YOU KNOW?

When did embroidery originated?

The origin of embroidery can be dated back to Cro-Magnon days or 30,000 BC. During a recent archaeological find, fossilized remains of heavily hand-stitched and decorated clothing, boots and a hat were found.

Embroidery Frame

Chain Stitch

It is formed by making series of loops. It is the oldest of all stitches, (Figure 9.17).

Figure 9.17 Chain Stitch

Lazy Daisy Stitch

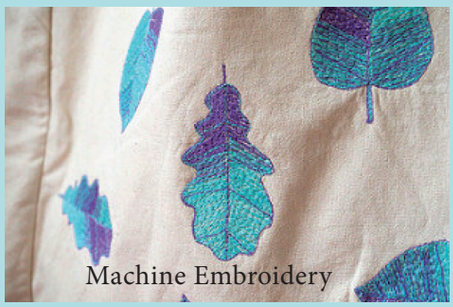
It is one of the detached stitches.A single chain stitch forms a lazy daisy stitch., (Figure 9.18).

Figure 9.18 Lazy Daisy Stitch

XI_EM_TDD_CHAP09_2022.indd 100 24-01-2023 13:28:39

What is Free-motion machine embroidery?

Free-motion machine embroidery creates designs by using a basic zigzag sewing machine. As this type of machine is used primarily for tailoring, it lacks the automated features of a specialized machine.



Machine Embroidery

Magic Chain Stitch

This is a variation of chain stitch.Two coloured threads are used while stitching. Chain stitches are created by winding alternate colour threads, (Figure 9.19).

Figure 9.19 Magic Chain Stitch

Blanket Stitch

This stitch is used to finish the blanket edges. It is stitched from left to right or right to left from a stitch to secure the edges., (Figure 9.20).

Figure 9.20 Blanket Stitch

Satin Stitch

Satin stitch is a filling stitch.It is used to cover small space.This is a straight and flat stitch, (Figure 9.21).

Figure 9.21 Satin Stitch

9.5 CLASSIFICATION OF MACHINE STITCHES

Classification of Machine Stitches-The fundamental formation of a loop or a turn to hold a fabric with another fabric or accessory is known as stitch. It can be done for decoration also. The use and type of stitches vary depending upon the type of fabric stitched. The most common machine stitches used in the garment industry are as follows;

Stitch Class 101- It is also known as Single Thread Chain stitch. This is used as temporary basting. It is a single stitch formed by one thread in the needle, (Figure 9.22a).

Stitch Class 201- It is formed by passing two needle threads into the same

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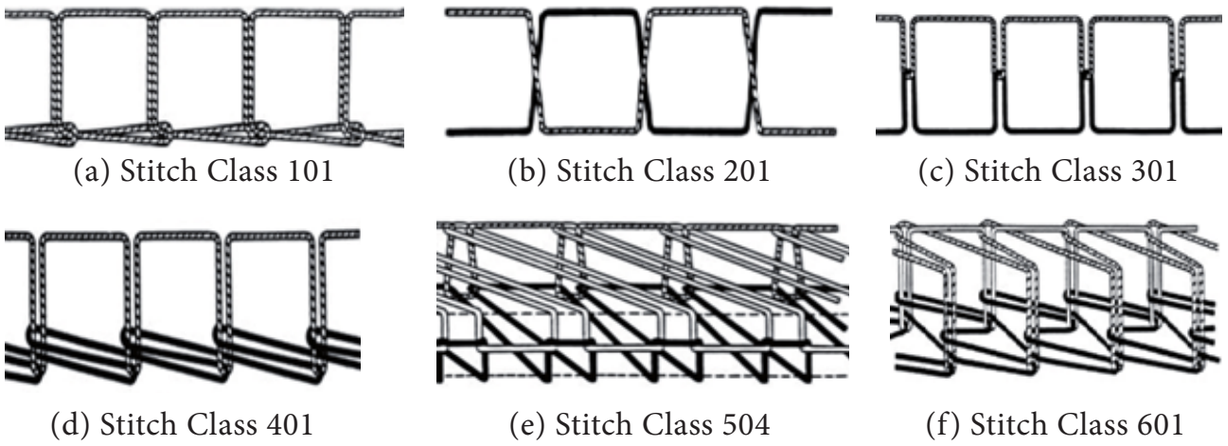

(a) Stitch Class 101 (b) Stitch Class 201 (c) Stitch Class 301

(d) Stitch Class 401 (e) Stitch Class 504 (f) Stitch Class 601

Figure 9.22 Classification of Machine Stitches

perforations from opposite directions without interlacing or interlooping. They look similar on both the sides, (Figure 9.22b).

Stitch Class 301 – It is commonly known as Lock stitch. It gives a strong, low bulk seam and looks alike on both sides of the sewn fabric, (Figure 9.22c).

Stitch Class 401- It is formed with one needle thread and one looper thread. Loops of needle thread are passed through the material and interlaced and interlooped with loops of bobbin thread. Its uses are hemming of knitted garments and attaching of elastic/lace on underwear and lingerie , (Figure 9.22d)

Stitch Class 504 – It is formed with one needle thread, one looper thread and one cover thread. This stitch covers the edge of the material and provides additional seam security, (Figure 9.22e).

Stitch Class 601- It is formed with two needle threads and one looper thread, where the needle thread passes through the material and loop thread passes underside. The additional top thread can add protection and decoration, (Figure 9.22f).

9.6 COMPUTERIZED EMBROIDERY

Hand embroidery is a classic trend. It has been used in almost all types of garments. In today's era machine is used to transform hand embroidery to machine stitched embroidery. Delicate hand embroidery stitches are stitched on desired fabric. Specific instruments and coding are done in machine to create uniform sized designs and colours. Computerized embroidery (Figure 9.23) is used by small scale to large scale industries. The main advantages in using the computerized embroideries are;

- Uniform and accurate designs can be created
- High production at shorter period of time
- Designs can be altered or modified or resizing of embroidery is possible

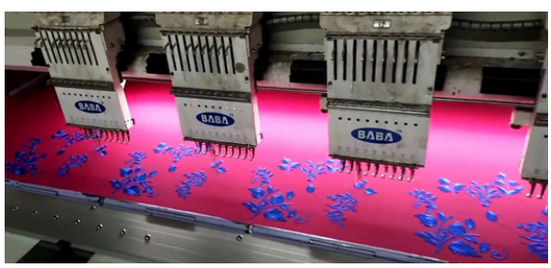

Figure 9.22 Computerized Embroidery

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9.7 SUMMARY

Sewing terminologies are used while selecting a fabric or cutting or sewing garments. A clear idea about these terms lays a strong foundation for garment construction. Basic stitches are used as a foundation prior to garment construction. These are used to enhance the functionality and decoration of the garments. These basic stitches are used as guidelines while sewing. Embroidery stitches add interesting effect on garments. They can be applied on all types of kids, children, women and men garments.

POINTS TO REMEMBER

- Grain is denoted by the direction of the yarns in a fabric as lengthwise and crosswise grains
- Selvedges are the finished lengthwise edges of a fabric.
- Sewing notches are the little triangles or markings on your sewing pattern that help you match up your garment panel pieces.
- Basic stitches are two types namely constructive and decorative
- Constructive stitches are used as guidelines prior to sewing.
- Decorative stiches are used effectively to add beauty to the garments.

ACTIVITIES FOR THE TEACHER

- To teach various basic and embroidery stitches.
- To make the students to prepare a design album for embroidery

ACTIVITIES FOR STUDENTS

- To prepare a motif for each embroidery stitch.
- To make a sample with embroidery stitches.

GLOSSARY

1.	Tack	A temporary stitching before making permanent stitch.
2.	Right side	The front side of fabric which should be outside of finished garments.
3.	Right side together	Right side of the fabrics facing each other.
4.	Wrong side	The side of the fabric which should be inside of the finished garment.
5.	Embroidery	Craft to decorate fabric using needle and thread.
6.	Grain	For woven textiles, grain refers to the orientation of the weft and warp threads
7.	Stitch Length	It is a distance between two consecutive punches of a needle in one step sewn by a sewing machine

XI_EM_TDD_CHAP09_2022.indd 103 24-01-2023 13:28:39

QUESTIONS AND ANSWERS

PART – I

Objective Questions:

1. Grain refers to the …….. of the yarn in fabric.

   (a) Direction (b) Strength

   (c) Twist (d) Count

2. SPI refers……

   (a) Stitch density

   (b) Thread colour

   (c) Class of Stitch

   (d) Stitch per inch

3. Stitches are made of equal lengths in_____.

   (a) Even Tacking

   (b) Uneven Tacking

   (c) Diagonal Tacking

   (d) Tailor's Tacking

4. This is used for holding two or three layers of fabric before sewing.

   (a) Even Tacking

   (b) Uneven Tacking

   (c) Diagonal Tacking

   (d) Tailor's Tacking

5 Term that is used to finish the raw edges of the fabric.

   (a) Back stitch

   (b) Hem stitch

   (c) Whipping stitch

   (d) Machine stitch

6. The art of using decorative stitches is called _____.

   (a)Printing (b) Weaving

   (c) Embroidery (d) Knitting

7. A tiny running stitch is also called as _____.

   (a) Stem stitch

   (b) Chain stitch

   (c) Fly stitch

   (d) Seed stitch

PART – II

Answer in Three (or) Four Points:

1. Define grain and its types.
2. What is a selvedge?
3. Define stitch length.
4. Write about stitching line
5. Mention the advantages of computerized Embroidery
6. What are the uses of even tacking?
7. List different types of permanent stitches.
8. Describe whipping stitch.
9. What are the uses of back stitch?
10. What is hem stitch?

PART – III

Answer in a Paragraph

1. Write in detail about computerized Embroidery
2. Explain the method of making a satin stitch.
3. Draw a simple motif showing 4 embroidery stitches.

PART – IV

Answer in one Page:

1. Describe any 5 decorative stitches.
2. Explain in detail about constructive stitches.

Answers for Objective Questions:

1.(a) 2.(d) 3.(a) 4.(c)

5.(c) 6.(c) 7.(d)

XI_EM_TDD_CHAP09_2022.indd 104 24-01-2023 13:28:39

CHAPTER

10

SEAMS AND FULLNESS

LEARNING OBJECTIVES

- To gain knowledge about types of seams and fullness
- To acquire skills in constructing the various seams, seam finishes and fullness.

10.1 INTRODUCTION

Sewing is an interesting art, which has many intricate details. It is also described as needle intricate work or needle craft. Sewing can be done with needles by hand or machines. The Stone Age men used bone needles to join animal skins with twigs as thread. Today there are varieties of needles, threads and machines to join different type of fabrics. In order to make a dress one should know the basic concepts of sewing. The basic concepts of sewing includes:

- Seams
- Fullness

10.2 SEAMS AND TYPES OF SEAMS

Dress making is the art of cutting and sewing flat fabrics to suit a three dimensional human figure. Sewing cut fabrics together is referred as Seam. Seam is sewing two or more cut fabrics together. Seams can be hand or machine stitched.

The main factors affecting seam selection are;

- Thickness of the fabric
- Design and type of dress
- Use of the dress
- Place where the seam appears
- Age and sex of the wearer
- Fashion

Types of Seams

There are different types of seams. The most common types of seams are Plain seam, Run and fell seam, French seam, Mantua maker seam and Piped seam.

Plain Seam is the most important and simple seam that can be used for all type of dresses. Plain seams are easy to stitch, (Figure 10.1). This seam can be used to stitch all types of fabric except very light, transparent or fabrics which tend to ravel off. This seam is commonly used on

XI_EM_TDD_CHAP10_2022.indd 105 24-01-2023 13:31:43

armholes, side seams of blouses, frocks and skirts. The main advantage of this seam is that it requires very little time to sew.

Run and Fell Seam is commonly known as flat fell seam. It can be stitched using hand stitches or machine. The main advantage of this seam is its strength and durability. The amount of time taken to stitch this seam is more when compared to all other seams. It is not suitable for curved edges and bulky fabrics. This seam is common on children's dresses, sports garments and shirts, (Figure 10.2).

French Seam is also known as double seam. It is a thick seam, so best suited for thin and delicate material. The disadvantages are that it cannot be done on curved edges or on thick fabrics. This seam is common on children's clothing and silk or light weight dresses. The main advantage of this seam is its durability and neat shears, (Figure 10.3).

Mantua Maker's Seam is a simple seam, which is suitable for medium thick materials, (Figure 10.4). It gives a simple, neat and thick look.

Piped Seam is a modification of the plain seam, (Figure 10.5). It adds decoration to the dress. This seam is stitched by inserting a cord or a bias strip into the plain seam. It can be used around the neck, waist, armscye, yoke lines, side seam. Contrast colour piped seam add interest to garments.

10.3 SEAM FINISHES AND TYPES OF SEAM FINISHES QR CODE

The raw finishes or edges of the seams ravel out easily; therefore finishing them is a very important task in garment construction. The raw edge of the seams is finished by different methods like double stitch over cast stitch, herring bone stitch, hem stitch, zig-zag stitch and bound finish.

Double Stitched Seam is done by sewing another or a second row of stitches about 0.25cm away from the original seam, (Figure 10.6). This can be a straight or a zig zag stitch. This seam is done on curled material where ravelling of the seam is higher. *Example*: Knitted Jersey.

Pinked finish is given by cutting the edges of the seams with pinking shears, (Figure 10.7). This is a simple and easy method. It requires lesser time to finish. It is not suitable for material which tends to ravel easily. Example: Satin.

Figure 10.1
Plain Seam

Figure 10.2
Run and Fell Seam

Figure 10.3
French Seam

Figure 10.4
Mantua Maker Seam

Figure 10.5
Piped Seam

Types of Seams

XI_EM_TDD_CHAP10_2022.indd 106 24-01-2023 13:31:43

Stitched and Pinked Seam (Figure 10.8). First the fabrics are joined by a plain seam, (Figure 10.8). Then the raw edges are trimmed using pinking shears. This seam finish is not suitable for seams which ravel easily.

Herring Bone Seam Finish is done by folding the raw edges flat on the dress and working a row of herring bone stitches, (Figure 10.9). This finish is very neat because the raw edges are not visible. It is suitable for heavy materials. Example: Men's coat.

Hem Stitched Seam Finish is similar to herring bone seam finish. In this finish the raw edges are folded and pressed towards the dress and a row of hem stitch is done, (Figure 10.10). This looks very neat because only small dotted line is seen on the right side.

Overcast Seam Finish is a finish which is suitable for both thick and thin fabrics,which fray easily. It can be used for seam along the armscye, yoke lines and even in hem lines. A plain seam is made first. Then the raw edges are completed separately with overcast stitches, (Figure 10.11).

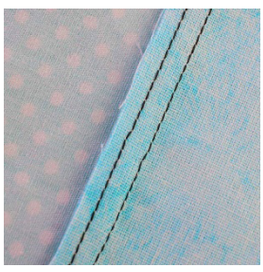

Figure 10.6
Double Stitched Seam Finish

Figure 10.7
Pinked Finish

Figure 10.8
Stitched and Pinked Seam

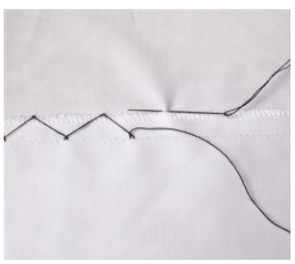

Figure 10.9
Herring Bone Seam Finish

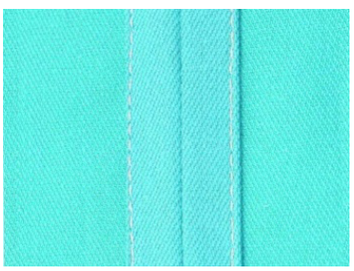

Figure 10.10
Hem Stitched Seam Finish

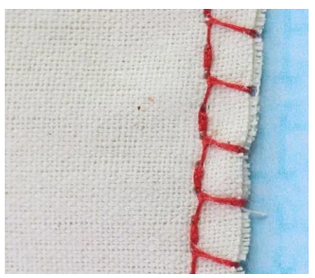

Figure 10.11
Overcast Seam Finish

Figure 10.12
Edge Stitched Seam Finish

Figure 10.13
Zig Zag Seam Finish

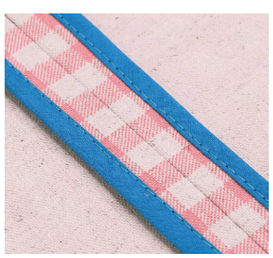

Figure 10.14
Bound Seam Finish

Types of Seam Finishes

XI_EM_TDD_CHAP10_2022.indd 107 24-01-2023 13:31:43

In Edge Stitched Seam Finish the raw edges are pressed open, folded down and a row of top stitch is done on both raw edges without attaching it to the dress. This seam gives a neat look. Due to its thickness, it is not suitable for curved edges, (Figure 10.12).

Zig Zag Seam Finish is done by holding both the edges of the seam together and making a row of zig zag stitch. It is best suitable for fur material, (Figure 10.13).

Bound Seam Finish is done by stitching around the open seam with binding on the wrong side.The stitch is made along the seam edges, (Figure 10.14). This seam is best suitable for finishing seams on unlined coats and sports jackets.

10.4 FULLNESS

Fullness is done to shape a garment. It also aids in garment fitting. It adds interesting design details in a garment. Fullness offers easy movement and comfort to the wearer. There are different types of fullness. Some of the most common types of fullness are darts, tucks, pleats and gathers.

Darts and Types of Darts

Dart is a triangular fold which acts as an essential part in dress making. It shapes a flat piece of fabric to fit into natural curves of the body in bust area, armhole, neckline and waist. They are mostly used in women's garment. Darts are usually done as the first step in garment making. It controls fullness and adds shape and fit to the garment.

The two types of darts are **Single Pointed and Double Pointed Darts.**

Single Pointed Dart is also called as standard dart (or) half dart. These darts are in triangular shape, wider at one end, and narrower on the other end. Single point dart is used in blouse, skirts, pants, frocks and kameez (Figure 10.15).

Double Pointed Dart is also called as fulldart. These darts are pointed at both the ends and wider at the middle. When stitched on heavy fabrics a slash is done along the wider part of dart. Double pointed dart is used in bodice of plain blouse and kameez (Figure 10.16).

Tucks and Types of Tucks

Tuck is a fold in a fabric which is stitched down to add fullness to the garment.

Figure 10.15
Single Pointed Dart

Figure 10.16
Double Pointed dart

Types of Darts

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They help in shaping a garment and they should be in even width. Tucks can be done on the right side or wrong side of the garment depending whether it is used for decorative (or) functional purpose. They create a decorative element which can also add fullness to a garment. In fine and delicate fabric, they look more attractive.

The different types of tucks are Pin tuck, Cross tuck, Piped tuck and Shell tuck.

Pin Tucks are fine narrow fold of about 0.25cm sewn from top to bottom, (Figure 10.17). They can be stitched in single or in group. It is mostly used for decorative purpose hence done on specific area of the garment like the yoke of a frock. Pin tucks are usually worked on kid's garments, lady's dresses, yokes and shirt for decorative purpose.

Cross Tucks are similar to pin tucks which are sewn both on cross wise direction and in length wise direction forming a checked effect, (Figure 10.18).Cross tucks are used to decorate ladies and kids wear and house hold linens (curtain, table cloth). They create pleasing effect on yokes, pockets and larger areas.

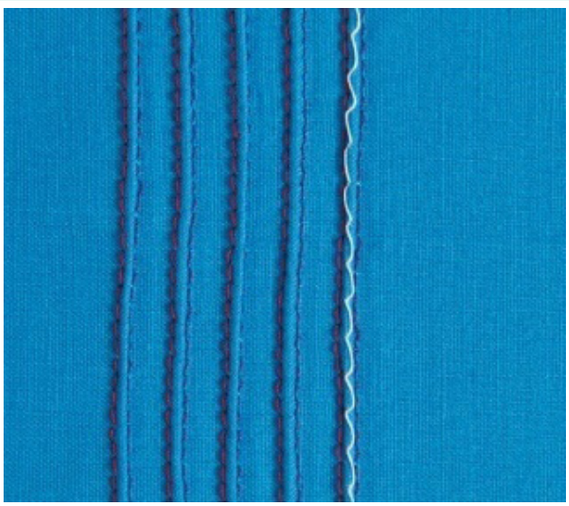

Figure 10.17 Pin Tuck

Figure 10.18 Cross Tuck

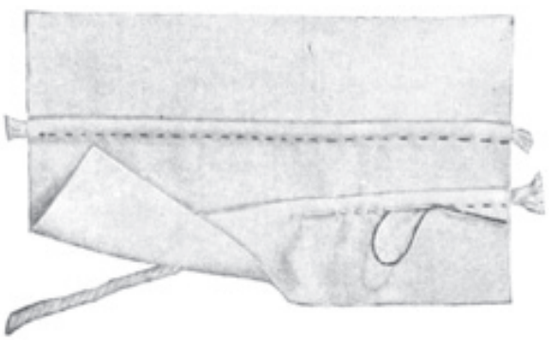

Figure 10.19 Piped Tuck

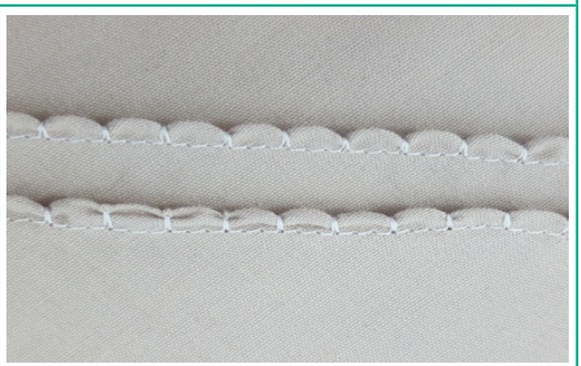

Figure 10.20 Shell Tuck

Types of Tucks

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Piped or Cord Tucks are tucks made by placing a cord at the edge of the on the wrong side. A row of stitches is made close to the cord. The stiffness of the tucks will depend on the type of cord used. The cords used can be of any thickness, (Figure 10.19). Cord tucks are used in children's garments to produce stiffness.

Shell or Scalloped Tucks resemble blanket stitch and produce a scalloped effect on the garment, (Figure 10.20). Shell or scalloped tucks are used on delicate fabric, lingerie, children garment, night wear, around armhole and necklines.

Pleats and Types of Pleats

Pleats are folds in a garment done on the waist line of skirts, yokes and sleeves at equal distance to release fullness. Pleats are done on top and fall neatly to the bottom of fabric. The material required to make a pleat is three times the size of a finished pleat. They create eye movement and can be used as style detail. The effect of pleat varies depending on the fabric used. The depth of pleat depends on the weight of fabric and the effect required. The different types of pleats are knife pleat, box pleat, Inverted box pleat and Kick pleat.

Knife Pleat is a fold made by a row of stitch in same direction, generally at the top where the pleats start. They can be used continuously, grouped (5 or 6) can be used as a single pleat. They form a sharp edge at the top and then flare out. Knife pleat is used in ordinary skirt, pants and frock, (Figure 10.21).

Box Pleat is two knife pleats facing in opposite direction, (Figure 10.22). The edges of the box pleat touch each other. If two set of box pleats made at the same point it is called as double box pleat. Box pleat is used in children garment, school uniforms, skirts, center back of gent's shirt. It can be used as a design detail on pockets.

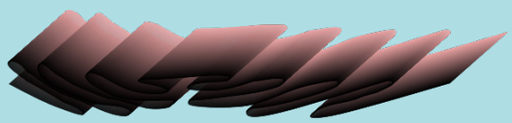
Inverted Box Pleat is the opposite of a box. It is made up of two knife pleats turned towards each other so that the folds meet in the middle on the right side of the garment, (Figure 10.23). It is usually designed at center front or center back and looks like two knife pleats facing away from each other on the underside. Inverted pleat helps to keep the bulk of the pleats' assembly hidden from sight.

Kick Pleat is a plain pleat, knife pleat or box pleat is stitched along the fold till the desired length for freedom of movement is termed as kick pleat, (Figure 10.24). It releases fullness at base. Kick pleat is used in sportswear, frocks and skirts.

DO YOU KNOW?

What is Kingussie pleats?.

The first pleats were Kingussie pleats, which were made in a small town in Scotland, named Kingussie after it. Kingussie pleats is a single centrally located box pleat in the rear of the Kingussie with knife pleats fanning out on either side



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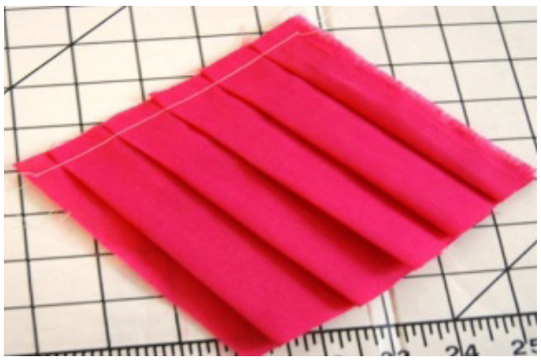

Figure 10.21 Knife Pleat

Figure 10.22 Box Pleat

Figure 10.23 Inverted Box Pleat

Figure 10.24 Kick Pleat

Types of Pleats

When was the first pleat designed and made?.

The first pleat was introduced in ancient Egyptian garments called linen Tunics used by the upper class of people. No one is quite sure how the ancient Egyptians pleated linen garments. But two ways have been suggested: the cloth could simply be folded, accordion style, then tied, and wetted. When the cloth was dry and the ties taken off, the cloth would have had pleats. Another possibility is that cloth was pressed onto wooden boards that had furrows in them, and a kind of glue, sizing, was painted on to the linen to make it hold the pleats.

Gathers

Gathering is drawing up fullness into a predetermined size. Shirring is formed by multiple rows of gathers and is a way to create controlled fullness, like at a waistline, cuffs or a bodice yoke.

Gathers are used for distributing fullness evenly in a given area, (Figure 10. 25). The material required will be twice the width or it can be varied based upon the effect required. Stiff cotton produces

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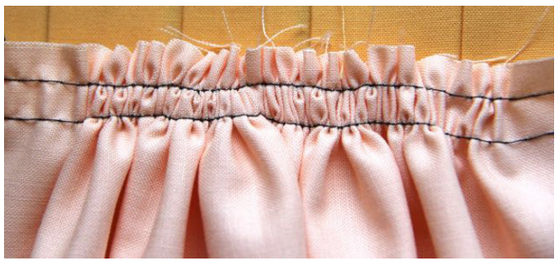

Figure 10.25 Gathers

crisp effect, but other man-made fibre or silk gives a graceful effect. Gathers can be done by hand, machine or by elastic. Gather are used in neckline, sleeves, waistline and yoke.

Applications of Fullness in Apparels

S.No	Name of fullness	Application apparels
1	Single dart	To control fullness in blouse, skirts and other garments.
2	Double dart	Around the neckline for decoration At the waist line of A line frock, kameeze and single piece garment.
3	Pin tucks and cross tucks	In yokes of kids apparels and kameeze, sleeves of frock and middy tops.
4	Piped tucks and shell tucks	For decorative purposes of women and kids wear at hem line, sleeve, yoke, collars and pockets.
5	Knife pleat	In skirts, blouse, shirts and kameeze for fullness or decorations.
6	Box pleat and inverted box pleats	In uniform shirts, knickers, skirts, Blouse and kids wear.
7	Kick pleats	In skirts, middy tops and kameezes.
8	Gathers	In all types of women and kids wear.

10.5 SUMMARY

Seams are most important concept of a dress. Correct seam and seam finish should be done on dresses based upon the placement of the seam, age of the wearer, type of material and dress. The strength of seam increases the life of the dress. Seam finish adds strength and beauty. Fullness helps a fabric to fit in natural curves of body, and make a garment look attractive. Darts gives shape to contour. Pleat, gather and tuck releases fullness in any part of garment. Selection of the type of fullness depends on the type of material.

GLOSSARY

1.	Double pointed dart	Dart wide in middle and pointed at end.
2.	Single pointed dart	Dart narrow at one end and wide on the other end.
3.	Tuck	Stitched fold in a garment.
4.	Pleat	Fold in a garment held by stitching on top.
5.	Baste	To stitch with long stitches for holding two pieces of fabric temporarily.
6.	Seam	Row of stitches that join cut fabrics.
7.	Seam Finishing	Covering the raw edges of the seams

XI_EM_TDD_CHAP10_2022.indd 112 24-01-2023 13:31:44

POINTS TO REMEMBER

- Joining of two pieces of fabrics is called as seams.
- Seams can be done by hand or machine.
- Seam finish adds strength to the seams and neat look to the garment.
- Pleats, tucks and gathers releases fullness.
- Darts shapes flat pattern.
- Fullness adds decoration to a garment

ACTIVITIES FOR THE TEACHER

- Show the garment pictures finished with various seam, seam finishes and fullness

ACTIVITIES FOR STUDENTS

- Draw different types of seams, seam finishes and fullness.

QUESTIONS AND ANSWERS

PART – I

Objective Questions:

1. Run and fell seam is also known as_____.

   (a) Plain seam

   (b) French seam

   (c) Piped seam

   (d) Flat felt seam

2. Type of seam used on transparent and light weight fabrics

   (a) French seam

   (b) Plain seam

   (c) Piped seam

   (d) Double seam finish

3. Overcast seam finish is more suitable for_____.

   (a) Narrow seam

   (b) Yoke edges

   (c) Side seams

   (d) Hem lines

4. A row of small dots are seen in_____.

   (a) Yoke seams

   (b) Hem stitched seam finish

   (c) Bound seam finish

   (d) Pinked seam finish

5 Insertion of cords are used to stitch _____.

   (a) Plain seam

   (b) French seam

   (c) Piped seam

   (d) Flat felt seam

6 _____ are triangular folds.

   (a) Darts
   (b) Pleats
   (c) Tucks
   (d) Gathers

XI_EM_TDD_CHAP10_2022.indd 113 24-01-2023 13:31:44

7. Double pointed dart is called as _____.

   (a) Full dart
   (b) Half dart
   (c) Standard dart
   (d) Curved dart

8. Cord is used in _____.

   (a) Pin tuck
   (b) Cross tuck
   (c) Piped tuck
   (d) Shell tuck

9. Material required for making pleat.

   (a) 2 times more
   (b) 3 times more
   (c) 4 times more
   (d) 5 times more

10. Which pleat stitch is sewn near the fold?

    (a) Knife pleat
    (b) Box pleat
    (c) Accordion pleat
    (d) Kick pleat

PART – II

Answer In Three (Or) Four Points:

1. Describe flat felt seam.
2. Differentiate between plain and piped seam.
3. What is single dart?
4. Write short notes on cord tuck.
5. List the importance of pleats.
6. Illustrate cross tuck.

PART – III

Answer in a Paragraph

1. Write short notes on bound seam finish.
2. Give a brief note on plain seam.
3. State the suitability of french seam in garments.
4. Explain pin tuck.
5. Illustrate knife pleat and briefly explain.
6. Briefly explain the application of gathers in a garment.

PART – IV

Answer in one Page:

1. List the type of seams which cannot be used for thick fabrics and explain them.
2. Discuss in detail about the different types of seam finishes.
3. Give an account on darts with a diagram.
4. Explain any two types of pleats.

Answers for Objective Questions:

1.(d) 2.(a) 3.(b) 4.(b) 5.(c)
6.(a) 7.(a) 8.(c) 9.(b) 10.(a)

XI_EM_TDD_CHAP10_2022.indd 114 24-01-2023 13:31:44

CHAPTER

11

GARMENT COMPONENTS

LEARNING OBJECTIVES

- To understand the basic components of garments.
- To acquire skills in selecting and sewing suitable garments components.

11.1 INTRODUCTION

Garment is a piece of cloth which is stitched to suit a human figure. It is also called as dress or apparel. Garment has two main parts, namely front bodies and back bodies. The bodices front and back can make a complete upper garment. By extending their hem lines it can be made as a garment to cover the upper and lower part of the body. But to create variations in garments and to cover body parts like hands other details should be added to garment. The most important garment details are necklines, collars, sleeves, skirts, pockets and yokes.

11.2 NECKLINES

The section of the bodice pattern that wraps around the neck is known as the neckline. It is different in shapes and sizes. The neckline is a crucial component of any garment. One should be very careful while selecting a neckline and also while stitching it. A neckline should not only be comfortable but should also suit one's face and body shape. Neckline can be divided as front bodice neckline and back bodice neckline. Correct neckline can help to modify the look of the wearer. Neckline can be used as decoration on dresses. The

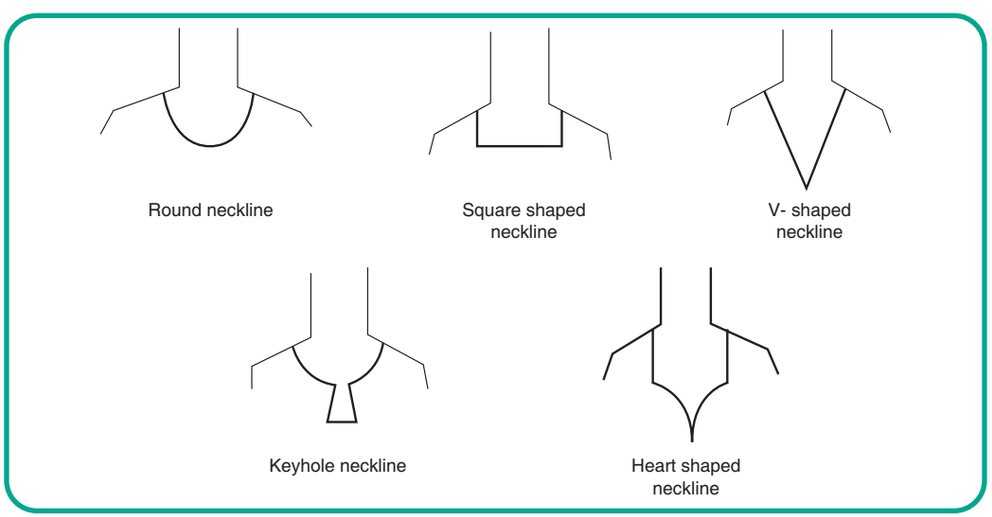

Figure 11.1 Shapes of Necklines

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depth and width of neckline depends upon the wearers choose, age, sex, type of fabric used and the type of dress (Figure11.1).

11.3 TYPES OF NECKLINES

Name of the Neckline	Description	Suitable Materials	Suitable Dresses
Round	• Circular Shape • Curved towards center front • Front neckline deeper than back • Piping can be added for decoration	All types of fabric	• Blouse • Midi tops • Kurta • Baby frocks
Square	• Square shape • Have four sharp corners, two in the front and two at the back [midway from center front to side seam] • Facing can be made with contrast colour fabrics	All types of fabric stiff and thick fabric	• Blouse • Kurta • Kameez • Children frocks
V Shaped	• Forms a V Shape in the front at center front line • Back neckline is round and usually high • Finished as fitted facing	All types of fabric	• Blouse • Kurta • Kameez
U Shaped	• U shaped front neckline • Back neckline is high or stand collar can be used	All types of fabrics	• Blouse • Kurta • Kameez
Heart Shaped	• Front neckline deeper than back • Back line can be round or high neck • Front neckline shaped like a heart	All types of fabrics	• Blouse • Tops • Dresses • Kameez
Boat	• Broad at the collar bone and shallow at the center. • Very little and difference between front and back neckline	Light weight fabrics netted fabrics	• Fancy sari blouse • Midi tops
Halter	• Neckline looks like a semi-circle in the front • No back bodice patterns. • Front is connected with a tie back cord at the back neck	Soft fabrics, light weight fabrics (lining added)	• Kids • Partywear • Frocks • Dresses
Scoop	• Low front neckline • Pot shaped. • Known as pot neckline	All type of fabrics	• Kameeze • Dress
Keyhole	• High neckline at the back • Front neckline shaped like a Keyhole (2 to 3 cm wide)	All type of fabrics	• Kameeze • Dress

XI_EM_TDD_CHAP11_2022.indd 116 24-01-2023 13:35:13

Name of the Neckline	Description	Suitable Materials	Suitable Dresses
Cowl	• Folds around front neckline • One or more-fold as decoration • Bias cut fabric is used	Light weight draped fabric or flexible fabric	• Partywear • Women's dresses
Wedge	• Wedge shaped in the front • Close at the highest point of the shoulder • Spread outward at the base • Deep in the front • High neck at back • Lines can be curved or shaped	Any types of fabric	• Partywear • Kameeze • Dresses • Frocks
Draw String	• Insert cord or band. Pull the neckline to suit one self. • Cord pulled to adjust at neckline	Any type of light weight or Soft fabric.	• Baby frocks • Infant dresses (jabla)

11.4 NECK FINISHING

Finishing the neckline is of great importance. It has an impact on the final appearance of the garment and is put under a lot of strain while being worn, especially in dresses with no closures. Hence the neckline finish must be stronger. Neckline finish increases the durability of the garment. It retains the shape and size. Because of their stretchability, bias strips are commonly used to complete necklines. Generally, necklines are finished with facings, bindings or collars.

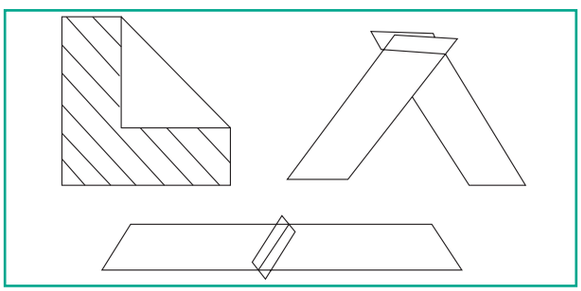

Figure 11.2 Joining of Bias Strips

Bias piece

A true bias is cut along the diagonal line at 45° to the lengthwise or crosswise grain. The maximum elasticity in any fabric is found in the true bias direction. Bias stripes can be applied as facings and bindings. It is especially used for finishing curved edges such as neckline, sleeveless, armholes and scallops.

Binding or Piping

Bias binding or piping is used to finish and strengthen raw edges. It can be added as a decorative trim to a garment. On both the right and wrong sides of the clothing, it is visible. When done, bias binding should be

Figure 11.3 Bias Binding

XI_EM_TDD_CHAP11_2022.indd 117 24-01-2023 13:35:14

uniform in width and lie flat and smooth on the right side of the garment with no visible stitches. There are two kinds of bias binding, Single bias binding and French binding (Figure11.3).

Figure 11.4 Bias Facings

Facing

Facing is used to provide a neat finish to the raw edges in a garment. It also supports the shape of a neckline, armhole and collars. When the neckline is straight, the facing must be cut in one piece with the garment section. If the shape is curved, the facing must be cut in bias. Bias facings can be applied on the right side of the garment for decorative effects. Decorative facings are usually made with scalloped points or other designs along the outer edge. (Figure11.4).

11.5 COLLARS

To improve the appearance of a neckline, a collar is attached. Collars are made of double layer of fabrics. It also helps to finish the raw edges of the neckline. Since collars form a background to the face they should suit the wearer. Several factors are considered while designing collars. Some of the major factors are design of fabric, colour and texture of the fabric, pattern of the garment, purpose and use of the garment, sex and age of the wearer and the appearance of the wearer.

Parts of a Collar (Figure11.5)

- **Band**- The portion of the shirt collar that lifts the collar.
- **Tie space**-The distance between the top points of the collar that have a space to allow for the knot of a tie.
- **Point**- This is the tip of the collar. Some collars have a buttonhole on the point for the collar to be buttoned up.
- **Spread**- The distance from one tip of the collar to the other tip.
- **Slope**- The length of the collar as it slopes to a point from the neckband to the tip.
- **Neckline edge**- Part of the collar band stitched to the neckline.
- **Collar stand**- The height at which the collar stands back on the neckline.
- **Roll line**- Part of the collar that rolls over the collar stand.
- **Lapel**- The portion of the collar that folds over from the neckline and is shaped to match the collar's style.

Types of Collars

The collar edge can be round, curved, square or pointed depending upon design variation. A collar can be made close to or away from the neckline. Some of the types of collars are round collar, peter pan collar, scalloped collar, sailor collar, roll collar, shirt collar, band collar, and shawl collar

Round or One Piece Peter Pan Collar - Children's dresses typically have a

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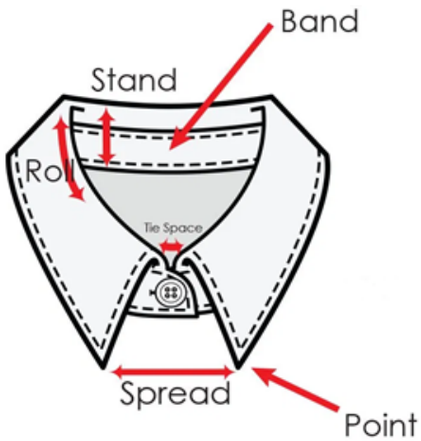

Figure11.5 Parts of Collar

Figure11.6
Peter Pan Collar

Figure11.7 Shirt Collar

Figure11.8 Sailor Collar

Figure11.9 Scalloped Collar

round collar or a one-piece Peter Pan collar. The front collar continues to the back where it is divided with rounded ends. If this collar pattern is cut at the center front and back to get two pattern pieces, it is called two-piece Peter Pan collar, (Figure11.6).

Shirt Collar - Shirt collar, as the name indicates it is used in the men's, women's or kid's shirt. Generally, it consists of two parts commonly known as band to hold the other part which is the collar. Sometimes kid's shirt collars are designed without the stand (Figure11.7).

Sailor Collar -Sailor collar is a flat turned down collar. It has a V shape in front and square shape at the back (Figure11.8)

Scalloped Collar - It can also be created by just shaping the collar edges as scallops. Usually Peter pan collars or round collars are scalloped for decoration(Figure 11.9)

11.6 SLEEVES

Sleeve is a part of the upper garment. It is attached to bodice at the armhole. Sleeves add grace and beauty to any garment. Sleeves can be modified to suit wearers figure. There are different types of sleeves. Some are close fitting and others are stitched with fullness. The sleeve length can be adjusted to create short, elbow, three-fourth and full sleeves. Colour, texture, shape and size of sleeves can also be changed to create sleeve variations. Sleeves are generally cut along straight grain, but to create variation, it can be cut on cross grain also.

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Parts of a Sleeves (Figure 11.10).

- **Cap line** – around the arm, where the arm is separated from the body.
- **Side seam** – where the sleeve is joined to form a tubular structure.
- **Hemline**–finished edge of the sleeve.
- **Upper sleeve round** – around the fullest part of sleeve.
- **Elbow round** – around the fullest part of elbow.
- **Wrist round**- around the part of the arm where the palm starts

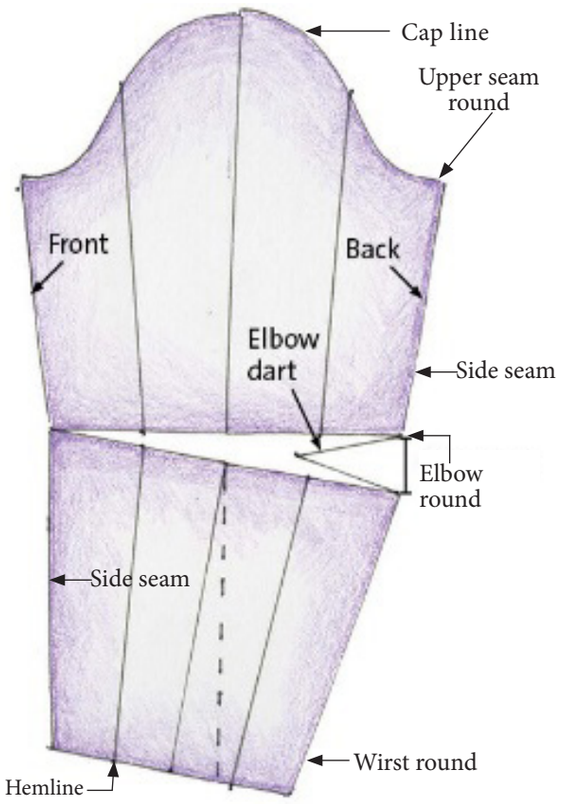

Figure 11.10 Parts of a Sleeve

Types of Sleeves

Sleeves vary depending upon type of garment, the fabric used, one's preferences and needs. The length of the sleeve and fullness in sleeves can be altered, to create new designs.

Plain Sleeve is also known as basic sleeve. It is used with various garments but more popular with sari. It's plain, without any fullness, and it fits well across the armscye and over the upper arm. The length of the sleeve varies depending upon the designer's taste. (Figure11.11).

Gathered Sleeve is a type of sleeve which is also called puff sleeve. It's usually found in dresses and blouses for women. It has fullness either at the top edge or at both, the top and bottom of sleeve part. (Figure11.12).

Bell Sleeve is also prepared with the pattern of the basic sleeve. The pattern is slashed from the bottom edge (and spread) edge to the maximum, for extra fullness. The pattern is drawn on a new sheet and cut. The lower edge is left loose for fullness (Figure 11.13).

Raglan Sleeve is mostly used for sports wear, kids wear and T-shirt. There are no armhole seams or shoulder seams on this shirt. Raglan sleeve is also prepared with the basic sleeve and extension are added to the bodice front and back patterns to draft the final raglan sleeve pattern. This sleeve is stitched with seam that runs from the neck line to the armhole line (Figure11.14).

Kimono Sleeve is mostly used in garments where more comfort is needed. It's usually utilised for sports wear, children's clothing, dancing costumes, and women's tops. In kimono sleeve there is no seam either at the armhole or in the shoulder. The pattern of the sleeve is cut together with the bodice. Thus the sleeves run from the side seam of sleeve to the side seam of the bodice (Figure11.15).

XI_EM_TDD_CHAP11_2022.indd 120 24-01-2023 13:35:14

Figure 11.11 Plain sleeve

Figure 11.12 Gathered Sleeve

Figure 11.13 Bell Sleeve

Magyar Sleeve is also like kimono sleeve where the bodice pattern is extended from the shoulder line approximately 5 cm outside from the highest point of the shoulder. Lower arm circumference is drawn perpendicular to the bodice pattern and attached at the edge of the pattern (Figure11.16).

Figure 11.14 Raglan Sleeve

Figure 11.15 Kimono Sleeve

Figure 11.16 Magyar Sleeve

XI_EM_TDD_CHAP11_2022.indd 121 24-01-2023 13:35:14

11.7 PLACKETS

A placket is made either in an opening left on the seam or by creating a cut in a garment which enables one to wear or remove the garment easily. The placket made on a seam is stronger and gives a better finish.

- A good placket should lay flat on the garment.
- A placket should not be thick and should not have gaps at the edges.
- The position of the placket should be easily accessible.
- The seams of the placket should be strengthened at the closed ends as it has to go through a certain amount of strain during wear.
- While choosing a placket the position of the placket, texture of the fabric, age and sex of the wearer along with the current fashion should be kept inmind.

Types of Plackets

Continuous Bound Placket- These plackets are made on a seam or a cut, but not on curved seams or thick textiles. This is also called as one-piece placket. They are suitable for children's dresses, under garments like petticoats and sleeve openings where a cuff or band is used, (Figure 11.17).

Bound or Faced Two Piece Placket -As the name indicates, this is done with two pieces of fabrics. This placket is commonly used skirts, petticoats and back opening dresses. The over lap and under lap sides are finished with facing and binding respectively, (Figure 11.18).

Miter Placket- It is mainly used in men's shirts, sleeve opening and on neck openings for children's garments where strength is the major requirement. It is also called as tailored placket, (Figure 11.19).

Zipper Placket - Zippers are teeth-like structures made of plastic or metal that can be looped or unlooped by a runner. This is used to open or close the garment. It is attached on the placket. These can be selected based on placket type and colour of the garment. Zippers are available in different colour and length, (Figure 11.20).

Figure 11.17 Continuous Bound Placket

Figure 11.18 Bound or Two Piece Placket

XI_EM_TDD_CHAP11_2022.indd 122 24-01-2023 13:35:14

Figure 11.19 Miter Placket

Figure 11.20 Zipper Placket

11.8 SKIRTS

Skirts are incredible part of a women's wardrobe. Skirts are a type of lower garment worn by both women and girls. It is draped around the waist to fall over the hip to desired length. Skirt length varies according to the wish of the wearer and sometimes it is named based upon the length. Example the skirt which falls up to the floor is known as full skirts. Skirts can be enhanced using fullness or by addition of emblishments and decorations. It can also be made simple in structure or intricate like plain skirt or three layered skirts.

Types of Skirts

Basic Skirt - The basic skirt is also called plain or straight skirt. The basic skirt will feature darts of equal lengths at the waistline in the front and back, controlling fullness. The resulting pattern can be used to make any other skirt. The width of the skirt varies from 15 to 30 cm more than waist measurement (Figure 11.21).

Gathered Skirt-The gathered skirt is otherwise called as full skirts. These types of skirts are gathered onto the waistband.The fullness of the skirt is determined by the amount of fabric in the skirt part of the pattern. The length of a gathered skirt can range from short to full length. It is best in fine to medium weight fabrics. The width of the skirt is three times more than the waistline, measurement, (Figure 11.22).

Pleated Skirt -A pleated skirt is any skirt with vertical pleats starting from the waistline knife pleats, box pleats and inverted box pleats are most commonly used in these skirts, (Figure 11.23).

Circular Skirt- The circular skirt, often known as the skater skirt, is made in the shape of a circle. The fabric is linked to a waistline that fits the wearer perfectly. When the skirt is put flat, it makes a circle. The circular skirt makes a great look for active outdoor wear. Variations of the circle skirt include a half circle skirt or even a double circular skirt for maximum flare, (Figure 11.24).

Mini Skirt - An iconic skirt associated with the 1960's, and as the name implies, it is a very short skirt. Dress designer Mary Quant made this skirt popular. It is inexpensive to make because it only needs a small amount of cloth. Mini skirts are traditionally fitted

XI_EM_TDD_CHAP11_2022.indd 123 24-01-2023 13:35:14

Figure 11.21 Basic Skirt

Figure 11.22 Gathered Skirt

Figure 11.23 Pleated Skirt

Figure 11.24 Circular Skirt

but can also be flared or even circular. Miniskirts made of denim are easy to wear for a casual look, (Figure 11.25).

Figure 11.25 Mini skirt

What is a Hobble Skirt?

A Hobble skirt is a skirt with a narrow hem to significantly impede the wearers stride. It was a short-lived fashion trend that peaked between 1908 and 1914.

Hobble Skirt

11.9 POCKETS

The term "pocket" comes from the French word "poque." It refers to a bag that is sewn into garments. Pockets can be functional or decorative. Small items or valuables are

XI_EM_TDD_CHAP11_2022.indd 124 24-01-2023 13:35:14

kept safe in functional pockets. Decorative pockets add beauty to apparel. There are various types of pockets used in girls, boys, men and women garments. A pocket can be stitched like a patch, attached in a seam or made by altering a slit on a garment and sewn.

Types of Pockets – The most common types of pockets are patch pockets, inseam pockets and slash pockets.

Patch Pockets -A patch pocket is a basic pocket that is sewed on to a garment like a patch. Patch pocket has an opening on the top. This pocket is very common on men's shirts. For kids garment, the pocket can be stitched in shapes of square or triangle or as cartoon motifs. Laces, piping, embroidery can also be used for decorative purposes. It's also possible to make it out of decorative textiles. It can be stitched with lining cloth or without lining. A lining is needed for fabrics that stretch or sag. Fabrics that are firm enough to hold their shape can be stitched without lining, (Figure 11.26).

Figure 11.26 Patch Pocket

Figure11.27 Inseam Pocket

Inseam Pocket -In seam pockets are sewn along the side seams of the garment. These pockets are made on the left side of the garment. Boy's shorts, girl's pants, pyjamas, and kurtas all have these pockets sewed in. It can be cut as part of the garment front and back or it can be cut from a separate pattern piece and stitched to the seam. If the outer fabric is bulky or heavy, the pocket pieces can be cut from lining fabric, (Figure 11.27).

Slash Pocket - Slash pocket is a pocket suspended on the wrong side of the garment. On the right side of the garment, a finished slit can be seen. It serves as

Figure11.28 Slash Pocket

XI_EM_TDD_CHAP11_2022.indd 125 24-01-2023 13:35:14

pocket opening. There are three types of slash pockets namely, bound pocket, welt pocket and flap pocket, (Figure11.28).

Why small pocket are constructed in jean pants?

Today a jean is a unisex will woven pant used across the globe. In the 1800s, it was a work pant for cowboys .They used to wear their watches in their chains, which was likely to break, hence small pockets were developed. With this reference Levis introduced small pockets in the jean pants to keep watches.

11.10 YOKES

Yoke is one segment of the garment that can be constructed on the garment. It can be seen in the garment of children, men and women. It is introduced in a garment based on the need and to hold the gathers. For decorative purpose, it is sewn at shoulder, upper and lower part of the hip. Yokes can be constructed with different structures, variations like 'V'shape, oval shape or with different colour according to ones taste and need of the person.

Types of yokes:

Yokes are classified based upon the pattern made and decorations as plain or basic yoke and decorative yoke.

Plain/Basic Yoke - Plain or basic yoke has got simple structure. It can be placed in front or back part of men's shirt. According to the shape of garment, use of garment, age of person, yokes are suitably cut and sewn. The yoke part can be attached with a piping or seam. Example: Bodice block can be cut across to form the plain / basic yoke, (Figure 11.29).

Figure 11.29 Plain/Basic Yoke

Decorative Yoke- Contrast colour materials can be used for making yoke. Use of various tucks, pleats and frills add interest to the garment. According to the wish of wearer, piping or frills can be stitched at the edges of the yoke.

Yoke can be joined using plain fabric or by adding one or more layers for stiffness. For skirts, yoke is cut to the shape of the waist line. After that, the skirt is gathered and sewn to the yoke. The bottom of the yoke should match to the size of the gathering in the skirt.

To construct yokes with curved edges on panel skirt, lapped seam can be used. These kinds of yoke can be used on the bodice part of kid's front, upper part of night dresses and on the waist bands of skirts. Yokes of desired shape can be cut and stitched and decorations using embroideries, (Figure 11.30).

XI_EM_TDD_CHAP11_2022.indd 126 24-01-2023 13:35:14

Figure 11.30 Decorative Yoke

11.11 FLAT SKETCHING

A flat sketch is a two-dimensional technical drawing. This illustrates a garment with basic solid lines. A flat sketch, also called flat drawing and technical flat in the fashion industry. It is a technical drawing of a garment. Design details like seams and stitching lines are marked. It acts as a guide for drafting the pattern design, this helps both the designer and the pattern maker throughout the garment-making process.

11.12 SUMMARY

Every one likes to look unique from each other. This can be obtained by garment selection and addition of suitable garment components. The most important garment components are neckline, collars, sleeves, plackets and yokes. Each of these components can be varied to create a wide range of garments. A clear knowledge about these components and their application will help one to become a creative garment designer.

POINTS TO REMEMBER

- Round collar/peter pan collar are usually used in kid's and women's garments
- Plackets help in easy wearing and removing the garments.
- Skirts are garments used in the lower part of the body.
- Pockets helps one to carry small personal belongings
- Yokes are a segment of garment.

ACTIVITIES FOR THE TEACHER

- Collect garment components pictures and display in the class notice board to create interest in dress designing.
- To show application of garment details using powerpoint

ACTIVITIES FOR STUDENTS

- Prepare paper pattern for various garment details.
- Collect pictures to show the application of garment details.

XI_EM_TDD_CHAP11_2022.indd 127 24-01-2023 13:35:15

GLOSSARY

1	Bias	Diagonal line at 45° of warp and weft yarn.
2	Sleeve cap	Top edges of the sleeve.
3	Hemline	Bottom edge of the any garment.
4	Piping	Used to finish raw edges.
5	Neckline	Part of bodice pattern around the neck
6	Waist Band	Means of finishing the raw edges of skirt.
7	Yoke	Shaped panel used for functional (or) decorative purpose.

QUESTIONS AND ANSWERS

PART – I
Objective Questions

1. Gathered sleeve is mostly used in_____

   a) Kurta b) Shirts
   c) Dresses d) Sportswear

2. Scoop neckline resemble the shape of a

   a) Square b) Heart
   c) Pot d) Wedge

3. Which one of the following is used to finish the neckline because of its stretchability?

   a) Braided cords b) Knitted fabric
   c) Bias strip d) Lace

4. A good placket should be as _____as possible

   (a) Bulky (b) Flat
   (c) Curved (d) Loose

5. This sleeve has no seam at the armhole or at the shoulder

   a) Kimono b) Gathered
   c) B e l l d) Plain

PART – II
Answer In Three (Or) Four Points

1. Explain round neckline and name some of its variations.
2. Write short notes on zipper placket
3. Describe pleated skirt.
4. Differentiate patch and slash pocket
5. List 5 methods of creating decorative yoke.

PART – III
Answer in a Paragraph

1. Differentiate between flared skirt and pleated skirt.
2. What is a kimono sleeve?Explain.
3. Explain miter placket.

PART – IV
Answer in one Page

1. Explain the different types of sleeve.
2. Describe two types of yokes with diagrams.

Answers for Objective Questions

1. (c) 2. (d) 3. (c) 4. (b) 5. (a)

XI_EM_TDD_CHAP11_2022.indd 128 24-01-2023 13:35:15

CHAPTER

12

GARMENT DECORATION AND EMBELLISHMENT

LEARNING OBJECTIVES

- To understand the concept of garment decorating and embellishment.
- To acquire skills in making various decorations and embellishments on garments.

12.1 INTRODUCTION

Decoration and Embellishments add enrichment to any type of clothing. Decoration increase beauty to garments and it gives a special touch to a costume. Based on the use of the garment, decoration and embellishments may vary. Decorations can create an interesting effect on a plain garment. Decoration helps to create variety in a garment. It is important to choose a suitable decoration based on design of the fabric and style of the garment.

12.2 PRINCIPLES TO BE FOLLOWED WHILE PLANNING A DECORATION OR EMBELLISHMENTS

- It should be stitched in structural point to strengthen the shape of the garment.
- Decoration and embellishments should cover the entire garment evenly, to create balance in the garment.
- It must suit the fabric and colour of the garment.
- There must be enough background space.
- The decorations or embellishments used should give grace and dignity to the garment.
- The quality and life of the decoration and embellishments should be ensured.
- Stylized designs add interest to the garment when compared to a naturalistic design.

12.3 FASTENERS AND TYPES OF FASTNERS

Items which are used to close the garment opening are called fasteners. They are used for decorative as well as functional purpose. While selecting the fasteners care should be taken to see that they are rust free and durable during laundering. Depending on the colours, design, texture and purpose, fasteners are to be used.

XI_EM_TDD_CHAP12_2022.indd 129 24-01-2023 13:38:56

Types of Fasteners

Press Button

Press buttons are available in different sizes and weights and are used to hold edges that will not have much strain when the garment is worn. It has two sections: a stud and a socket. The stud is attached on the wrong side of the overlap and the socket comes over its impression on the underside of the placket. The press buttons have four holes into which buttonhole stitches are made to hold them firmly to the garment. This is best suited for kids garments, (Figure 12.1).

Figure 12.1 Press Button

Hook and Eyes/Loops

Hook and Eye / loops are generally used in plackets where there is more stress. Hooks and eyes are used mostly in close fitting garments like blouse. They also available in different size, but circular in shape and is made out of metals. Hooks are metals with curved structure at the top with two parallel lines and finished with two circles at the bottom. Button hole stitches are made at the circles placing the hook on the garment to fix the hook onto the garment, (Figure 12.2).

Figure 12.2 Hook and Eyes/Loops

Buttons and Button Holes

Buttons are both functional as well as decorative. They should be selected with care to suit the colour, design and texture of the fabric and style of the garment. Decorative buttons vary in the form of glass, metal and plastic. Buttons have two or four holes, (Figure 12.3).

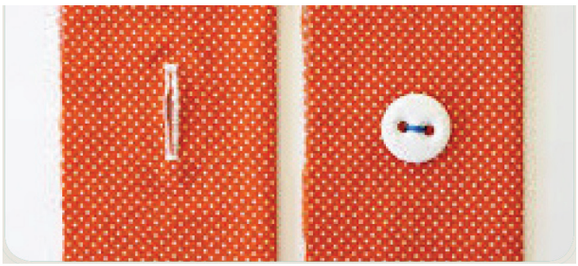

Figure 12.3 Button Hole and Button

Zippers

One can find zipper in different colours, length, and shapes. Zippers have a chain of metal, plastic teeth or even synthetic coil attached to a tape of fabric that is made of cotton, cotton blends or polyester blends, (Figure 12.4). It has a stopper at the top or bottom which keep the slider from running off the zipper. The three types of zippers are as follows:

- **Conventional Zipper:** These zippers are held together at the bottom and have exposed of open chain at the top.
- **Separating Zipper:** These zippers can be fully open as like zipper in jerkins. They can be opened both at the top and bottom.
- **Invisible Zipper:** Unlike other zipper these are new and cannot be seen as they vanish into the seam. Mostly in skirts and kurtis these zippers are used.

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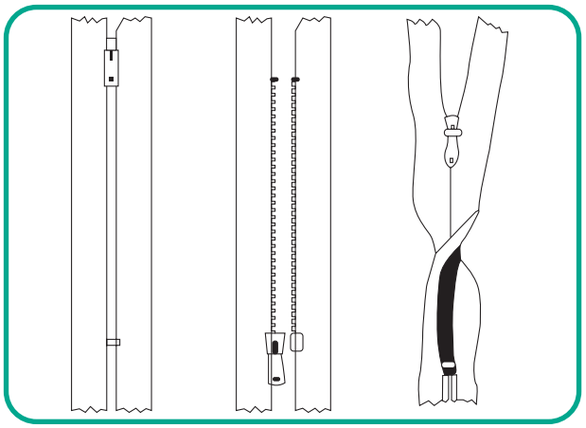


Figure 12.4 Zippers

Elastics

Elastics are preferred at the places where stretching is needed. While selecting elastic care should be taken to choose them according to the end use, type and durability of the garment. It is usually cased between the fabric or can be directly stitched onto the garment, (Figure 12.5).

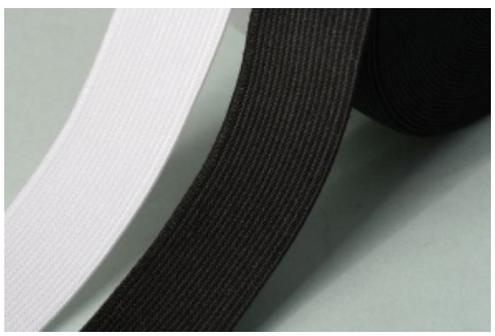


Figure 12.5 Elastics

Tapes and Cords

Tapes and cords serves both decorative and functional purpose. There are different types available with varied colours, shapes and width. Usually it is selected depending upon the end use.

Velcro

A set of two napped surfaced, one with loops and other with hooks is called a Velcro. The two napped surface are pressed down so that all the loops interlocks with the hook until they are pulled apart. Nylon velcros are used widely and are sold in meters. They are used for cuff joining, bags, plackets and other home textile products, (Figure12.6).

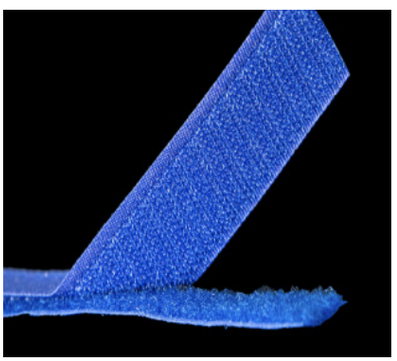
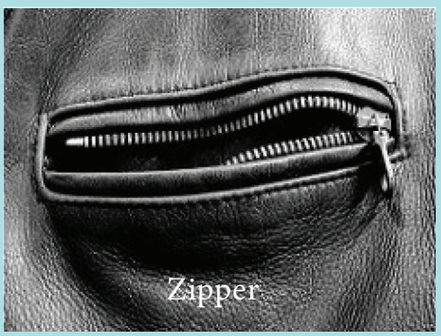


Figure12.6 Velcro

When were Zippers invented?

Zippers were invented in 1893 to speed up the process of buttoning shoes and boots, and they were soon adapted to pants and skirts.



Buckles

Figure 12.7 Buckle

Among the different types of fasteners buckles are very interesting type. They are made up of metals and plastics. There are wide varieties of buckles available in the market, (Figure 12.7).

XI_EM_TDD_CHAP12_2022.indd 131 24-01-2023 13:38:57

12.4 CLASSIFICATION OF DECORATION AND EMBELLISHMENT

Decoration and embellishments are classified based on the raw materials used and type of work done. A basic classification is shown in the flow chart below;

What is Tombac Buttons?

Tombac is a brass alloy with 5-20% of copper and zinc content used for ornament and as decorative buttons. Tin and lead can be added to get colorful buttons.

Fabric Decorations

Fabric decorations are items made out of textile materials and attached to the garment. They are stitched at the edges or specific areas of the garments to enhance its look.

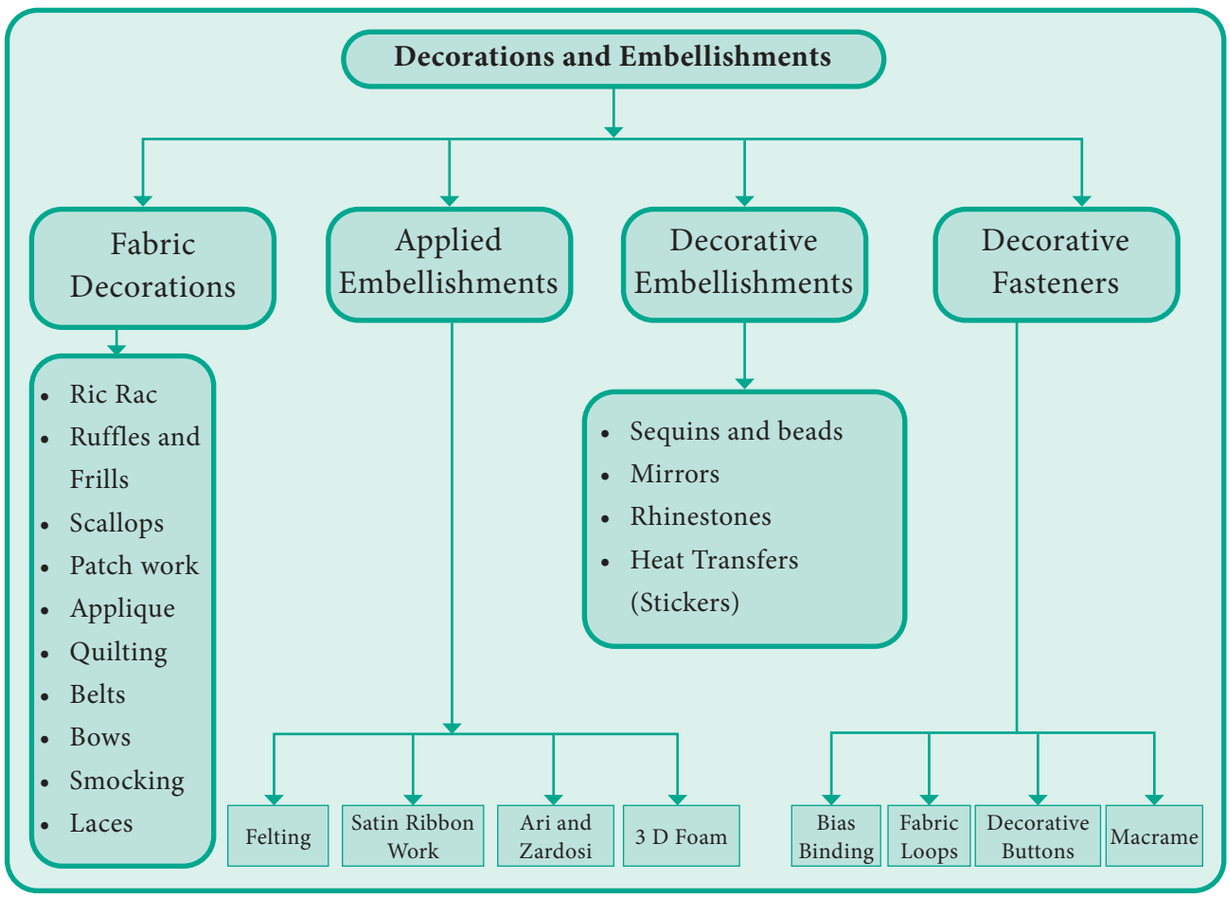
Some of the common fabric decorations are discussed below:

Ric Rac

It is a zig zag narrow embellishment used for adornment. It is available in different colour and it is cost efficient. It can be used as a motif or can be sewn flat on a garment. They are made of different material like cotton, nylon and polyester, (Figure 12.8).

Ruffles and Frills

Ruffles are a piece of fabric pleated or gathered on edges to release fullness. It can be used for decoration as well as for finishing raw edges, (Figure12.9).



XI_EM_TDD_CHAP12_2022.indd 132 24-01-2023 13:38:57

Figure 12.8 Ric Rac

Figure 12.9 Ruffles and Frills

Frills can be added along the hem of a garment or inserted in seam or any section.

Scallops

Scallops are one of the easiest ways to decorate a garment. They should be spaced evenly. These are mostly done on straight edge. Scallops can be done on necklines and edges of a garment to add beauty to a garment, (Figure12.10).

Figure 12.10 Scallops

Patch Work

A piece of fabric with or without embellishment is attached on garment for a decorative purpose is called as patches. These can be done either by hand or machine. For hand patch work, loop stitch can be used. Patch work is used in clothes, table cover, and sofa cover and in children garments, (Figure 12.11).

XI_EM_TDD_CHAP12_2022.indd 133 24-01-2023 13:38:57

Figure 12.11 Patch Work

Figure 12.12 Applique

Applique

Applique is the method of attaching a contrasting material on a large back ground. Appliqué can be trimmed after stitching. Appliqué may vary in pattern, colour and texture. It can be done by hand or machine, (Figure12.12).

Quilting

Quilting is technique of giving a textured look to the garment. It adds weight and warmth. Generally, geometrical designs are seen in quilting. Quilting is done on running fabric before cutting the pattern, (Figure 12.13). Foam is placed between the fabrics to create quilted effect.

Figure 12.13 Quilting

Belts

Belt is an important fashion accessory. It can be used as a design feature or it can act as a main focal point in a design. It can give the whole design a delicate effect, (Figure 12.14).

Figure 12.14 Belts

The different types of fasteners used with belts are hooks, buckles, claps, ties and studs.

Bows

Bows are used as fasteners or it can also be used as decorative feature in a garment. Bows made from taffeta, cotton, linen produce a sharp and crisp look. A bow can

XI_EM_TDD_CHAP12_2022.indd 134 24-01-2023 13:38:57

be stitched at neckline, waist line or it can be tied at the back to give an interesting effect, (Figure12.15).

Figure 12.15 Bows

Smocking

Smocking is an embellishment in which embroidery is done over a gathered edge for decorative purposes. It is used in children garment, near yokes, sleeves, waistline and neckline of a garment, (Figure 12.16).

Figure 12.16 Smocking

Laces

Laces can be used at edge to increase length or to decorate a garment. Decorative lace can be made by hand, machine, crochet needle and tatting. Laces made from crochet needle can be attached on the edge of the garments. Decorative laces are used in frocks, hoods, saris, shawls and skirts, (Figure12.17).

Figure 12.17 Laces

Applied Embellishments

Applied embellishment is a decoration in which the garment fabric is modified or used as a base to work the required decoration. Some of the common types of applied embellishments are explained below:

Felting

Felt is a non - woven fabric. It is made by compressing fibres together by application of heat till they form a solid fabric. Wool, synthetic and cotton fibre can be compressed to form felt fibre. Special kind of needles is used for felting, (Figure 12.18).

Figure 12.18 Felting

XI_EM_TDD_CHAP12_2022.indd 135 24-01-2023 13:38:57

Satin Ribbon

Satin ribbons are long thin strips of woven fabrics. It is used to develop beautiful motifs. It can be used for wedding gowns as well as for craft work, (Figure 12.19).

Figure 12.19 Satin Ribbon

Aari and Zardosi Work

Aari work or aari embroidery is embroidery done along with the help of a hook. Silk thread and metal wires are used. Zardosi embroidery is a decorative metallic embroidery work done by using thin wire threads with circular and spiral shaped metallic pieces. Gold and silver colours threads are used, (Figure 12.20).

Figure12.20 Aari and Zardosi work

3D Foam

3D foam embroidery is a special technique, with digitalizing process. Foam is introduced in specific areas. For Example, a letter or flower motif in a design. It is then stitched by machine. The stitches enter the foam and lock the foam into the required fabric, (Figure12.21).

Figure 12.21 3D Form

Decorative Embellishments

Decorative embellishments are small items which are placed on the garment and stitched. They include the following:

Sequins and Beads

Sequins are flat circular objects made to reflect light and can be arranged in different ways depending upon the effect desired. These can be used in borders or can be scattered all over the garment.

Beads are used to add beauty to a fabric. Beads are made of metal, plastic or wood. They are available in different shapes and sizes. They have a hole in the center to sew it to the garment, (Figure12.22).

XI_EM_TDD_CHAP12_2022.indd 136 24-01-2023 13:38:57

Figure 12.22 Sequins and Beads

Mirrors

Mirrors are available as small metals, similar to real looking glasses. The metal mirrors have small holes at the edges which enable them to stitch to the garment, (Figure12.23).

Figure12.23 Mirrors

Rhinestones

Rhinestones are flat diamond like sparkling beads from rock crystal found on the river side. They come in different shapes, colour and size. They can be easily sewed or glued to the fabric. They can enhance the appearance of a plain outfit, (Figure12.24).

Figure12.24 Rhinestones

Heat Transfers (Stickers)

Heat transfers are commonly known as stickers. To prepare heat transfers, the design is first created on a special paper. And then paper design is placed on the garment and steam pressed. Heat from the iron box transfers the design to the garment. The most common heat transfer designs are numbers and names. Cartoon motifs are also used for children's wear, (Figure12.25).

Figure 12.25 Heat Transfer Stickers

Decorative Fasteners

Decorative fasteners increase the look, convenience and comfort of a garment when selected properly. They can be used for decorative purposes. They are made with metal, wood, plain fabric or leather. Decorative fasteners enhance

XI_EM_TDD_CHAP12_2022.indd 137 24-01-2023 13:38:57

the appearance of any garment. Buttons, stud, snaps, hook and eye, zippers, buckles, velcro, frogging, grommets, magnet brooches are the common type of decorative fasteners used. Some of the decorative fasteners are described below;

Bias Binding

Bias bindings are strips cut on bias in contrasting materials or any material to finish raw edge in any garment. These can be used in place of bias facing while making decorative edges.

Fabric Loops

Fabric loops are cylindrical strips of fabric. Generally, they are stitched to match the garment. These are used as straps for shoulder and can also be used as loops for fastening button in a garment instead of zipper opening, (Figure 12.26).

Figure 12.26 Fabric Loops

Decorative Buttons

The market is filled with various types of decorative buttons. They vary in size, shape, colour and raw materials used. Depending upon the type of garments they should be selected. They are mainly used for decoration and do not have the common function of fastening the garment, (Figure12.27).

Figure 12.27 Decorative Buttons

Macrame

Macrame is a method of tying cords into knots to form different shapes. It produces a textured effect. It is used as tassels and fringes. Beads can be added at the end. The thickness of cord can be varied to create embossed effect. Variations can be created by using different colour. They can be easily made and are affordable. Half knot and square knot are the common knots used for macramé. They are mainly attached at the edges of the garment to hold them together. Belts and garment strips are made in this method, (Figure12.28).

Figure 12.28 Macrame

XI_EM_TDD_CHAP12_2022.indd 138 24-01-2023 13:38:57

12.5 SUMMARY

Decoration when positioned properly adds interest to garment. Great care should be taken while choosing embellishments. Various decorations that can be used are ric rac, embroidery, ruffles, frills, beads, sequins and macrame. A combination of two or three types of decorations can also be added to single dress. This shows the creativity of the designer.

POINTS TO REMEMBER

- Two or more decorations can be combined for a single garments enhancement.
- Decoration may vary depending on the type of garment, age and sex of the wearer, type of usage and individuals preference.
- Each decoration has its own method of sewing.
- Buckles are generally used with belts.

ACTIVITIES FOR THE TEACHER

- To give power point presentation of different decoration.
- To demonstrate the use of decoration on different fabric types.
- To download and show the construction of decoration through YouTube.

ACTIVITIES FOR STUDENTS

- To collect different decoration items such as buttons, laces, ribbons, bows, ric rac, laces, embroidered laces, printed laces, plain laces, crochet laces and embroidered panels and prepare a 'Embellishment Album'.
- Draw two garments with any type of decoration on it.

GLOSSARY

1.	Ric rac	Zig zag ribbon used for decorating a garment.
2.	Applique	Ornamental needle work in which a small piece of fabric is sewn or stuck onto a large background to form a pattern.
3.	Smocking	Embroidery techniques to gather fabric.
4.	Scallops	Continuous curves along the edges of a fabric.
5.	Lingerie	Women's innerwear and night clothes.
6.	Macrame	A decorative fabric made by knotting cords.
7.	Rhinestones	An imitation diamond used for decoration.
8.	Patch work	A piece of fabric attached together for decorative purpose.

XI_EM_TDD_CHAP12_2022.indd 139 24-01-2023 13:38:57

INTERNET RESOURCES

https://www.youtube.com/watch?v=rPp6Nn4mmYk	How to sew Shirring?
https://www.youtube.com/watch?v=0VwYHenyvhs	How to Gather Fabric?

QUESTIONS AND ANSWERS

PART – I
Objective Questions:

1. An embroidering over gathered edge is called

   (a) Smocking

   (b) Lace

   (c) Applique

   (d) Ric Rac

2. ---------- form rhythmical edge on a plain fabric

   (a) Scallops

   (b) Rhinestone

   (c) Macrame

   (d) Bows

3. Rhinestones are crystals found near ----------

   (a) River sides

   (b) Mountain

   (c) Sea

   (d) Forest

4. ---------- are flat and reflect light.

   (a) Bows (b) Sequins

   (c) Ruffles (d) Applique

5. ---------- is used in place of bias tubing.

   (a) Sequins

   (b) Bows

   (c) Rhinestone

   (d) Bias embellishments

6 .---------- are used mostly in close fitting garments like blouse.

   (a) Zippers

   (b) Hook and Eye

   (c) Velcro

   (d) Tape and Cord

7. ---------- is a set of two tapes one with a looped napped surface and other with a hooked napped surface.

   (a) Velcro

   (b) Hook and Eye

   (c) Tape and Cord

   (d) Zippers

PART – II
Answer In Three (Or) Four Points:

1. What is ric rac?
2. Describe smocking
3. Explain decorative fasteners.

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4. List the uses of felting
5. What is macrame?
6. Define zippers and its types.

PART – III

Answer in a Paragraph

1. Write a short note on ruffles and frills.
2. Brief on patchwork.
3. Describe fabric loops.
4. Explain Velcro

PART – IV

Answer in one Page:

1. Discuss in detail about any five decorations on garments.
2. Explain any five types of fasteners.

Answers for Objective Questions

1. **(a)** 2. **(a)** 3. **(a)** 4. **(b)**
5. **(d)** 6. **(b)** 7. **(a)**

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CHAPTER

13 HEALTH AND SAFETY MEASURES IN APPAREL INDUSTRY

LEARNING OBJECTIVES

- To learn the health and safety measures, procedures and practices followed in garment industry.
- To understand the rights and responsibilities of employees and employer
- To gain the knowledge about risk and hazards in working environment and concepts of ergonomic designs in apparel industry

13.1 INTRODUCTION

Health and safety measures in any industry is a multidisciplinary practice dealing with all aspects of hygiene and well-being at the workplace. Its main objectives are preventing workplace hazards, ensuring a safe and healthy working environment and practicing professional approach on maintaining industrial hygiene at workplaces.

Unlike many industries, garment making companies do not deal with toxic / hazards / high temperature working conditions. However, setting a unit in greenery, spacing of machineries, safety protocols, basic sanitation, proper lighting and ventilation fulfill the industrial requirements for proper functioning.

13.2 RIGHTS AND DUTIES

In any industry there are different rules, government policies to protect the employee and employer rights and basic needs.Apart both have specific duties to achieve the production target.

Rights and Duties of Employees:

Workers, employers and governments must make sure that these rights are protected and must try to create and retain decent working situations and working environment. More exactly:

- Work should occur in a safe and healthy operational environment;
- Workers health, well-being and human esteem to be reliable and in good condition
- Work should provide real prospects for self- fulfillment, service to society and personal achievement

While at work, employees must take care of their own safety and the safety of co-workers who can be affected by their action of movements or errors. They must

cooperate with their employer to meet the terms with the Act and regulations. An employee must not misuse facilities at the workplace against welfare, health and safety aspects.

Employer Duties and Responsibilities:

Training is one of the mandatory tasks to be supported by employers. Workers requirements and its relevance to protect their lives and health of their co-workers at working place must also be considered.

- Initiate training and information programs on prevention and control of hazards, protection against risks, accidents and emergencies.
- Provide first-aid facilities, adequate arrangements, compensation for work related injuries and diseases and rehabilitation facilities for prompt return of employee.
- Providing all necessary safety equipment details and its performance details to the required work - this may include ear protectors, goggles, protective clothing, footwear, gloves and masks.
- Care on all equipment, machineries and ensuring its conformity to safety standards.
- Setting amenities for airflow and ventilation required at workplace.

13.3 IMPORTANCE OF SAFETY MEASURES:

- A safe and healthy workplace not only protects workers from injury and illness, it lowers down the injury/ illness costs, reduces absenteeism and improves turnover. In turn, it increases the productivity and quality and raise employee morale.
- It ensures keen concern on workers return back home safe and healthy at the end of every working day.
- Workers are more productive in workplaces if their health and safety is ensured.
- It reduces the time take by an individual to return back to job after some illness and accidents. (Down-time)
- If the rules and safety measures are not followed properly, legal gaps may lead to inspection, penalties and even imprisonment of senior executives.
- Commitment by the industry towards sustainability and corporate social responsibility attracts investors and partners.
- Ethical practices and safety performance creates reputation to the brand.

13.4 TOOLS AND EQUIPMENT USED AS SAFETY MEASURES

Safety Measures in Cutting Section

- Metal mesh gloves to be used to protect oneself from cutting equipment, (Figure 13.1).
- Using dust masks and face mask will prevent employers getting affected from polluted air, (Figure 13.2).
- Wearing safety shoes and gloves will protect the operator from electrical shocks.
- Cutting knifes with adjustable speed mechanism should be used.

Figure 13.1 Metal Mesh Gloves

Figure 13.2 Face Mask

Figure 13.3 Electrical Saws

- Compressed pressure foots for easy hand movement of knives
- Adjustable working table height to be used in die cutting operation.
- Use of perforated tables will avoid fabric slippage

Figure 13.4 Mobile Wheel Carts

Figure 13.5 Hanging -Rails on Wheels

Figure 13.6 High Protected Glasses and Light with Goose Neck

- Adjustable pressure in electrical saws to prevent heavy vibrations, (Figure 13.3).
- Automatic stop buttons mechanism to be used in all kinds of equipment and machineries to prevent accidents.

Safety measures in Sewing Section

- Use pick-up trays to be used to carry garment bundles in the production line.
- Use mobile wheel carts for transportation of material in the workstation, (Figure 13.4).
- Use hanging-rails on wheels to avoid wrinkling of finished garments, (Figure 13.5).
- Needle guards must be well maintained and replaced regularly.
- Use eye protection devices like glasses, goggles, face shields and visors.
- Lights with goose necks, (Figure 13.6) in sewing machine can be used for high visibility, (Figure 13.6).
- Use adequate lighting to avoid glairiness

Safety measure in Dyeing and Printing Section

- Wear Personnel protective equipment (PPE) to prevent getting affected from dyes and chemicals.
- Make assure that (PPE) is in right condition. Old ones to be replaced if worn out or if it expires from the mentioned warranty period.
- Wear boots, safety masks, aprons, gloves and goggles.
- Follow good safety practices while handling machineries.
- Maintaining equipments and machineries in good condition and ensuring reliability is a required safety aspect.
- Crucial emergency elements like emergency lights, alarms, gathering areas and evacuation plans are required to ensure worker safety.
- Maintaining accident records to note down the causes and reason for accidents is mandatory and it also helps on tracking insurance claiming and its resolutions.

Safety measures in Pressing and Boiler Section

- Boiler section to be functioning with adequate service men to attend emergency safety calls for workers.
- Automatic indicator mechanism to be used to alarm on fluctuating pressures on boilers.
- Boiler section to function with sufficient ventilation.

Possible accidents in the cutting room may include -

- Fatal injury while improper handling of cutting equipment like in straight knife, round knife or band knife.
- Breathing problem like suffocation in the department due to flying lint.
- Improper handling of fabric roll can lead to muscular injury.

https://www.onlineclothingstudy.com/2020/03/factory-safety-what-could-go-wrong.html

13.5 RISK AND RISK FACTORS OF HAZARDS

Apparel industry work place have hazard potential risks and associate risk factors. It will harm the workers and surrounding people if it is not properly handle or misused. A proper trained personnel and standard operating procedure will reduce the risk level.

Hazard: something that could potentially cause harm – Toxic chemicals

Risk: the degree of likelihood that harm will be caused – Operating open soft flow machine

Risk factor: It is used to indicate a factor that is associated with a given outcome. It also includes proxies caused due to high temperature, pressure or electrical circuits at wet area

Risk Factors

The common risk factors faced in a Textile and garment industry are listed below.

- Biological risk factors - Anything which affects the function and behavior of a living organism.
- Chemical risk factors - the risk caused by a chemical depends on two factors: The inherent toxicity of the chemical (hazard); How much of a chemical is present in an environmental intermediate (e.g., soil, water and air) exposure level to a handling person or ecological receptor effects with the chemical elements.
- Physical risk factors - physical risk factors encompass everything that can be touched or felt. This can be in the form of huge size, radiation, screws, glass etc.
- Psychosocial, personal and other risk factors - Things that may affect worker's psychological response to their work and workplace conditions (including working relationships with supervisors and colleagues).

Risk Assessment and Management

It is a term used to describe the overall process or method to identify the hazards and risk factors that has the potential to cause harm (hazard identification). Risk assessment is an inspection process at workplace to identify hazard - things, situations, processes, that may cause harm, particularly to people. After identification, adequate safety measures should be adopted in that place to effectively eliminate or control the harm from happening.

Risk management plan will be effective, when it has the participation of everyone present in the organization, each and every individual knowing their roles, responsibility and accountability. It requires the establishment of policies, procedures with resources and tools. Training level, testing standards and observations are essential in planning.

DO YOU KNOW?

Some of the major accidents in garment Industry

Major Hazards in the Workplace:

The major hazards in the textile and garment industry are listed below

- Falls and Falling Objects – Garment bundles from multistory building
- Chemical Exposure – chemicals in processing treatment that causes that hazards
- Fire Hazards – Overheating, human error, atmospheric conditions and machine failures

- Electrical Hazards – Short circuit, poor connection of electrical machines
- Repetitive Motion Injury – Overtime workload, same job operation for long hours.

13.6 ERGONOMICS

Ergonomics is the study relevant to applied science for equipment design and workplace design, proposed to improve productivity by decreasing operator fatigue and discomfort. Many industries design work spaces around the needs of the average staff member. For example, a sewing machine table may be set at a height for a person who is 5 foot 7 inches. For an operator who is 6 foot 4 inches the desk may be too low, causing back pain.

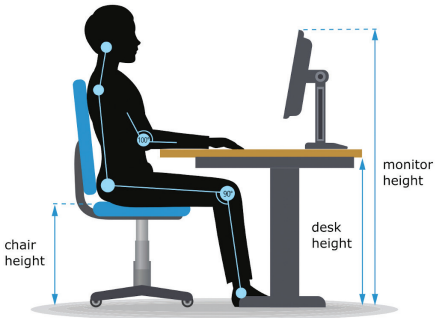

Figure 13.7 Right combination of seat and table height is essential for correct posture. Operators typically adopt curved posture resulting in discomfort in the back and neck.

- Tool design – It includes furniture like tables and chairs
- Equipment design – The design of equipment including sewing, cutting, and ironing.
- Job/task design – Many jobs have different tasks that needs to be performed for its completion. Some jobs need more physical movements and high risk; some requires low movements with low risk.
- Work station design – It relates to work area and its instantaneous environment, includes closeness of co-workers, people, lighting level, air flow and ventilation.

Importance of Ergonomics

- Ergonomics raises the efficiency and production or business system and progresses towards health, safety and comfort of a human in work place.
- Facilitating correct body posture and using different productivity models and application of ergonomics reduces the absenteeism of workers and it improves the productivity.
- Makes employees more comfortable in workplace and it enhances product quality.
- Use of binders and hemmers reduces finger manipulation job of an operator in many operations like hemming, neck binding and pin tucking, Ergonomically designed scissors will help the workers to do the work comfortable for a long run.
- As per international standard, nearly 60-95% of operation processes are common for product categories like trouser, shirt; jogging suite and are repetitive in work nature. A significant association occurs concerning to hand pain and repetitive work rates.

Ergonomic-Layout Planning

A proper ergonomic design of each workplace along with suitable methods with appropriate time standards ensures a much better structure of technological operations. A sewing section design layout given in Figure 13.8

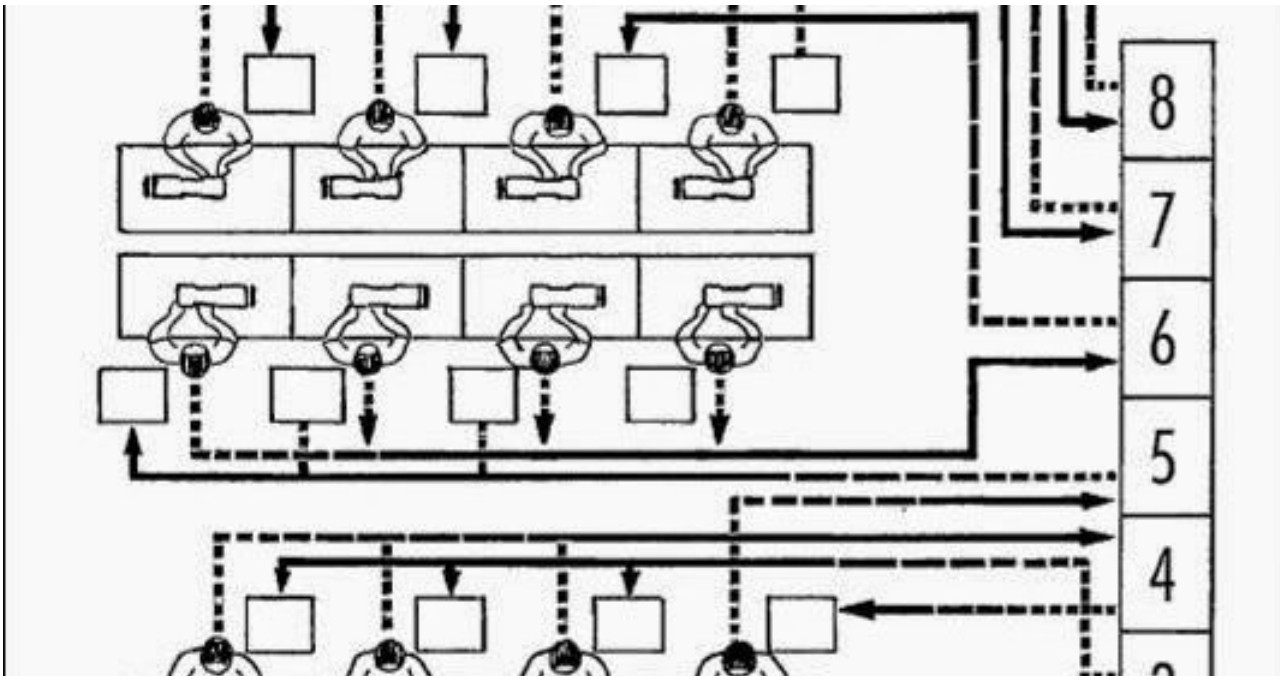

Figure13.8 Ergonomic layout

A. Ergonomic Principles in Designing a Workplace

- The designing of the workroom should be based on work nature, that it will be either in sitting or standing posture.
- Work table heights need to be considered for standing work or it can be changed as per obligation.
- Workplace should have sufficient space for the operative to stretch legs contentedly in their workplace.
- Personnel have differences in height, hence to perform the operation at most suitable posture either in sitting or standing or height of the table or chair can be adjustable.

B. Ergonomic Principles in Designing at Working Processes

- While executing the job operation the posture and energy spent by an operator should be in low level to complete the task
- The task should be planned for stress-free and natural duplications or repetitions.
- At the time of higher force required on hand or movements standing posture will be preferred. Examples cutting, quality checking pressing.
- The operators can free his/her hands from the work at any time possible while attending tools or machines operated by a foot.
- Workplaces need to be designed according to operation process with proper lighting for clean line of sight. Example - A sewing worktable placed with satisfactory sitting posture, sitting chair includes the slight bent on upper part of the back and allows for easy rotation of the body upon condition and least possible of eye rotation while sewing. This reaches higher visual precision and good for operation management.

- The work space near by the operator should be standardized in such a way that along with visual sharpness, the operator can perform a real-time movement of legs, hands, and torso.

C. Ergonomic Principles in Handling Material and Tools

- Garment components and accessories should be placed in one place or near place in a way that ensure minimum movement by the operator in rescuing pieces enables saving of time.
- Operator to avoid movement for tools, material pieces required in operation process. They should be positioned close to the operation table Example to avoid bending movement of body on collecting pieces or dispatching process.
- Recommendation of limit of forces and procedures to be followed while executing the lifting operations under suitable conditions. For permanent lifting operations, the allowed load limit is 176N for men &98N for women. Similarly, for occasional lifting, it is 490N for men and 294N for women. This is important to carry fabrics especially while taking fabric to the cutting table.

D. Ergonomic Principles in Designing Environment

- Utilization of daylight or artificial illumination should prevent glare and type of illumination must prevent strain on eyes.
- Different kinds of operation require different intensity lights proper intensity, type of illumination, spreads will be different for various operations. Still checking operations or quality evaluation requires a high level of lighting facilities.

13.7 SUMMARY

Safety and health measures play an important role in industry. It is essential that the workers be aware of various occupational hazards in the apparel industry. The major health and safety problems are due to exposure of chemicals, exposure of fabric dust, exposure of noise, biological hazard, psychosocial hazard and ergonomic issues. Hence, it is mandatory for the management to train their employees. Practice them to follow standard operating procedures and use proper safety wears in all the processes to protect workers from potential hazardous situations.

POINTS TO REMEMBER

- Training is one of the most important tasks to be carried out by the employers to the employees.
- A safe and healthy workplace not only protects workers from injury and illness, it lowers down the injury/illness costs, reduces absenteeism and improves turnover.
- Ergonomics helps the workers to attain higher productivity due to less fatigue, safer working environment (fewer accidents), lesser absenteeism and reduced labor turnover.

- By protecting workers, reduced absenteeism, ensuring workplace safety gives more efficient production.
- Strong corporate responsibility and sustainability practices retain the best employees.
- Ergonomics increases the efficiency and productivity of production or business system and improves health, safety and comfort of a man in a working place

ACTIVITIES FOR THE TEACHER

- Show a video of an apparel industry and highlight the safety measures

ACTIVITIES FOR STUDENTS

- Visit a nearby apparel industry and list out the hazard potentials.

GLOSSARY

1	Environment	A surrounding place
2	Ethical activities	Moral acts
3	Perforated tables	A tables with sucking air system to hold fabric
4	Assessment	Inspection
5	Hazard	A danger or risk
6	Standards	A level of quality
7	Ergonomic	Efficient designing
8	Factors	Contributes to a result

INTERNET RESOURCES

https://youtu.be/vMknBsbcR60	Work Place Safety in Garment Industry
https://youtu.be/5JFoIASTmiM	Importance of Workplace Safety Training
https://youtu.be/_fpRmqQ9uj8	Safety Culture
https://youtu.be/vMknBsbcR60	Work Place Safety in Garment Industry

QUESTIONS AND ANSWERS

PART – I
Objective Questions:

1. Occupational safety and health is a _____ practice dealing with all aspects of health and safety in the workplace.
   a) Engineering
   b) Multidisciplinary
   c) Science
   d) Art

2. _____ practices and safety performance creates reputation to the brand
   a) Good b) Fair
   c) Ethical d) Poor

3. Provide _____ gloves to workers using cutting equipment to protect them from finger injuries
   a) Metal mesh b) Rubber
   c) Cloth d) PP

4. _____ is something that could potentially cause harm.
   a) Risk b) Risk factor
   c) Wrong practices d) Hazard

5. _____ risk-factors affects the function and behavior of a living organism.
   a) Chemical b) Physical
   c) Biological d) Personnel

PART – II
Answer In Three (Or) Four Points:

1. List out the rights of employees
2. Mention any two kinds of safety tools used in garment industry
3. What are the risk-factor associated in apparel industry?
4. List out the safety measures followed in workplace
5. What is ergonomic design?

PART – III
Answer in a Paragraph

1. Explain the employer duties and responsibilities
2. Enlist the uses of tools and equipment's for safety measures
3. Explain the four risk factors.
4. Explain the process of risk assessment and management.
5. Explain the importance of ergonomics in garment industry

PART – IV
Answer in one Page:

1. Elaborate the importance of safety measures followed in garment industry
2. Design the ergonomic lay out planning for garment sewing section.

Answers for the Objective Questions.

1. (b) 2. (c) 3. (a) 4. (d) 5. (c)

CHAPTER

14 INDUSTRIAL ENGINEERING IN APPAREL INDUSTRY

LEARNING OBJECTIVES

- To learn the basics of industrial engineering in apparel industry
- To know the terminologies in industrial engineering
- To understand the industrial engineering concepts

14.1 INTRODUCTION

The modern day challenges in apparel industries can be met effectively with knowledge regarding industrial engineering. Almost all the top apparel industries have designed their own industrial engineering processes. Industrial engineering in apparel industry aids to eliminate wastefulness in production processes and develop an efficient system to integrate workers, machineries, materials, information and energy to create a product or provide a service as per the required specifications. The main objective of Industrial Engineering (IE) is to increase productivity, reduced wastage and makes best use of resources.

Industrial Engineering Tasks in Apparel Industry

- Find out the foremost economical way of performing a job
- Standardize the strategy, materials, tools and equipment
- Determine the time requirement for the completion of job by the skilled and semi-skilled worker.
- Training the workers on implementation of new method.
- Understanding available machines and manpower requirements
- Planning achievable targets – short and long term.
- Sewing jobs, non-sewing jobs namely designing, pattern making, drafting, spreading, cutting, inspection and packaging, and managerial activities involved in manufacturing of a garment are known as operations. Calculating the operational breakdown of a garment to workout production sequence depending upon the capacity of industry.
- Plan the required production target and make suitable layout design for the machine requirements, material flow and number of workstations to increase overall productivity.

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- Utilization of modern tools for designing the layout.

Who is the father of industrial engineering?

American industrial engineer Frederick W. Taylor (1856–1915) is the father of industrial engineering

14.2 INDUSTRIAL ENGINEERING PROCESS FLOW IN APPAREL INDUSTRY

The flow chart (Figure 14.1) outlines the process flow of industrial engineering in apparel industry. The industrial engineering consists of Research and Development, Garment analysis, Work Measurement and time study along with Data Base Development departments. These departments retain the industrial engineer for the entire activity of apparel manufacturing.

Research and Development Department:

Research and Development department conducts different researches to standardize an economical work practice procedure for production of best quality product at minimum span of time.

Garment Analysis Department:

This department focuses on garment style analysis which includes number of machines and personnel required according to order quantity, time consumption for the entire operation, production target, layout designing, balancing of sewing section line, operator performance, productivity report creation and analysis.

Work Measurement Department:

This department calculates and analyse the time taken to complete the performance of an operation or series of operations. It may also be adapted to set standard times for executing various operations. Under this Work study, Method study and Standard Allowed Minutes for manufacturing a garment (SAM), Standard Minute Value (SMV) in terms of cost for an operation are all calculated in department.

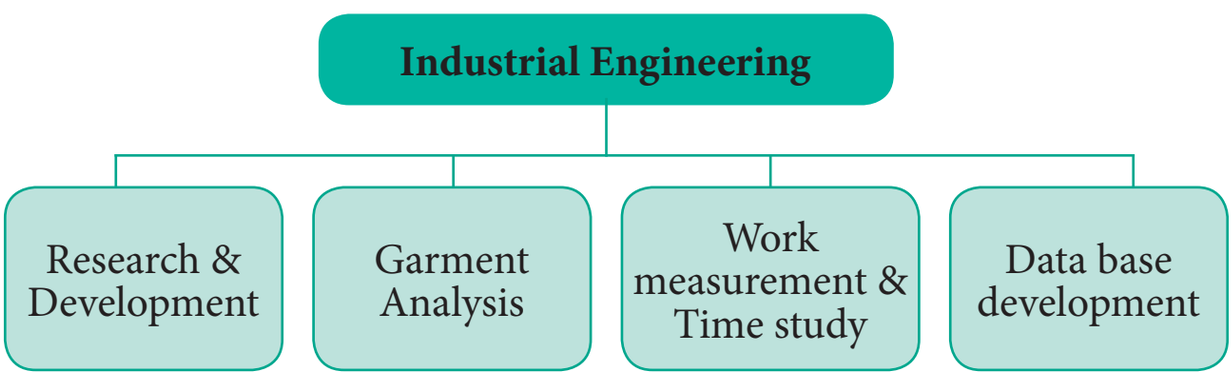

Figure14.1 Industrial Engineering Process Flow in Apparel Industry

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Method study	The principal technique for reducing the work involved is primarily done by reducing unwanted movement and replacing effective methods over conventional techniques.
Allowance time	It is the additional time added to the basic time of an operation. This includes time allotted for personnel requirements, waiting time for arrival of raw materials or delays caused due to machine repair, fatigue of operators, machine time allowance, contingency allowance and the other special situation considered within the policies of organization. Different types of allowance are clearly shown in Figure 14.2
Standard Allowed Minutes	Standard Allowed Minutes (SAM) is the time requisite of qualified worker to perform or complete a job at Standard performance rating. In apparel industry Standard Allowed Minute (SAM) is used to measure the time taken to complete each component of garment.

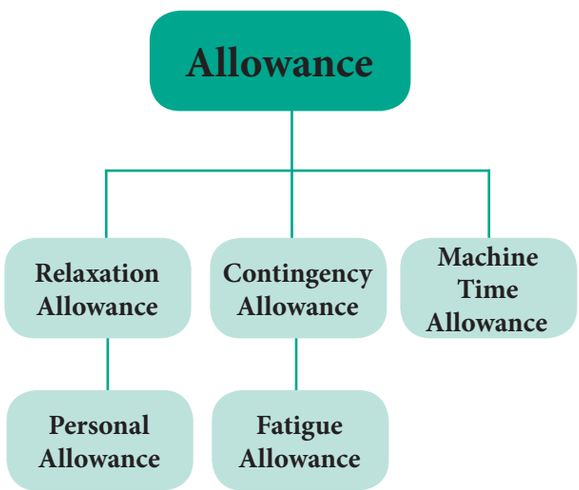

Figure 14.2 Types of Allowances Time

Data Base Development Department:

This department generates data based on the skill performance of the workers and efficiency of production line. The skill performances of worker are compared with the Standard Operating Procedure (SOP) and the workers are rated as skilled, semi-skilled and unskilled. It helps the management for easy decision making process such as setting up the working hours, salary, buying new machineries and equipment.

14.3 CONCEPTS OF INDUSTRIAL ENGINEERING IN APPAREL INDUSTRIES

Some of the most important concepts of industrial engineering in apparel industries are production capacity, line balancing, operational break down and scientific methods of training

Production Capacity

Production capacity is the maximum output that may be achieved with the available facilities. The manufacturing capacity of a factory is denoted by number of apparels made in one minute or one hour by the factory working for that time period. Example:

To calculate the production capacity (number of pieces)

- Factory Capacity in Minutes per day

Total number of sewing machine = 200; Average working hour = 8

Total factory capacity = (200×8×60) = 96,000 minutes/day

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- Average Standard Allowed Minute (SAM)/ shirt = 23 minutes
- Average Efficiency of Factory is 63% (Assumption)

Factory Production Capacity (in Pieces) =Factory Capacity in Minutes/ SAM of Product) × Average Efficiency of Factory

= (96000/23) X 63% =4,174 X (63/100)= 2,630 shirts / day

If factory run 26 days in a month, then the monthly capacity will be

= 2,630 X 26 = 68, 830 Shirts per month

In this calculation, average efficiency of factory is considered as 63%, but it can be improved by adopting Method study, Training of workers and good maintenance of the machines.

Capacity Study

The time taken and the quality of an employee to complete the given job are noted as capacity study. Example: A worker might complete sewing a garment in 23 minutes where as another worker might require 32 minutes. Therefore, the workers produce 21 and 15 garments respectively. Thus indicates the need to improve the performance of the worker who requires 32 minutes to complete the garment.

Reduced Production efficiency = (100/21) X 15 = 71.42% (it is not 100%)

Check Targets

Based up on the orders every sewing line sets target – number of pieces to be constructed per day. This depends upon the sewing efficiency of each operator which varies from person to person. Some operators are able to complete more number of garments. Hence, to achieve the sewing efficiency, in every section, the supervisor should reassign the tasks of sewing operators. Example high performance operator can be assigned for a harder task and an average performance operator can be assigned for easiest task to maintain challenging the production line efficiency. This kind of proper balancing helps to attain the everyday target.

Motivate the Operators

Based on the capacity data, the operators should be encouraged to perform higher level task by the supervisor. The supervisor should motivate the low performance operators to realize/identify their strengths and motivate the operators to attain the everyday targets.

Section Product Capability

By measuring individual operator's capacities, the line or section supervisor can conclude the overall production capacity of their sections. This is convenient for the supervisor to set a production target

Production and Productivity

Production is a procedure of converting raw material into final product with the preferred quality. In a garment industry innovative ideas, designing, planning, pattern making, selection of fabrics, fabric lay, accessories are considered as inputs. The management aspects such as motivation, coordination, control, and manufacturing are considered in

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industrial engineering process, whereas, the finished goods are considered as an output (Figure 14.3.) Example if 8000 apparel pieces are made in an industry per day it is known as production capacity of that garment factory.

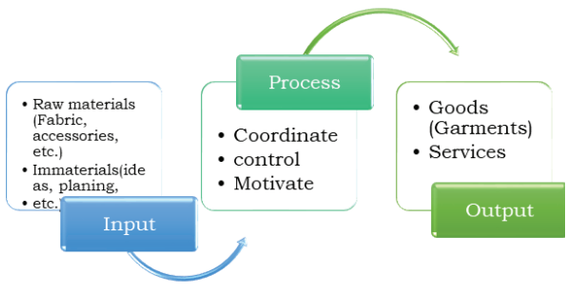

Figure 14.3 Conversion Process of Input into Output

Productivity is the ratio between output and input. It is an index of an organization for effective utilization of resources. Suppose, a garment factory produces 8,000 pieces in a day with 400 operators, productivity is = 8,000/400=20 pieces per operator.

Figure 14.4 Productivity Improvement Techniques

The Productivity improvements techniques includes effective utilization of resources such as space, men, material, machine with proper planning and discipline at the minimum time span. It is clearly shown in Figure 14.4

Efficiency

An operator with greater efficiency will produce more garments. This reduces the manufacturing cost of a garment. Factory capacity is projected according to the line efficiency or an operator's efficiency. Hence, efficiency is the most common measuring tool to denote work performance. Efficiency of time management can be calculated from minutes spent on making the apparel and efficiency of industry can be understood from number of pieces made by the industry per day.

Efficiency Percentage in minutes =Produced minutes ÷Spent minutes X 100

Efficiency Percentage in quantity =Produced quantity÷ Target quantityX100

Where,

Produced minute = Total working minutes; Spent = Time taken to complete an operation.

Produced quantity = Number of quantity produced

Target quantity = Expected to produce as per order quantity

Sewing Line Efficiency Calculation

A sewing line production target is 1,240 but it has an output is 900 pieces, calculate its efficiency percentage in quantity.

Produced quantity = 900

Production target quantity = 1,240

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Efficiency Percentage in quantity = Produced quantity ÷ Production target quantity × 100

Efficiency Percentage in quantity = 900/1,240 × 100 = 72.58%

Productivity Benefits

- Benefits to the management -Better turnover, higher productivity stability of the organization, higher sales and increased reputation of the organization.
- Benefits to workers - Higher earnings, better standard of living, better working conditions, job security and satisfaction.
- Benefits to the consumers- Better quality product, discounts in prices and high satisfaction
- Benefits to the nation- Increases wealth of the nation, improves per capita revenue & GDP, expansion of international market with standardised products, improves standard of living and aids optimum utilization of the resources of the country.

Aim towards the Productive Nation

Factors affecting National Productivity

- Human resources – Health, community level education, increased skill level
- Technology - High capital investment, digital programming based operation and Computer aided designing
- Government regulation – GST, custom clearance, low duty draw back, increased payback period and interest rate on loans

Factors affecting productivity in manufacturing and services

- System design – Research and Development, design lay out; Value added process /products and active participation from industrial engineers.
- Machineries and equipment – use of modern machineries, robotics, conveyors and programming base machines like CNC and CAD can be employed.
- Production volume – Industry size or capacity, skill level of operators and training partners

14.4 SCIENTIFIC METHOD OF TRAINING

The basic abilities or skills required to execute a job should be trained individually by the experts. The training workouts are designed to improve basic skills. Depending on the performance of the operators continuous training program has to be designed until the job performance is achieved. The training will impart knowledge about acceptability, standards, defects and errors. Some of the benefits of scientific method of training are armed towards creating better quality products, more employers being trained by experts, reduction in labor switchovers and production cost.

Scientific Training Components

- Operation analysis – Each task and procedure is analyzed completely in order to find the best methods and to

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determine the skills required for better performance.

- Single job training course – A special training course is planned for each operation to assist the trainee to learn each aspect of the job independently and develop themselves in different stages of training.
- Skill development – Special trainings are designed to cultivate the skills required for specific job.
- Breakdown into parts – The job is broken down into smaller components which the trainee learns one by one. On mastering, each job the operator combines task and completes the entire operation.
- Spaced learning – The trainee's activities are planned in order to deliver change of activities. This helps in retaining interest and concentration of trainees.
- Rhythm and pace – The trainee studies each part and skill of the job at 100% right from beginning.
- Stamina buildup – At first the training is given for short period gradually it is extended for longer period to improve stamina.
- Goals and targets – Objectives are set for every stage of training. This enables each trainee to know how they are progressing and gives them a sense of achievement.
- Measurements and controls – The trainee's improvements are measured prudently at every stage, so that both the trainee and the expert have an complete knowledge.
- Individual program – Each trainee progresses according to their ability and spends most of their time in practicing all aspects of the job especially in tasks where they need to acquire more skills.
- Training Centre – Trainees should have an atmosphere suitable to learn without any disturbance. Training should not be conducted in the production area.
- Quality specification – Complete quality specifications should be followed in training
- Participation – The trainees are motivated to develop a sense of accountability and pride by contributing actively in the administration and training activities.
- Training instructors – Full time instructors aid in successful training process.

14.5 LINE BALANCING

Balancing is the method of keeping the same level of inventory or load at each and every operation at any point of time to meet the production target and to manufacture garments in acceptable quality standards.

Line Balancing is balancing the workload across all operations in a stitching line or any operation line to eradicate bottlenecks and manage additional capacity. The aim of the process is to 'balance the workload' of each and every operation to make sure that the flow of work/task is smooth with high level performance. This process is proposed to reduce waiting time. A model balancing work is illustrated in Figure 14.5.

Operation with the lowest production per hour is called a bottleneck operation for

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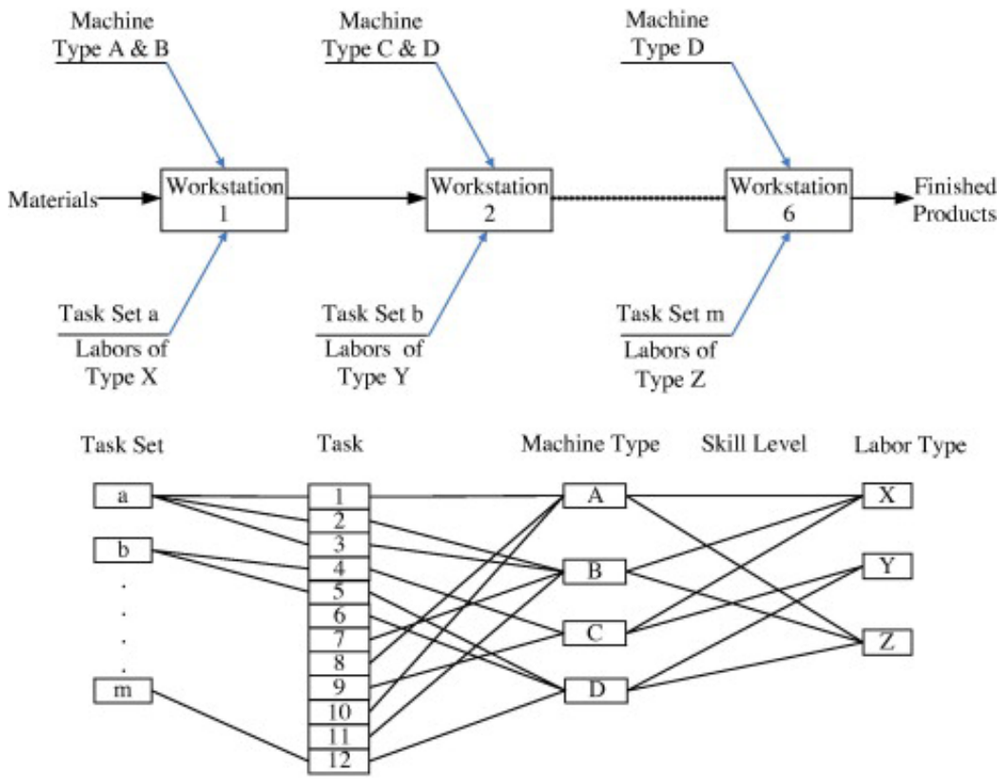


Figure14.5 Sewing Line with Task, Task Set, Machine Type, Skill Level, and Labor Type

a particular line. A bottleneck operation in a line decides the output. Hence, it is very important to avoid or remove the bottleneck processes or operations.

Line Balancing Objectives

- To meet the production target
- To avoid or minimize waiting time
- To minimize or reduce over time
- To assure and protect the operators earnings

Steps in Line balancing

The method of line balancing will vary from factory to factory and it depends on type of garments manufactured; but at any occasion, line balancing concerns itself with two distinct applications namely opening the line and operating the line. Opening in the line operation includes calculation of labour requirements, operation break down, theoretical operational balance and initial balance. Operating the line indicates balance control in real production.

14.6 OPERATION BREAK-DOWN

The method of preparing an operations list in a sequence or the sheet of listed operations for a particular style of garment is known as **"Operation Breakdown"**. Polo T shirt operation breakdown is given in Figure (14.6) for clear understanding.

Application of operation breakdown

The operation breakdown of a garment is done in order to understand the steps in garment construction–For example stitch class and seam types used in making a sample garment.

XI_EM_TDD_CHAP14_2022.indd 159 5/3/2022 9:52:02 AM

S.No	Operation	SAM	Machine Type
Cutting Operations			
1	Fuse Placket	0.13	Fusing machine
2	Hem Front Placket	0.55	SNLS
3	Bottom Hem	0.64	Flat Lock w/trimmer
4	Size label to main label	0.22	SNLS w/UBT
5	Main label to yoke	0.28	SNLS w/UBT
Stitching Operations			
1	Attach placket to front	0.83	SNLS
	Cut placket		Manual
2	Front placket edge stitch	0.51	SNLS
3	Sew Box at placket	0.68	SNLS w/CP
4	Yoke attach to back	0.46	DNLS
5	Shoulder over lock	0.56	ST O/L
6	Top stitch shoulder	0.34	SNLS
7	Tack piping at collar ends		
	Attach piping to collar	0.77	SNLS
8	Turn placket ends inside out		
	Finish Piping	1.00	SNLS
9	Cuff O/L	0.45	5T O/L
10	Cuff Topstitch	0.59	SNLS
11	Sleeve attach	0.89	5T O/L
12	Sleeve topstitch	0.60	SNLS
13	Slits Making	1.40	SNLS
14	Side seam O/L & bottom placket O/L	0.86	4T O/L
15	Tack at sleeve ends	0.30	SNLS
Finishing Operations			
1	Button Hole	0.29	B/H m/c
2	Button attaching	0.30	Buttoning M/c
3	Thread trimming	0.35	Manual
4	Garment inspection	1.45	Manual
5	Ironing the garment		Manual
6	Packing	0.43	Manual
	Total SAM	12.65	

Figure 14.6 Operation Break-Down for T-shirt

- To recognize the number of operations needed for a sample garment preparation.
- To identify the number and types of sewing machines and other equipment required.
- To allocate a person or a set of line supervisors or engineers to follow the new operational breakdown.

In a large manufacturing industry operations are referred by an ID number for all operations list and machines allocated for a particular style.

How old is industrial engineering?

Industrial engineering can be traced back to the start of the Industrial Revolution in the late 18th century.

XI_EM_TDD_CHAP14_2022.indd 160 5/3/2022 9:52:02 AM

14.7 SUMMARY

Industrial engineering activities used in apparel production process includes methods to reduce Man, Machine and Material wastage in the Apparel Production process. Analyzing the productivity details on all sections based on style of garment and reviews the techniques for in-house correction and openness for a knowledge/technology approach. Work study, Method study, Line balancing and Operation breakdown are the important tasks that are frequently redefined for better production efficiency.

POINTS TO REMEMBER

- Industrial engineering in apparel industry aids to eliminate wastefulness in production processes and develop an efficient system to integrate workers, machineries, materials, information and energy to create a product or provide a service as per required specifications.
- The principal technique for reducing the work involved, primarily by reducing unwanted movement and replacing effective methods for better quality is called method study.
- Work measurements analyze and calculate the time taken to complete the performance of an operation or series of operations.
- Sewing jobs, non-sewing jobs namely designing, pattern making, drafting, spreading, cutting, inspection and packaging and managerial activities involved in manufacturing of a garment are known as operations.
- Garment manufacturers dealing with international brands/buyers understand the need for industrial engineering. Industrial engineering impressions and application has made great impacts in the garment industry mostly in the production areas.
- Balancing is the method of keeping the same level of inventory or load at each operation/ points.
- Every operation at any point of time to meet the production target and to manufacture garments in acceptable quality standards.

ACTIVITIES FOR THE TEACHER

- Show a video of an industrial engineering practices followed in apparel industry.

ACTIVITIES FOR STUDENTS

- Prepare an operation breakdown chart for Full hand shirt.

XI_EM_TDD_CHAP14_2022.indd 161 5/3/2022 9:52:02 AM

GLOSSARY

Operation	An action of functioning
Layout	The process of setting or arranging
Database	A structured set of data
Capacity	The amount that something can produce.
Capability	The power or ability to do something
Stamina	The ability to sustain prolonged physical or mental effort
Line Balancing	Keeping the same level of inventory or load
Wastefulness	It is a habit of using things carelessly or recklessly
Inventory	A complete list of items or goods in stock, or the contents of a building

INTERNET RESOURCES

https://www.youtube.com/watch?v=OXQm-da6W9Y	How to calculate garment SAM?
https://www.youtube.com/watch?v=sp4JxP5T528	Job responsibility of Industrial Engineer
https://www.youtube.com/watch?v=60vtQJ4EGrM	How to reduce waste and improve productivity in garment industry
https://www.youtube.com/watch?v=qkOMlDQU_HA	Line balancing and bottle neck formation
https://www.youtube.com/watch?v=OQv7rruXhrI&t=28s	Establishing standard time

QUESTIONS AND ANSWERS

PART – I

Objective Questions:

1. Industrial engineers find ways to _____ wastefulness in production processes

   a) Eliminate b) Increase c) Huge d) Optimize

XI_EM_TDD_CHAP14_2022.indd 162 5/3/2022 9:52:02 AM

2. Operation breakdown of a garment to determine_____ of stitch type and seam type of every operation

a) Style

b) Variation

c) Sequences

d) Class

3. Operation with the lowest production per hour is called a _____ operation

a) Poor

b) Bottleneck

c) Small

d) Semi-skill

4. Line balancing is _____ the workload across all operations in a line to remove bottlenecks and excess capacity

a) Managing

b) Sharing

c) Leveling

d) Adjusting

5. Garment factory capacity is estimated according to the _____ or line efficiency.

a) Machine

b) Operator

c) Production

d) industry volume

PART – II

Answer In Three (Or) Four Points:

1. Write the objectives of industrial engineering
2. What is Standard Allowed Minutes (SAM)?
3. Enlist the objectives of balancing.
4. Define production and productivity
5. What is work measurement?

PART – III

Answer in a Paragraph

1. Mention the industrial engineer task in apparel industry.
2. Make a note on method study.
3. Draw a flow chart on Industrial engineering control in apparel industry
4. List out the factors affecting productivity of an apparel industry.
5. Write the application of operation breakdown in apparel industry.

PART – IV

Answer in one Page:

1. Elaborate the procedure of operation breakdown for T shirt in detail.
2. Describe the scientific method of training in detail.

Answers for the Objective Questions.

1. (a) 2. (c) 3. (b) 4. (c) 5. (b)

XI_EM_TDD_CHAP14_2022.indd 163 5/3/2022 9:52:02 AM

CHAPTER

15 FASHION CONCEPTS

LEARNING OBJECTIVES

- **To understand the basic concepts and terms used in the field of fashion.**
- **To gain knowledge about the theories of fashion.**
- **To Learn about the International and Indian fashion designers**

15.1 INTRODUCTION

The term fashion is a bussing word across the world. Every individual irrespective of age and sex wants to look fashionable. Fashion can be described as an art since it requires creativity. It includes all types of clothing, hair styling and accessories. In fashion industry different terminologies are used to differentiate various styles and functions. Knowledge about these terms will help one to understand the concepts of fashion. Fashion is both arts and science. Unlike many other industries fashion is based on innovation, creative ideas and thinking ahead. Fashion can be described as private because it is the reflection of one's physical, psychological and social status. On the other hand it can also be described as public because once a style is introduced everyone starts using this style.

What is House of Worth?

The House of Worth was a French house of high fashion that specialized in haute couture, ready-to-wear clothes, and perfumes. The historic house was founded in 1858 by designer Charles Frederick Worth

15.2 TERMINOLOGIES OF FASHION

Silhouette

The silhouette is an outline or contour of a garment. Shape of the silhouettes will vary when there is a change in fashion. There are three basic forms of silhouettes;

- Tubular
- Bell
- Back fullness

Haute Couture

It means high fashion making. Fashion houses with designers create original designs

Fad

Short lived fashion

Couturier

It is the french term that denotes male designer. Female designer is termed as Couturiere.

Designers will have their own fashion house. For each season, the designers introduce fashion garments which he assumes to suit that particular season.

Avant-Garde

This term indicates the wild designs. These styles attract everyone because of bold designs and colour.

Mass Fashion or Street Fashion

These styles are accepted by majority of the people. They are available in all price ranges and styles.

Custommade

It refers to garments which are stitched to order. It fits an individual well. The garments are stitched very carefully.

Knock – Off

This refers to the copied version of high fashion designs that is produced in a cheaper rate. They are produced with lower quality materials and cheaper workmanship.

Seconds

These are factory rejected items and are priced lower.

Design

A design in terms of fashion in garment making is described as a unique version of style. In simple terms it is an extraordinary pattern which is not seen commonly in the market when introduced newly.

15.3 FASHION CYCLES

Any new product which comes to the market will find its way slowly and if liked by all then its production will increase and sales will boost up and finally the use of this product will slowly decline. This is true in the fashion industry also. This growth and fall in a fashion product is called the fashion cycle.

The fashion cycle is depicted in five stages (Figure 15.1).

- Introduction.
- Rise.
- Peak.
- Decline.
- Rejection or obsolescence.

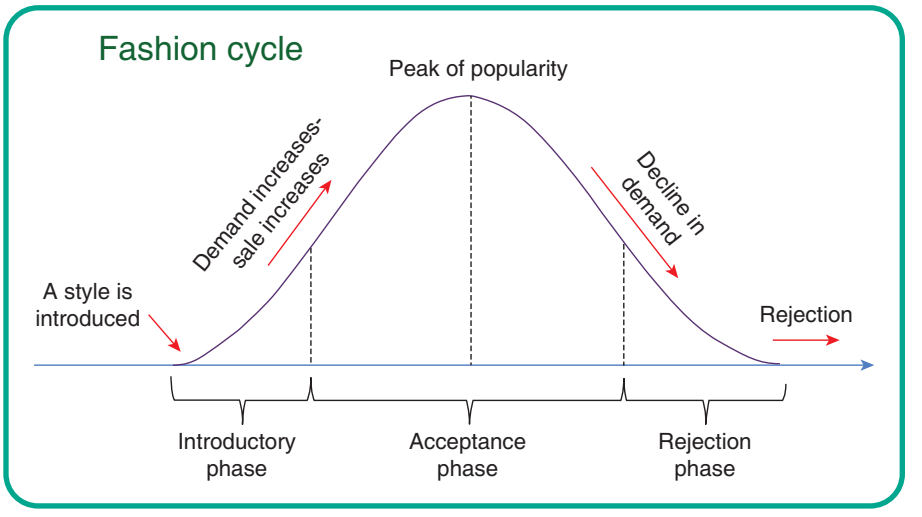


Figure 15.1 Fashion Cycle

Introduction

- This is the first stage of fashion cycle.
- New styles are introduced.
- Shape , colour, and texture are changed to create styles.
- Garments are produced in limited quantity.
- They are expensive.

Rise

- This is the second stage of fashion cycle.
- Style is accepted by more number of people.
- It attracts the attention of buyers.
- Demand for the style is more.
- Orders for accepted style increases.

Peak

- This is the third stage of fashion cycle.
- Demand for the style is higher.
- Manufactures produce more garments.
- Styles will be available in all price ranges.
- Sometimes this style will settle as classic.

Decline

- Demand is decreased.
- Consumers will look for new designs.
- Styles will be available in discount sales.
- Manufactures stop producing the particular style.
- Styles are sold at very low price.

Rejection or Obsolescence

- This is the last stage of the fashion cycle.
- Consumers reject the style.
- Style is referred as out of fashion.
- Products will be sold at very lower price ranges.
- Retail stores clear the stocks completely.

Who is Wendell Rodricks?

Wendell Rodricks is an Indian Fashion designer who was awarded India's fourth highest civilian honour, the Padma Shri by The President of India, Pranab Mukherjee for Art (Fashion Design).

He studied Fashion Designing in the USA and France from 1986 to 1988. Wendell's first collection from Goa earned him the title 'Guru of Minimalism' and his next collection in 1995 pioneered the concept of 'resort wear' and 'eco-friendly' garments

Wendell Rodricks

15.4 THEORIES OF FASHION

Fashion theories indicates the process of fashion ideas. The theories explain the fashion trend. It also tells about how fashion moves from one stage to other stage. There are three theories of fashion (Figure 15.2).

- Trickle down theory
- Horizontal-flow theory
- Trickle up theory.

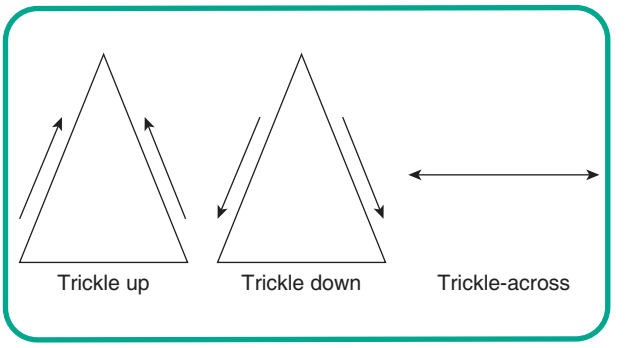


Figure 15.2 Theories of Fashion

Trickle Down Theory

- This is the oldest theory of fashion
- It indicates the true fashion
- It starts from top social level people to low social level people.
- Royal families introduced the fashion in olden days.
- Gradually upper class people copy them and then by the lower class of people.
- Fashion pass from fashion leaders to the lower class people also.
- Example- Jeans, Asymmetrical tops.

Horizontal-Flow Theory

- This is also called as Trickle Across Theory.
- In 20th century fashion became similar to all levels of people at the same time.
- Fashion is not created by any section of people.
- Celebrities give an identity to fashion.
- Various designers introduce new fashions in affordable prices.
- High priced garment styles are copied and produced in mass.
- Examples - jogging suits, bell bottom and kurta style tops.

Trickle Up Theory

- This theory is a newer theory.
- It is purely an idea of youngsters.
- Fashions pass from youth to the aged people.
- This is also called street fashion.
- Youth create new mix and match styles.
- Fashion gradually moves from lower class people to fashion leaders.
- Example- Denim, glitter tops, T shirts, metal shine garments.

Who is the father of Haute couture?

Charles Frederick Worth was an English fashion designer who founded the House of Worth, one of the foremost fashion houses of the 19th and early 20th centuries. He is considered by many fashion historians to be the father of haute couture.

Charles Frederick Worth

15.5 FASHION FORECASTING

Fashion forecasting is the prediction of consumers buying behaviour, mood and interests. It can be defined as the process of studying and formulating predictions about customers buying habits. Based on the evaluation and predictions, forecasters will be able to provide designers and manufacturers with a vision of the future. Through researches, forecasters identify the cultural, ethical and social shifts of consumers and how these changes will affect the future consumer behaviour. Fashion forecasters set the trend for attracting consumers and help the manufacturers and retail businesses to sell their brand.

Importance of Forecasting

Forecasting is an inevitable part of all businesses. Precise analysis of consumer likes and interests are vital in developing brand direction and development, which ultimately ensures growth and success

of brands. Here are some important practices in fashion forecasting:

- Considering the season, (Spring/ Summer/ Fall/ Winter) this helps in selecting the most comfortable and consumer preferred fashion
- Studying trends based on the selected season and market thread
- Understand the demography of the area
- Most importantly, decide the product category

Role of Fashion Forecaster

A fashion forecaster predicts the style, colour, textures, prints, fabrics, accessories and footwear. for the coming season. They observe new and emerging trends on the runway and retail outlets from season to season across varies industries. Fashion forecasters also take into consideration various happening currently in the world.

Fashion Forecasting Agencies

- WGSN : Worth Global Style Network

  WGSN was founded by Julian and Marc Worth in West London during 1998. It is a trend forecasting service agency which helps designers, brands, retailers to know about the marketing, business strategies and retail pricing. Anyone can get inspiration and design ideas from their reports, images and design resources.

15.6 FASHION DESIGNING

Fashion design is the use of design and style to create attire and adornments. Fashion designing is related to social scopes. It fluctuates after some time and place.

Role of Fashion Designing

The meaning of fashion varies from one individual to another. For some people, it is the recent trend in clothing, accessories and footwear for some others it is a way of living and life style. People who are interested in fashion tries to keep an up to date knowledge regarding fashion, styles and trends by following different fashion medias and magazines. Fashion designing is important in everyone's life because it gives an impression about the person that he/she is dressed in the most recent style.

DO YOU KNOW?

What is haute couture?

Haute couture is creation of exclusive custom-fitted clothing. Haute couture is high-end fashion that is constructed by hand from start to finish, made from high-quality, expensive, often unusual fabric and sewn with extreme attention to detail and finished by the most experienced and capable sewers, often using time-consuming, hand-executed techniques.

Haute Couture

15.7 FASHION DESIGNER

Fashion designer creates their own original outlines, designs for clothing, foot wear and associates garments. Fashion designers, create clothing by adding their time, efforts and designing skills. They often try to bring cultural attitudes,

aesthetics, and inspirations to their designs. A fashion designer can master any particular area example foot wear.

Role of Fashion Designers

Fashion designers create and design dresses, suits, other clothing and accessories which are of high demand consumer preferences. Designer's study various fashion trends and sketch/ design clothes; select the colour, fabrics and accessories that suit the style. They foresee the final look of attire and work according to the customer's preferences.

The first step in creating a style is conducting a study about the current fashion and making predictions for the future. One can depend on the trend reports to save time but those designers who want to create their label in fashion conduct their own research and find the best for their customers.

Types of Fashion Designers

- Creative Fashion Designer

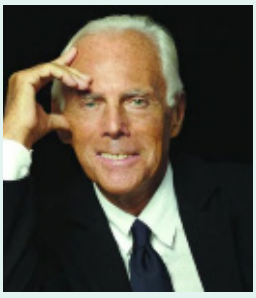
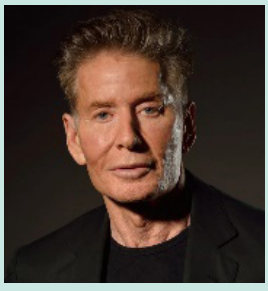
  Creative fashion designer holds the top most position in the entire fashion house. They don't design cloths but instead designs and formulates the new fashion concepts. They create new fashion concepts with unique drawings and illustrations which helps the branding label to create a new fashion concept.

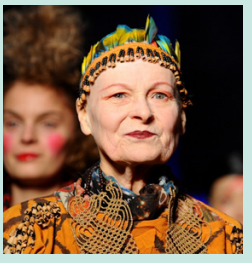
- Technical Fashion Designer

  The creativity of the creative designers are fulfilled and converted into a finished garment by the Technical designers. They give the end product which reflects the ideas of creative designers. The corrections are made by the technical designers to get the desired fashion attire.

International Fashion Designers

Name & Country	Contribution & Accolades
Coco Chanel **France**	**Contribution** Famous for timeless designs, trademark suits and little black dresses, the famous fashion designer, Coco Chanel is a true epitome of creativity. Coco Chanel is majorly known for introducing the concept of using jersey fabric to create an embellished clothing for women' undergarments. **Accolades** • Chanel is the only fashion designer who features on Time magazine's list of the 100 most influential people of the 20th century. • Today, Chanel stands among one of the world's top brands in fashion.

Georgio Armani  **Milan, Italy**	**Contribution** Popularly known for the uniqueness, elegance and style in the fashion line. Apart from clothing, he has expanded the company's horizons into perfumes with unique fragrances, hotels, restaurants, and cafes worldwide **Accolades** • David di Donatello Golden Plate Award • CFDA Valentino Garavani and Giancarlo Giammetti International Award • Bambi - Creativity
Calvin Klein  **New York**	**Contribution** Designer is known worldwide for his extravagancy in the fashion industry. **Accolades** • Prestigious Coty Awards from 1973 to 1975, becoming the youngest designer ever to achieve the feat • Awards from the Councils of Fashion Designs of America in 1981, 1983 and 1993 • Listed on the International Best Dressed List in 1983 • Listed in 25 most influential Americans, published by Times Magazine- 1996
Donatella Versace **Italy**	**Contribution** Well known for catwalk collections and create costumes for theatre and ballet. Most notable works were designed for the choreographer Maurice Béjart. Specialised in accessories, home furnishings, and hotels, morphing Versace into a complete lifestyle brand **Accolades** • 'Rodeo Drive Walk of Style' and 'Fashion Group International Superstar Award'(2007) • Nominated for the 'VH1 Do Something With Style Award' for providing art supplies to children (2010)
Lee Alexander McQueen **London**	**Contribution** Changed the course of fashion and taught designers to be daring; to explore their imaginations and hold on to their integrity. **Accolades** • British Designer of the Year by the British Fashion Council four times between 1996 and 2001. • Awarded with International Designer of the Year by the Council of Fashion Designers of America. (2003)

Christian Louboutin **France**	**Contribution** Most famous shoe designers in history and known for sensuous, luxurious shoes. **Accolades** • Winner of the 2019 Couture Council Award for Artistry of Fashion. • Red soles, was to receive the Honour by the Couture Council of The Museum at FIT
Vivienne Westwood  **British**	**Contribution** Introduced punk-inspired designs in Malcom McLaren's influential Kings Road store, in 1970s. The Dame of the British Empire revolutionised what is deemed appropriate to wear in public. **Accolades** • Bambi Fashion for luxury foot wear line -red soles Awards. Bambi (1996) Fashion. • British GQ Man Of The Year (2021) • The Fashion Awards. Swarovski Award (2018)
Karl Lagerfeld **Germany**	**Contribution** Designed Chanel's ready-to-wear and couture lines, his own label, and collaborated with Silvia Fendi to create Fendi's ready-to-wear collections. **Accolades** • CFDA Fashion Award in 1982 • The Accessory Designer of the Year award in 1991 • The Life time Achievement Award in 2002
Nicolas Ghesquière **France**	**Contribution** Creative director of Balenciaga (1997–2012) and as artistic director of Louis Vuitton (2013–), earned a reputation as the most original designer of his generation **Accolades** • Avant-garde designer of the year at the VH1/Vogue Fashion Awards • Womens wear Designer of the Year by the CFDA • TIME 100 Most Influential People.
Miuccia Prada **Italy**	**Contribution** Known for haute couture to accessories and eyewear, from sports to the arts and even confectionery. Prada brand is all about luxury **Accolades** • 2020 Fashion Award under the Creativity category • Women of the Year Award, 2016 • The highest honorary title of the Order of Merit of the Republic, the title of Knight of The Grand Cross (2005)

Marc Jacobs **New York**	**Contribution** Most notable "grunge" collection, which was credited with launching the grunge look of the 1990's. **Accolades** • Youngest designer ever to receive the Council of Fashion Designers of America's Perry Ellis Award for New Fashion Talent. • Women's Designer of the Year award from the Council of Fashion Designers of America in 1993.

Indian Fashion Designers

Name and Place of birth	Contribution & Accolades
Sabyasachi Mukherjee Kolkata	**Contribution** Initiated Save the Saree to remove hand-woven Indian sarees on a non-profit basis to support the weavers of Murshidabad **Accolades** • Best Designer of Hindustan at the MTV Lycra style awards. • Society Achievers award for the best new Indian designer. • Only Indian designer invited to showcase at Italy's indigenous fashion showcase Milan Fashion Week 2004
RohitBal Kashmir	**Contribution** Time Magazine dubbed the designer "India's Master of Fabric and Fantasy." Best known for using of Lotus and Peacock motifs, in his clothing, (2006) **Accolades** • 'Designer of the Year' award at the Indian Fashion Awards in 2006 • 'Designer of the Year' at the Kingfisher Fashion Achievement Awards in 2001 • Lakme Grand Finale Designer for 2012
Manish Malhotra Mumbai	**Contribution** Couturier, costume stylist, entrepreneur, and revivalist famous for his outlook on the importance of costumes in films. **Accolades** • 30 Years of outstanding contribution to Bollywood Fashion

AnjuModi Jharkhand	**Contribution** Supported the revival of traditional crafts and textiles **Accolades** • Filmfare Award for Best Costume Design in 2016
Ritu Kumar Amritsar	**Contribution** Largest designer-wear brand in India. Since 1969 she has developed a unique style of ancient traditions of Indian craftsmanship. **Accolades** • Lifetime achievement award by NIFT. • Lifetime achievement award by Kingfisher Group. • Outstanding Woman Entrepreneur award by PDHCC. • Award of "Chevalier des arts et des Lettres" from French government. • Lifetime achievement award at Kingfisher Fashion Fantasia (2000)
TarunTahiliani Mumbai	**Contribution** Opened doors to India's first multi designer boutique. **Accolades** • Moet and Chandon Fashion Tribute 2004 Award for Designer of the Year for India, and was invited to represent India at Hong Kong in October 2004 • Fashion Award 2004 for Best Women's Designer for Couture • Office-bearer and member of the Fashion Design Council of India.
Anita Dongrei Mumbai	**Contribution** Introduced signature style to create affinity for indigenous craft tradition, coupled with a modern aesthetic support countless rural women an equal voice by providing them with livelihood opportunities and skill training **Accolades** • 2013, 'Excellence in Fashion Design'. • 2014, EY Entrepreneur of the year award.

Neeta Lullai Mumbai	**Contribution** Uses traditional Indian textiles for 60 percent of her collections, increasing the sustainable focus of her brand **Accolades** • Technical Award [Winner] (2009) Best Costume Design. Jodhaa Akbar (2008) • Award for Technical Excellence [Winner] (2003) Best Costume Designer. Devdas (2002) • Award for Technical Excellence [Winner] (2000) Best Costume Designer. Taal (1999)
BibhuMohapatra Rourkela	**Contribution** Launched a collection of diamond jewellery in India in 2016 with ForeverMark a division of Debeers. **Accolades** • Women's Apparel 2010 Rising Star Award," by The Fashion Group International • "Young Innovator Award" from the National Arts Club

15.8 SUMMARY

Fashion is the term that attracts every one. It keeps changing now and then.It emerges as new for each and every season. Fashion consists of many styles. Therefore the terminologies are used to identify the styles and their features. Fashion happens in a cyclic manner. Fashion is introduced into the market and it gains popularity. After a period of time, popularity of fashion is declined. Fashion cycle has five stages such as introduction, rise, peak, decline and rejection or obsolescence. People can be identified with the stages of fashion cycle. Adoption of fashion by people varies based on certain factors like acceptance, price and motivation. There are three theories related to fashion adoption. They are Trickle-down theory, Horizontal-flow theory and Trickle up theory. Fashion may shift from high category of people to lower. Some street fashion styles may reappear as high fashion garment.

INTERNET RESOURCES

https://www.youtube.com/watch?v=7S0yjUYuwlg	How to create your own fashion collection

POINTS TO REMEMBER

- Fashion is both arts and science
- Fashion terms help to understand the concepts of fashion.
- Fashion cycle has five stages such as introduction, rise, peak, decline and rejection or obsolescence.

ACTIVITIES FOR THE TEACHER

- Display - colorful magazines.
- Quoting examples - movie costumes and brands.

ACTIVITIES FOR STUDENTS

- Preparing picture album for types of fashion.

GLOSSARY

1.	Silhoutte	The silhouette is an outline or contour of a garment.
2.	Haute Couture	It means high fashion making. Fashion houses with designer create original designs.
3.	Fashion cycle	The growth and decline of fashion.
4.	Avant-garde	This term indicates the wild designs.
5.	Trickle-up-theory	This theory is a new theory. It is purely an idea of youngsters. Eg. Denim, T-Shirts.
6.	Trickle-down-theory	This is the oldest theory of fashion. It indicates the true fashion. Eg. Jeans.

QUESTIONS AND ANSWERS

PART – I

Objective Questions:

1. _____ express normality of fashion style.
   a) Gothic fashion style
   b) vibrant fashion style
   c) casual fashion style
   d) preppy fashion style

2. WSGN does not help _____
   a) Manufacturers
   b) Designers
   c) Brands
   d) Retailers

3. Working with different fabric to achieve the illustreated image is the work of _____

a) Creative designer

b) Technical designer

c) Fabric designer

d) Illustrator

4. Most popular style at given time.

(a) Fad

(b) Fashion

(c) Taste

(d) Designer Label

5. Short lived fashion.

(a) Fad

(b) Mass

(c) Limited

(d) Knock-Offs

6. A copy of a higher priced style.

(a) Mass Style

(b) Limited Fashion

(c) Fad

(d) Knock-Offs

7. Out fashioned garments are sold in stage.

(a) Introduction

(b) Rise

(c) Decline

(d) Obsolescence.

8. An example for Trickle up theory.

(a) High fashion

(b) Mass fashion

(c) Street fashion

(d) Celebrity fashion

PART – II

Answer In Three (Or) Four Points:

1. Differentiate between custommade and mass fashion.
2. What do you mean by the term Knock off?
3. Explain trickle up theory with a good example
4. Explain silhouette.

PART – III

Answer in a Paragraph

1. Write about the fashion cycle with example
2. Describe theories of fashion adoption.

PART – IV

Answer in one Page:

1. What are the terminologies used in fashion?
2. Elaborate on fashion cycle.

Answers for Objective Questions

1. (c) 2 (a) 3 (b) 4. (b)

5. (a) 6. (d) 7. (d) 8. (c)

MODEL QUESTION PAPER

STD: XI **MARKS:90**

PART-I

Choose the correct answer **15 × 1=15**

1. Covering the body in a proper way is considered as
   a) Identification b) Uniform
   c) Modesty d) Insignias

2. Pick out the natural fiber.
   a) Rayon b) Nylon
   c) Silk d) Acetate

3. The lengthwise edge of fabric is called
   a) Warp b) Weft
   c) Selvedges d) Filling

4. _____ is used to insert tapes through casings.
   a) Thimble b) Loop turner
   c) French curve d) Bodkin

5. _____ is substituted for machine stitch.
   a) Running stitch
   b) Hem stitch
   c) Back stitch
   d) Whipping stitch

6. ____ helps the movement of the machine.
   a) Fly wheel b) Slide plate
   c) Clutch d) Tension disc

7. Human body can be divided into
   a) 6 heads b) 8 heads
   c) 9 heads d) 5 heads

8. Matching _____ should be provided along seams to show which seams are to be joined together.
   a) Notches b) Lines
   c) Opening d) Stitches

9. _____ fabrics are course to touch.
   a) Cotton b) Silk
   c) Woolen d) Rayon

10. Run and fell seam is commonly known as
    a) French seam
    b) Piped seam
    c) Mantua maker seam
    d) Flat felt seam

11. Magyar sleeve is an extension of the _____
    a) Shoulder line
    b) Armhole
    c) Bodice front and back
    d) Neck line

12. _____ is a simple technique of giving a textured look to the garment.
    a) Appliqué b) Quilting
    c) Scallops d) Bows

13. _____ means high fashion making.

a) Couturier b) Haute couture
c) Avant-garde d) Knock – off

14. The main objectives of industrial engineering is

a) Save time and use selected resources
b) Increase productivity and reduce wastage
c) Use scientific training methods and modern technologies

15. 'Goose Neck' is required for _____ to enable the operator to see clearly

a) Task light b) inbuilt
c) Power room lights d) head gear

PART-II

Answer any ten question (Question no.27 is compulsory) **10 × 3=30**

16 Explain clothing based upon the area of occupation.

17. Give some uses of natural fibers.

18. Name the common finishes given to acetate fabrics.

19. What is yarn twist?

20. List the major parts of a loom.

21. What are the uses of tailors tacking?

22. Explain top threading

23. How will you take elbow and wrist round measurement?

24. What are the uses of yokes in a garment?

25. Explain Trickle up theory.

26. Describe that sketching.

27. Mention the major hazards in a garment industry.

28. What is line balance?

PART-III

Answer any five question (question no.34 is compulsory) **5 × 5=25**

29. Draw a simple motif showing 2 embroidery stitches and explain the method of making it.

30. What are the reasons and rectification for needle breaking?

31. What are the advantages of paper patterns?

32. What are the principles to be followed while planning a decoration?

33. Mention the safety measured to be followed in the cutting department.

34. Write a short note on the concept of line balancing in an apparel industry.

35. Draw and brief on the types of necklines.

PART-IV

Answer in detail **2 × 10=20**

36. Describe on the need for clothing with suitable examples.

OR

Explain the basic tools used in cutting and marking patterns.

37. Account for the types of seams with suitable diagrams.

OR

Elaborate on fashion cycle and quote an example.

TEXTILES AND DRESS DESIGNING

PRACTICAL

CONTENTS

PRACTICALS

1. Demonstration of Sewing machine Operation 181

2. Preparation of sample for Basic and Decorative Stitches 185

3. Preparation of Samples for Seams and Seam Finishes 193

4. Preparation of Sample for Various Types of Fullness 197

5. Preparation of Sample for Types of Garment Components 202

6. Pattern Making - Preparation of Basic Pattern Set 211

7. Preparation of Sample for Types of Embellishments 223

8. Development of Flat Sketches for Garment Components 227

9. Garment Construction 230

Project 247

Industrial Exposure 247

Model Question Paper – Practical 248

Reference Books 249

XI_EM_TDD_PRACTICALS_2022.indd 180 24-01-2023 14:09:35

PRACTICAL

1

DEMONSTRATION OF SEWING MACHINE OPERATION

Objectives:

- To attain leg and hand coordination during the machine operation
- To understand stitch density, sewing machine operations and length of the stitches.

Operation sequence to be followed

Bobbin Winding and Loading

↓

Threading Practice

↓

Sewing Practice

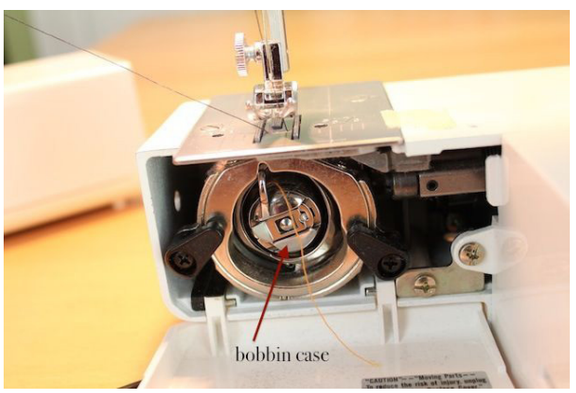
Tools and Equipment Required

Activity Title	S. No	Name of the apparatus/ components	Range/Value	Quantity
Preparing for the Sewing Machine Operation	1	Sewing machine	-	1
	2	Sewing kit		1
Demonstration of Sewing Machine Operation	1	Newspapers and markers	-	2
	2	Fabric	Grey cloth	½ m

Bobbin Winding and Loading Procedure

Step 1: Place the thread on the thread holder and loop it through metal hooks which are located above it.

Step 2: Bring the thread down through small hole and bring it around the tension disc.



XI_EM_TDD_PRACTICALS_2022.indd 181 24-01-2023 14:09:35

Step 3: Place the bobbin on the knob and wind the thread manually.

Step 4: Turn on the machine

Step 5: Wind the bobbin slowly by moving the foot pedal

Step 6: Place the bobbin into the bobbin case

Step 7: Pull the thread to the left and slightly back and then slip it underneath the metal piece behind the slit.

Step 9: Pull and hold the tab on the top of the bobbin case, place the bobbin into the case. Release the tab to fix the bobbin into the bobbin case.

Step 10: Open the throat plate and insert the bobbin case into the lower part of the machine.

Threading Practice - Procedure

Step 1: Turn off the machine

Step 2: Raise the presser foot lever.

Step 3: Raise the needle by turning the hand wheel towards you.

Note: If the needle is not correctly raised, the sewing machine cannot be threaded.

Step 4: Put a spool of thread on the spool pin and bring the thread to the front of the sewing machine through thread guide.

Step 5: Pass the upper thread through the three holes which looks like "S" shape.

Step 6: Insert the thread from right to left on the first hole and again pass it over the second hole.

Step 7: Pass the thread around the tension disc and then through the ring. Pull the thread into the metal knob.

Step 8: Bring the thread through take up lever and pass the thread via the metal knob.

Step 9: Pass thread through metal hook and insert thread behind the guide above the needle.

Step 10: Thread the needle from left to right, by passing it through the eye hole of the needle.

Step 11: Pass the end of the thread through the presser foot, and pull it to approximately 5 cm.

Step 12: Turn the hand wheel slowly towards you until the thread from the bobbin is spooled up from the bottom of the machine by the upper thread.

Step 13: The thread should loop around the top thread in-between the needle and the feed dogs.

Sewing Practice - Procedure

Step 1: Take three fabric swatches measuring 15 x 15 cm each and mark them as Sample 1, Sample 2 and Sample 3.

Step 2: In fabric sample 1 and sample 2 draw straight line with the distance of 2 cm.

XI_EM_TDD_PRACTICALS_2022.indd 182 24-01-2023 14:09:35

Step 3: In fabric sample connect these points to form "U" shape.

Step 4: In fabric sample 3, draw circles one after the other with one cm distance in between each.

Step 5: Turn on the machine .

Step 6: Lift the presser foot and rotate the hand wheel slowly .

Step 7: Place the fabric sample 1 under the presser foot.

Step 8: Take care to match the edge of the first line with the tip of the needle.

Step9: Bring the presser foot down to fix the position of the fabric.

Step 10: Move the hand wheel and start pedalling slowly, take care to move the fabric along the lines. There should be coordination between the hand and leg movements.

Step 11: In this manner complete all the lines in the fabric sample 1.

Step 12: Place the fabric sample 2 under the presser foot following the steps carried out for the fabric sample 1.

Step 13: Move the machine to form stitches along the vertical line.

Step 14: On completion of the first vertical line leave the needle on the fabric at the edge of the line.

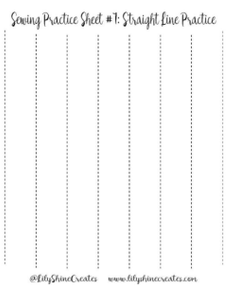
Step 15: Lift the presser foot and slowly change the direction of the fabric such that the horizontal line can be stitched.

Step 16: Lower the presser foot and start stitching till the tip of the horizontal line.

Step 17: In this manner complete all the U shaped lines in the fabric sample 2.

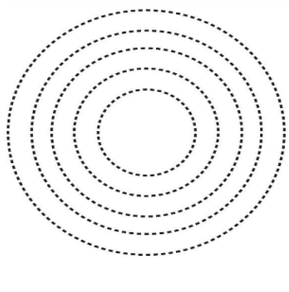
Step 18: Following the procedure of sewing the horizontal lines in the first fabric complete the sample 3.

Step 19: Care should be taken to move the fabric slowly around in a circular manner.



Fabric Sample 1 with vertical lines Remove words and lines seen on top and bottom of picture

Fabric Sample 2 with "U" shaped lines



Fabric Sample 3 with circles Remove words seen below picture

XI_EM_TDD_PRACTICALS_2022.indd 183 24-01-2023 14:09:35

Conclusion

- Understood the working on the sewing machine.
- Acquired skills in coordinating the leg and hand movements while operating the sewing.

Video Suggestions:

S.No	Title/purpose	Link
1	Sewing machine operation	https://youtu.be/UC4ci-t5M60

Simple Assessments:

Student project at home	Prepare the three samples using news paper
Guest lecture suggestions	-
Industrial/ Field visit suggestions	Visit to the nearest sewing industry to observe hand and leg coordination.

XI_EM_TDD_PRACTICALS_2022.indd 184 24-01-2023 14:09:35

PRACTICAL

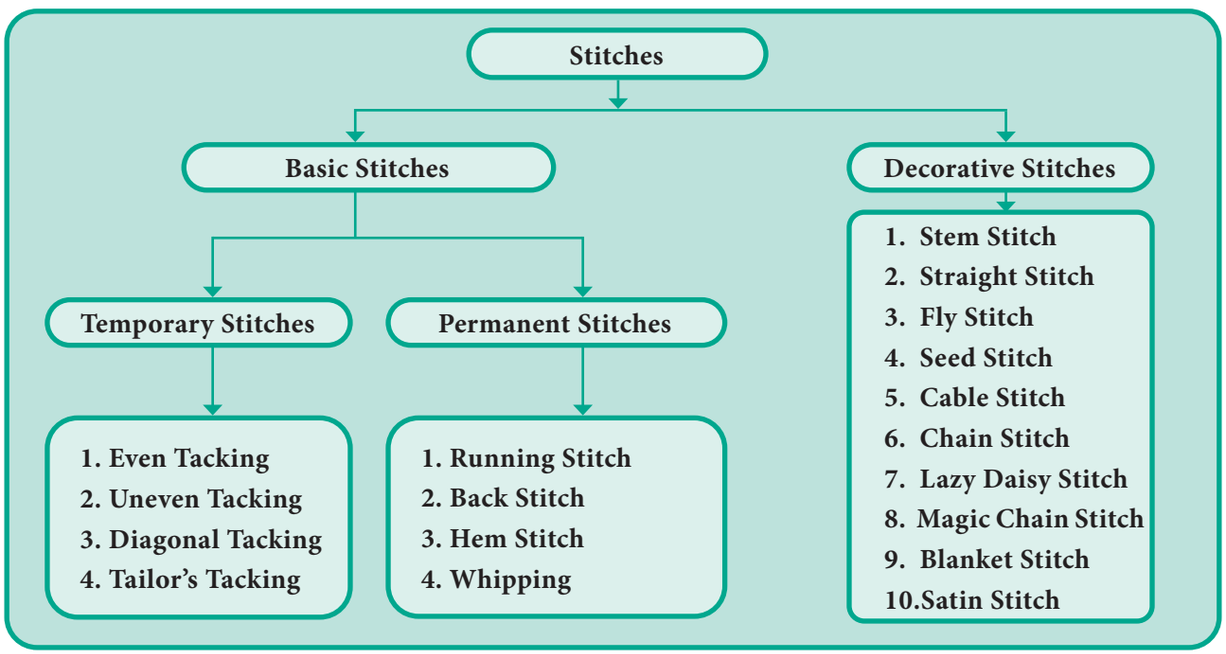
2

PREPARATION OF SAMPLES FOR BASIC AND DECORATIVE STITCHES

Objectives:

- To understand the fundamental stitches and know the difference between temporary and permanent stitches
- To gain skills in sewing basic and decorative stitches.

Operation sequence to be followed



Tools and Equipment Required

Activity Title	S. No	Name of the apparatus/ components	Range/Value	Quantity
Preparation of Sample for Basic and Decorative Stitches	1	Sewing Kit		1 Unit
	2	Fabric- Grey Cloth		1m

XI_EM_TDD_PRACTICALS_2022.indd 185 24-01-2023 14:09:35

Basic Stitches - Procedure

1. Temporary Stitches

Even Tacking

Step 1: Fold the raw edges and work the stitches from right to left.

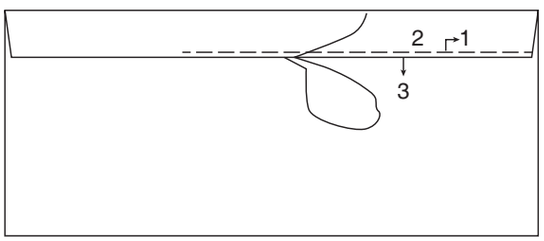
Step 2: Insert the needle from the back side of the fabric and bring it to the right side of the fabric at point 1, as shown in the figure.

Step 3: Take the needle from the front side to the back side of the fabric at point 2.

Step 4: Bring the needle from the back side to the front side by inserting it at point 3.

Step 5: Continue the steps

Note: The distance between the stitches must be even. Contrast colour thread must be used.



Even Tacking

Uneven Tacking

Step 1: Fold the raw edges and work the stitches from right to left.

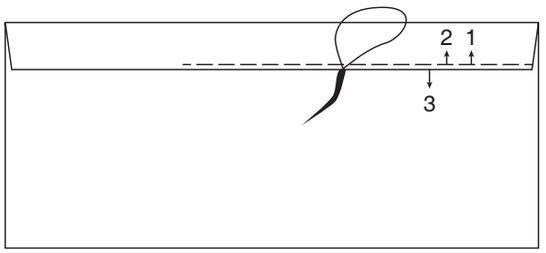
Step 2: Insert the needle from the back side of the fabric and bring it to the right side of the fabric at point 1, as shown in the figure.

Step 3: Take the needle from the front side to the back side of the fabric at point 2.

Step 4: Bring the needle to the front side of the fabric at point 3. The distance between 2 and 3 should be half distance of 1 and 2.

Step 5: Continue the steps

Note: The stitch length of the back side is half the length of the stitches in the front side. The stitches on the front side are longer than the stitches on the back side. Contrast colour thread must be used.



Uneven Tacking

Diagonal Tacking

Step 1: Fold the raw edges and work the stitches from right to left.

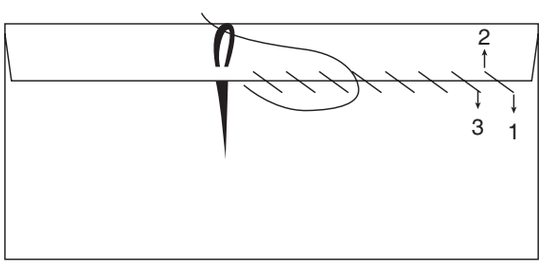
Step 2: Insert the needle from the back side to the front side of the fabric at point 1, as shown in the figure.

Step 3: Take needle diagonally to the back side of the fabric by inserting the needle at point 2 on the folded edge.

Step 4: Bring needle to the front side at point 3 just at the outer edge of the fold.

Step 5: Continue the steps.

Note: Straight stitches are seen in the back side and diagonal stitches are seen on the front side of the fabric.



Diagonal Tacking

XI_EM_TDD_PRACTICALS_2022.indd 186 24-01-2023 14:09:36

Tailor's Tacking

Step 1: Work the stitches from right to left.

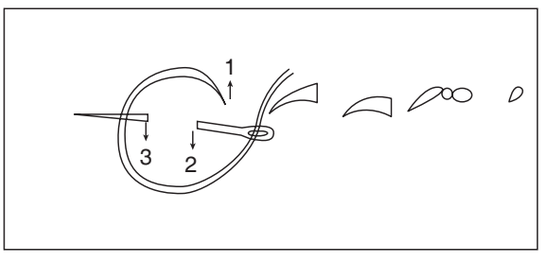
Step 2: Insert the needle from the back side of the fabric to the front side of the fabric at point 1 as shown in the figure.

Step 3: From the front side of the fabric take needle to the back side at point 2.

Step 4: Leave a loop as shown in figure and bring needle from the back side to the front side at point 3.

Step 5: Continue the steps.

Note: Maintain uniform distance between stitches.



Tailor's Tacking

2. Permanent Stitches - Procedure

Running Stitch

Step 1: Place two fabrics which have to be stitched together facing right sides.

Step 2: Draw a straight line from the raw edges at the distance of 0.5cm.

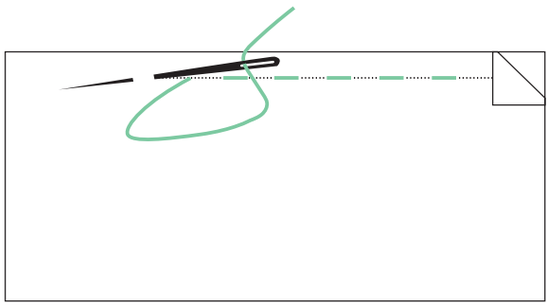
Step 3: Work the stitches from right to left.

Step 4: Insert the needle from the back side to the front side on the edge of the drawn line.

Step 5: Make a small stitch along the line and insert the needle to the back side of the fabric.

Step 6: Continue the steps.

Note: The stitch length must be even on the front and back side of the fabric. Use matching colour thread.



Running Stitch

Back stitch

Step 1: Place two fabrics which have to be stitched together facing right sides.

Step 2: Draw a straight line from the raw edges at the distance of 0.5cm.

Step 3: Work the stitches from right to left.

Step 4: Insert the needle from the back side to the front side at point 1 which is about 0.5 cm from the edge of the drawn line.

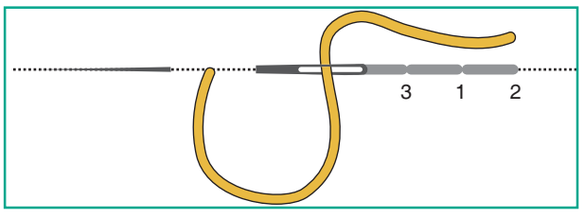
Step 5: Again bring needle from the front side to the back side at point 2 (which is marked to the right hand side of the point 1) as shown in the figure.

Step 6: Bring the needle to the front side by inserting it at point 3 from point 2 as shown in the figure.

Step 7: Continue the steps.

XI_EM_TDD_PRACTICALS_2022.indd 187 24-01-2023 14:09:36

Note: Back stitches are even and look like machine stitches.



Back Stitch

Hem Stitch

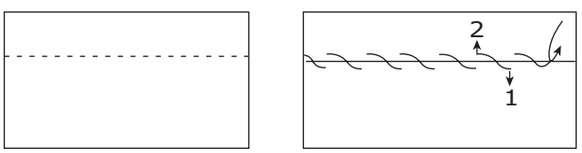
Step 1: Fold the raw edges and work the stitches from right to left.

Step 2: Insert the needle from the back side to the front side of the fabric at point 1, as shown in the figure.

Step 3: Insert the needle from the front side to the back side at point 2 making a small tiny slanting stitch.

Step 4: Continue the steps.

Note: Stitches look diagonal on the front side of the fabric.



Hem stitch

Whipping Stitch

Step 1: Roll the raw edges and work the stitches from left to right.

Step 2: Insert the needle from the back side to the front side of the fabric at point 1 diagonally over the rolled edge as shown in the figure.

Step 3: Take the needle from the front side over the rolled edge and insert the needle at point 2 at back side of the fabric.

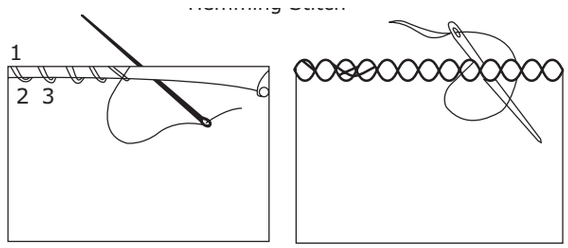
Step 4: From front side of the fabric by inserting the needle at point 3 following step 2.

Step 5: Continue the work till the end of the fabric.

Step 6: Repeat the steps 1, 2 and 3 so that stitches are made from the right hand side to the left hand side over the stitches which are already made.

Step 7: Continue the steps by sewing till point 1.

Note: Stitches look like alphabet "X". The rolled edges must be as narrow as possible.



Whipping Stitch

3. Decorative Stitch - Procedure

Stem Stitch

Step 1: Draw the line or design which has to be completed with stem stitch.

Step 2: Insert the needle from the back side to the front side at point 1 as shown in the figure.

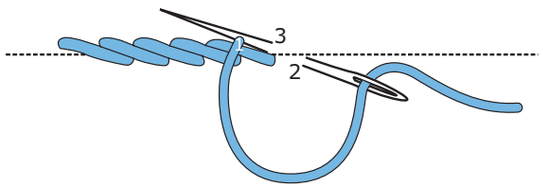
Step 3: Take the needle from the front side to the back side of the fabric from at point 2 making a small slanting stitch, as shown in the figure.

XI_EM_TDD_PRACTICALS_2022.indd 188 24-01-2023 14:09:36

Step 4: Bring the needle from the back side to the front side of the fabric at point 3, which is half the distance between the points 1 and 2.

Step 5: Continue the work till the end of the line or design.

Note: Length of all the stitches should be same.



Stem Stitch

Straight Stitch

Step 1: Draw the line or design which has to be completed with straight stitch.

Step 2: Insert the needle from the back side of the fabric to the front side at point 1 as shown in the figure.

Step 3: Take the needle from the front side of the fabric to the back side at point 2 as shown in the figure.

Step 4: Again take needle from the back side to the front side at point 3 and insert the needle at point 4 from the front side to the back side of the fabric, as shown in the figure.

Step 5: Continue the steps

Note: Work in same direction, for e.g. Bottom to top or from top to bottom.

Straight Stitch

Fly Stitch

Step 1: Draw the line or design which has to be completed with fly stitch.

Step 2: Insert the needle from the back side of the fabric to the front side at point 1.

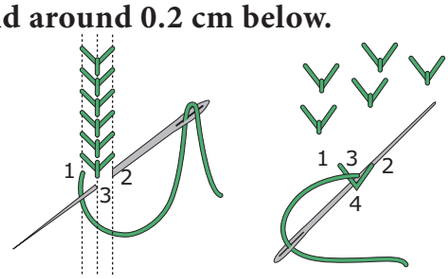
Step 3: Take the needle from the front side to the back side of the fabric at point 2 leaving the thread under the needle to form a loop, as shown in the figure.

Step 4: Bring the needle from the back side to the front side of the fabric at point 3. Take care to pass the needle above the loop.

Step 5: Insert the needle just below at point 3, making a small stitch and take the needle to the back side of the fabric.

Step 6: Continue the step

Note: Stitches look like alphabet "Y". Point 3 is always in-between point 1 and 2 and around 0.2 cm below.



Fly Stitch

XI_EM_TDD_PRACTICALS_2022.indd 189 24-01-2023 14:09:36

Seed Stitch

Step 1: Draw the line or design which has to be completed with seed stitch.

Step 2: Insert the needle from the back side of the fabric to the front side at point 1.

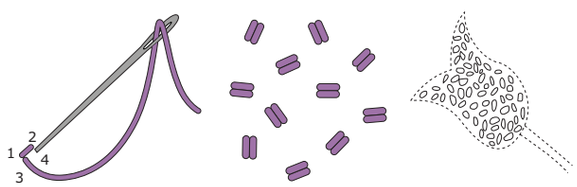
Step 3: Take the needle from the front side to the back side of the fabric at point 2 making a tiny stitch.

Step 4: Bring the needle from the back side to the front side of the fabric at point 3.

Step 5: Insert the needle at point 4 and take it to the back side of the fabric, making a tiny stitch adjacent to the stitch already made at point 1 and 2.

Step 6: Continue the steps.

Note: Stitches look like two tiny straight lines close to each other.



Seed Stitch

Cable Stitch

Step 1: Draw the line which has to be completed with cable stitch.

Step 2: Mark 4 points on the line as 1, 2, 3 and 4 as shown in the figure.

Step 3: Insert the needle from the back side to the front side of the fabric at point 1.

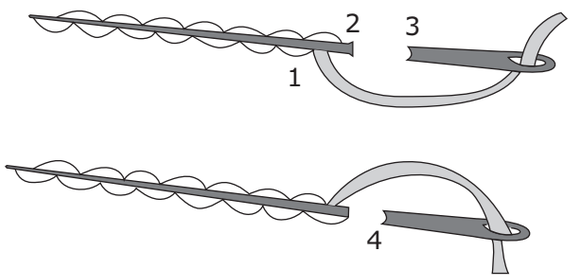
Step 4: Take the needle from the front side to the back side of the fabric at point 3. Take care to form the stitch below the drawn line.

Step 5: Bring the needle to the front side of the fabric by inserting the needle at point 2 which is marked in between the points 1 and 3. Keep the thread above the drawn line.

Step 6: Complete the stitch by inserting the needle from the front side to the back side of the fabric at point 4.

Step 7: Continue the steps.

Note: Stitch looks like a small curve above and below a drawn line.



Cable Stitch

Chain Stitch

Step 1: Draw the line or design which has to be completed with chain stitch.

Step 2: Insert the needle from the back side of the fabric to the front side at point 1.

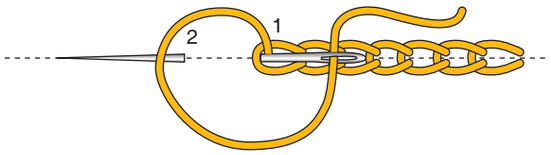
Step 3: Insert the needle at the same point 1 and take it out at point 2 as shown in the figure. Keep the thread below the needle.

Step 4: The thread below the needle forms a loop. Pull the needle gently.

Step 5: Continue the steps.

XI_EM_TDD_PRACTICALS_2022.indd 190 24-01-2023 14:09:37

Note: Stitches look like a row of circles closely arranged.



Chain Stitch

Lazy Daisy Stitch

Step 1: Draw the line or design which has to be completed with lazy daisy stitch.

Step 2: Insert the needle from the back side to front side of the fabric at point 1

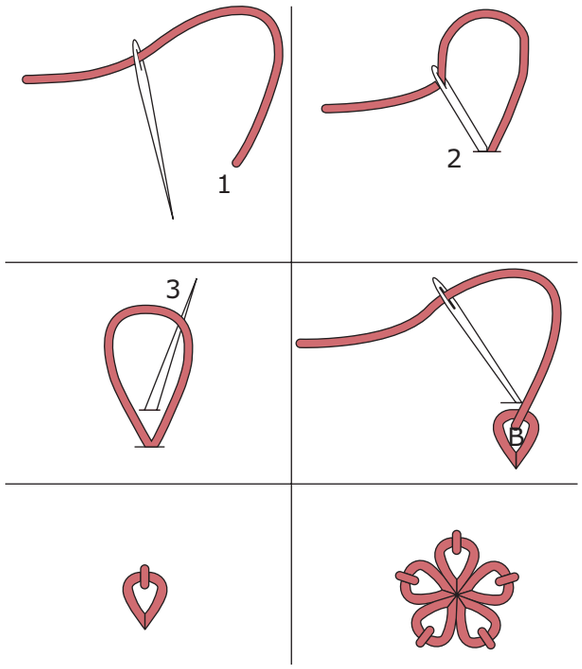
Step 3: Insert the needle back at the position close to point 1 from the front side of the fabric at point 2.

Step 4: Wind the thread from the left hand side to the right hand side below the needle and pull the needle gently to the front side of the fabric at point 2 to form a loop.

Step 5: To lock the loop,insert the needle from the right side of the fabric at point 3 and take the needle to the back side of the fabric. This forms a small stitch over the edge of the loop.

Step 6: Continue the steps

Note: Stitches looks like a single chain stitch with a tiny straight stitch at the top. If the stitches are done in a circular manner it looks like a flower.



Lazy Daisy Stitch

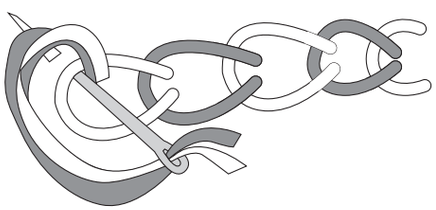
Magic Chain Stitch

Step 1: Draw the line or design which has to be completed with Magic chain stitch.

Step 2: Follow the steps used for stitching chain stitch.

Step 3: Use two colour threads alternatively for making the chain stitch.

Note: Stitches look like circles of two colours arranged alternatively.



Magic Chain Stitch

XI_EM_TDD_PRACTICALS_2022.indd 191 24-01-2023 14:09:37

Blanket Stitch

Step 1: Draw the line or design which has to be completed with blanket stitch.

Step 2: Insert the needle from the back side to the front side of the fabric at point 1.

Step 3: Take the needle to the back side of the fabric at point 2.

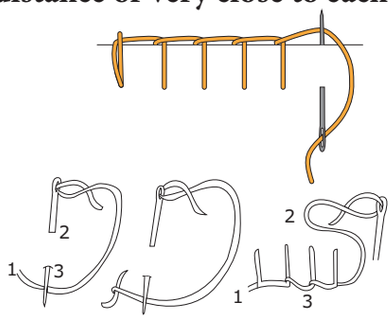
Step 4: Before pulling the thread keep it parallel to point 1.

Step 5: Now bring the needle from the back side to the front side of the fabric at point 3.

Step 6: The thread forms a loop around the needle.

Step 7: Continue the steps.

Note: Stitches looks like a row of "U" shaped alphabets arranged one after the other. These stitches can be worked at equal distance or very close to each other.



Blanket Stitch

Satin Stitch

Step 1: Draw the line or design which has to be completed with satin stitch.

Step 2: Insert the needle from the back side to the front side of the fabric at point 1.

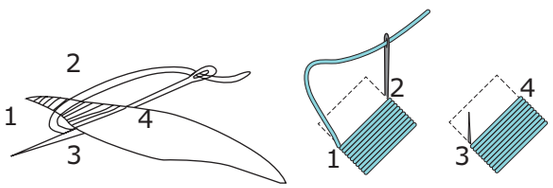
Step 3: Take the needle from the right side of the fabric to the back side at point 2.

Step 4: Bring the needle from the back side to the front side of the fabric at point 3.

Step 5: Take the needle from the right side of the fabric to the back side at point 4.

Step 6: Continue the steps.

Note: Stiches looks similar on the front and back side of the fabric.



Satin Stitch

Conclusion

- Understood the different types of stitches and their applications in various apparels.
- Gained skills in sewing basic and decorative stitches.

Video Suggestions:

S.No	Title/purpose	Link
1	Basic stitches	https://youtu.be/kKnBUa4l2k4

Simple Assessments:

Student project at home	Complete a scarf or table cover with suitable decorative stitches
Guest lecture suggestions	Conduct workshop on decorative stitches
Industrial/ Field visit suggestions	-

XI_EM_TDD_PRACTICALS_2022.indd 192 24-01-2023 14:09:37

PRACTICAL

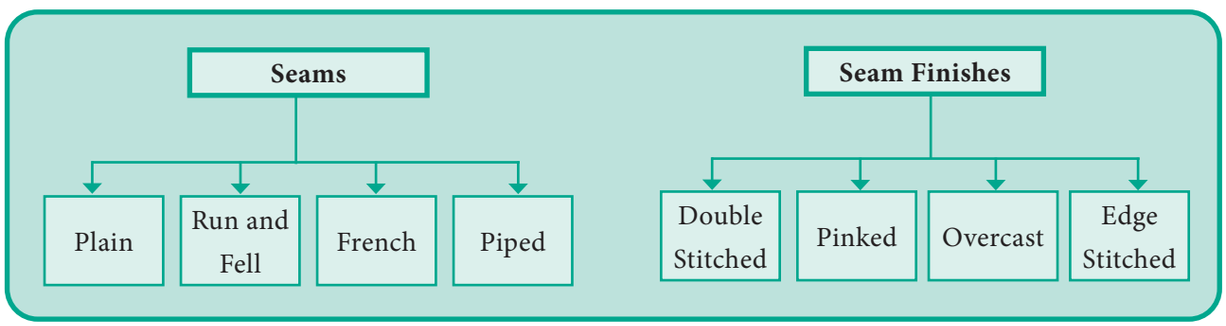
3

PREPARATION OF SAMPLES FOR SEAMS AND SEAM FINISHES

Objectives:

- To understand the basic seams and seam finishes
- To acquire knowledge on the construction of various seams and seam finishes.
- To gain skill on the application of different seam finishes

Operation sequence to be followed



Tools and Equipment Required

Activity Title	S. No	Name of the apparatus/ components	Range/Value	Quantity
Preparing Sample for Seams and Seam Finishes	1	Sewing machine	Industrial sewing machine	1
	2	Sewing kit	-	1 Unit
	3	Pinking shears	-	1

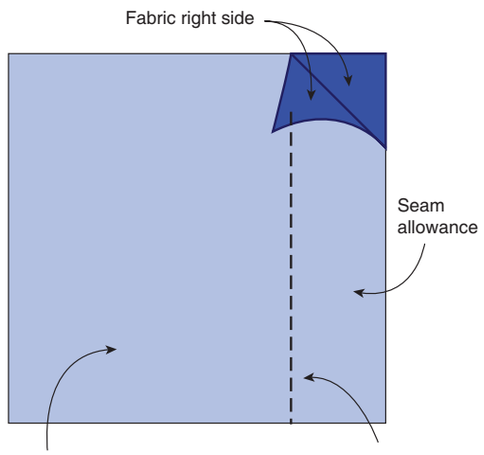
1. Seams - Procedure

Plain Seam

Step 1: Take two pieces of fabric which has to be joined together and place them facing right sides to each other

Step 2: Check if the seam lines match each other

Step 3: Pin along the seam lines to avoid misalignment of samples



Plain seam

XI_EM_TDD_PRACTICALS_2022.indd 193 24-01-2023 14:09:37

Step 4: Tack along the seam line and remove the pins

Step 5: Hand stitch or machine stitch are made on the seam line

Step 6: Remove tacking and trim the extra threads.

Step 7: Press the seam firmly.

Run and Fell Seam

Step 1: Mark the seam lines (stitching line) on the back side of the fabric

Step 2: Place two pieces to be sewn together facing right sides.

Step 3: Match the seam lines

Step 4: Tack the two pieces on the seam line in order to avoid misalignment.

Step 5: Give a row of machine stitch on seam line.

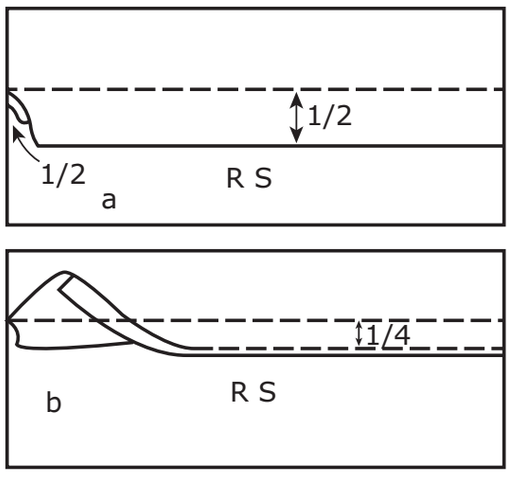
Step 6: Trim the under piece seam allowance by 0.25 cm from the edge

Step 7: Turn the upper piece seam allowance to make a smooth fold over the under piece trimmed edge.

Step 8: Press down the folded edges firmly.

Step 9: Stitch close to the folded edge on the right side of the fabric.

Step 10: Press the seam firmly.



Run and Fell Seam

French Seam

Step 1: Mark the seam lines on the back side of the fabric

Step 2: Place two pieces to be sewn together facing wrong sides.

Step 3: Match the seam lines

Step 4: Work a row of stitches about 0.5 cm outside the seam line nearer to the raw edges.

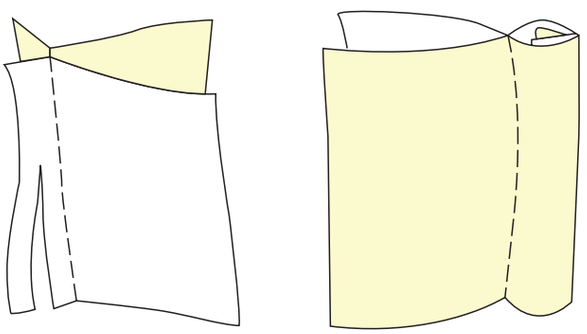
Step 5: Trim the allowances.

Step 6: Turn the seam to the right side and press firmly.

Step 7: Fold and pin about 0.5 cm along the seam line

Step 8: Make a row of stitches along the folded seam line

Step 9: Press the French seam firmly



French Seam

XI_EM_TDD_PRACTICALS_2022.indd 194 24-01-2023 14:09:38

Piped Seam

Step 1: Mark the seam lines on the back side of the fabric

Step 2: Place two pieces to be sewn together facing wrong sides.

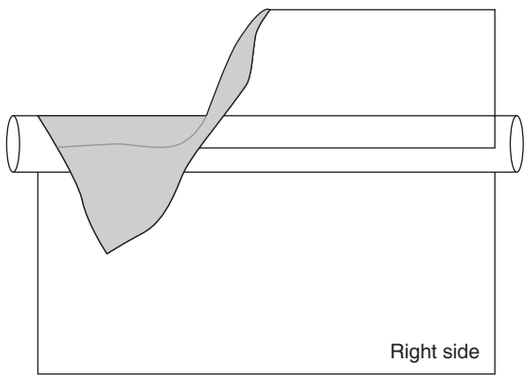
Step 3: Match the seam lines

Step 4: Keep both the fabric to be stitched as done for sewing plain seam.

Step 5: Insert a folded bias strip in-between the plain seam.

Step 6: Finish raw edges of seam with a row of stitch.

Step 7: Press the piped seam firmly



Piped Seam

2. Seam Finishes – Procedure

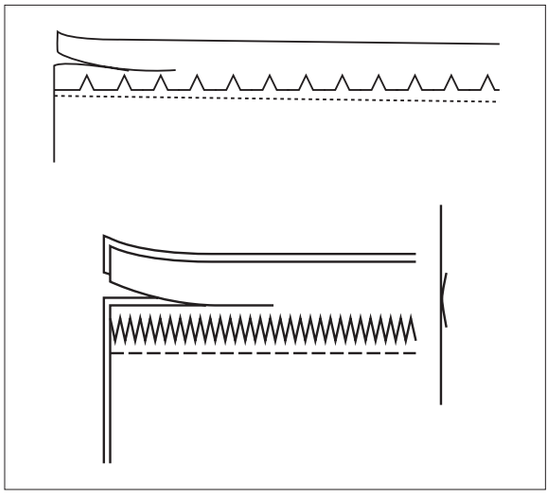
Double Stitch Seam Finish

Step 1: Attach both the fabric with the plain seam.

Step 2: Make a row of stitches about 0.25 cm away from the original seam.

Step 3: Turn the seams to the right side and press neatly.

Note: This stitch can be straight stitch or Zig-Zag stitch.



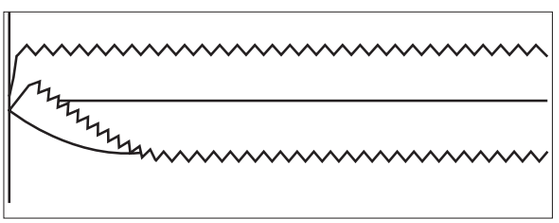
Double Stitch Seam Finish

Pinked Seam Finish

Step 1: Attach both the fabric with the plain seam.

Step 2: Trim the raw edges of the seams with the pinking shears.

Step 3: Turn the seams to the right side and press neatly.



Pinked Seam Finish

Overcast Stitch Seam Finish

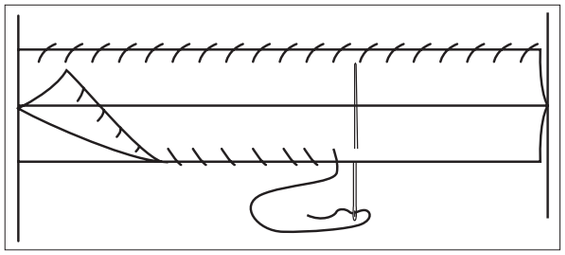
Step 1: Attach both the fabric with the plain seam.

Step 2: Turn to the wrong side and press both the edges separately.

Step 3: Make over cast stitches on the edges.

Step 4: Press the seams neatly.

XI_EM_TDD_PRACTICALS_2022.indd 195 24-01-2023 14:09:38



Overcast Stitch Seam Finish

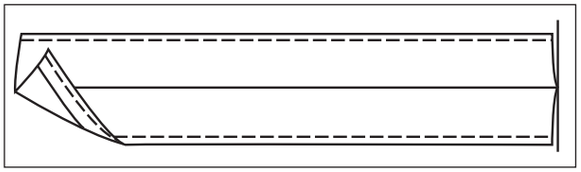
Edge Stitch Seam Finish

Step 1: Attach both the fabric with the plain seam.

Step 2: Turn to the wrong side and press both the raw edges separately.

Step 3: Fold 0.5 cm down and make a row of top stitch on the raw edges without attaching the fabric to the garment.

Step 4: Turn the seams to the right side and press neatly.



Edge Stitch Seam Finish

Conclusion

- Gained skills in constructing different types of seams and seam finishes.

Video Suggestions:

S.No	Title/purpose	Link
1	Basic seams	https://youtu.be/K27m4KfNUWE
2	Types of seam finishes	https://youtu.be/q-gIrh6hJxw

Simple Assessments:

Student project at home	Construct a plain seam using newspaper and finish it with pinked seam finish.
Guest lecture suggestions	–
Industrial/ Field visit suggestions	–

XI_EM_TDD_PRACTICALS_2022.indd 196 24-01-2023 14:09:38

PRACTICAL

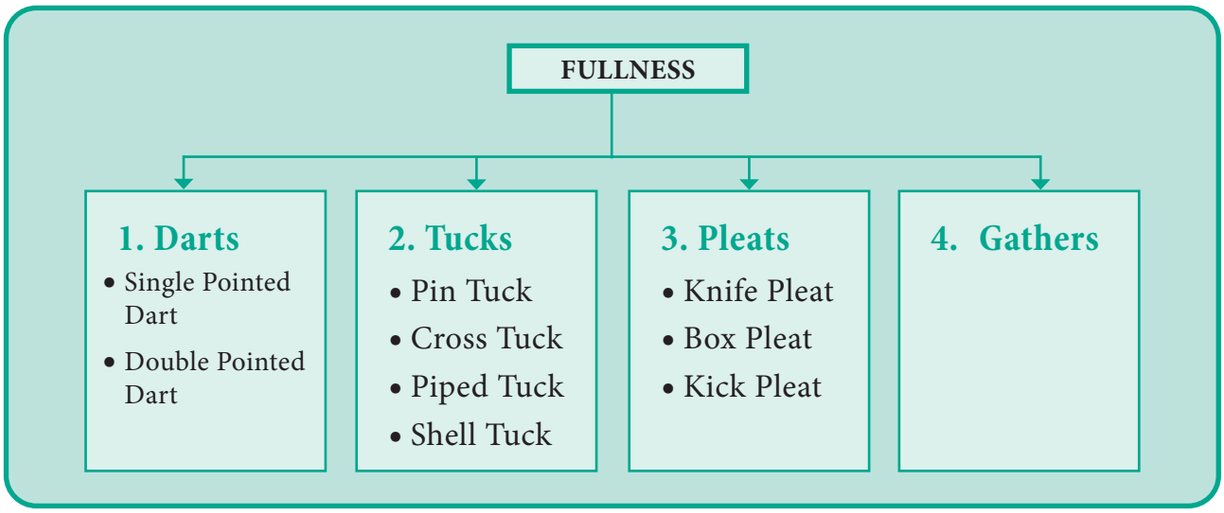
4

PREPARATION OF SAMPLE FOR VARIOUS TYPES OF FULLNESS

Objectives:

- To understand about the various types of fullness used in garments
- To know about the right place in the garment to apply fullness

Operation sequence to be followed



Tools and Equipment Required:-

Activity Title	S. No	Name of the apparatus/ components	Range/Value	Quantity
Darts Tucks	1	Sewing machine	Industrial sewing machine	1
Pleats Gathers	2	Sewing kit	-	1 Unit

XI_EM_TDD_PRACTICALS_2022.indd 197 24-01-2023 14:09:38

1. Darts - Procedure

Single Pointed Dart

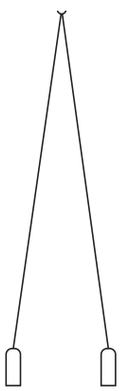
Step 1: Mark points where darts are to be sewn.

Step 2: Fold the fabric between two points of wider edge on the right side facing each other.

Step 3: Start machining from the wider end and taper till the tip point.

Step 4: Secure the stitches, trim the loosen threads at the tapering end.

Step 5: Press the dart neatly



Single Pointed Dart

Double Pointed Dart

Step 1: Mark points where darts are to be sewn.

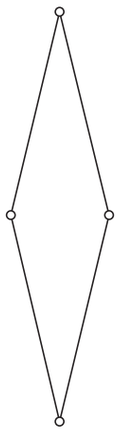
Step 2: Fold the fabric between two points of wider edge on the right side facing each other.

Step 3: Start machining from the wider end to the narrow end of one tip.

Step 4: Repeat the same procedure for stitching the other side of the dart

Step 5: Repeat the same procedure for stitching the other side of the dart

Step 6: Press the dart neatly.



Double Pointed Dart

2. Tucks – Procedure

Pin Tuck

Step 1: Mark the points where pin tucks are to be sewn.

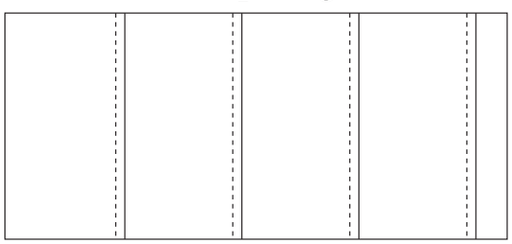
Step 2: Draw vertical lines from the marked points leaving 0.25cm

Step 3: Fold and stitch along the marked line

Step 4: Repeat the same procedure for subsequent lines.

Step 5: Trim the extra threads.

Note: Care should be taken to mark the pin tucks at even spacing.



Pin Tuck

Cross Tuck

Step 1: Mark the points where cross tucks are to be sewn.

XI_EM_TDD_PRACTICALS_2022.indd 198 24-01-2023 14:09:38

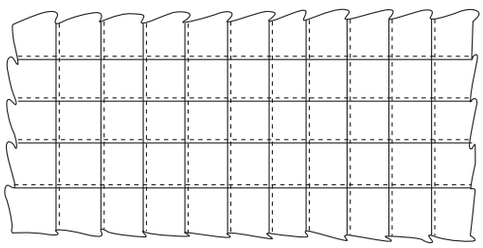
Step 2: Draw vertical and horizontal lines from the marked points.

Step 3: Stitch the tucks in vertical direction

Step 4: Then stitch tucks in the horizontal direction

Step 5: Trim the extra threads.

Note: Care should be taken to mark the cross tucks at even spacing.



Cross Tuck

Piped Tuck

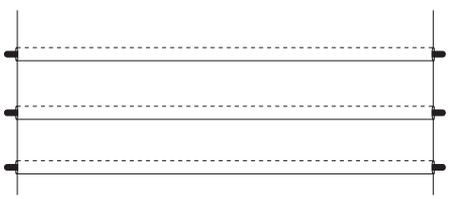
Step 1: Mark the places where piped tuck is necessary.

Step 2: Place a cord on the wrong side, overlap and stitch near the cord, such that the cord is inside like a tube.

Step 3: Repeat the process.

Step 4: Trim the extra threads.

Note: Care should be taken to mark the piped tucks at even spacing.



Piped Tuck

Shell /Scalloped Tuck

Step 1: Mark the points where shell tucks are to be sewn .Fold the edge to 0.25cm.

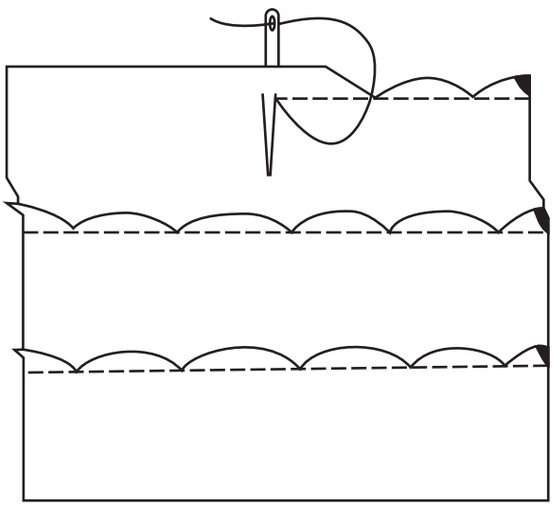
Step 2: Mark and pin 1 cm apart, make sure that scallops are of equal width.

Step 3: Start with 2 or 3 running stitch till the pin to start the scallop.

Step 4: Do overcasting stitch by pulling the thread to create a scallop effect.

Step 4: Trim the extra threads.

Note: Care should be taken to mark the shell tucks at even spacing.



Shell /Scalloped Tuck

3. Pleats – Procedure

Knife Pleat

Step 1: Draw the sewing line and mark the points where pleats are to be made.

Step 2: Fold along the marked point and pin

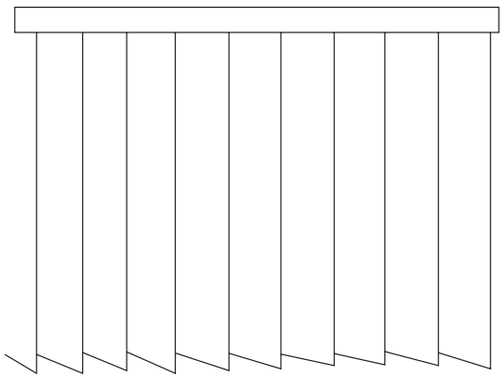
Step 3: Press and sew along the marked sewing line.

Step 4: Remove pins.

Step 5: Trim the extra threads.

XI_EM_TDD_PRACTICALS_2022.indd 199 24-01-2023 14:09:39

Note: Care should be taken to mark the knife pleats at even spacing.



Knife Pleat

Box Pleat

Step 1: Draw the sewing line and mark points where box pleats are to be made.

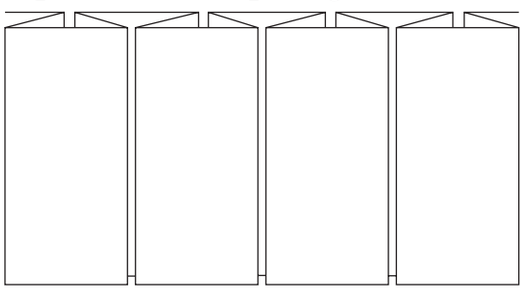
Step 2: First make fold in right hand side and make the other pleat on left hand side, repeat the process.

Step 3: Pin and press

Step 4: Remove pins and give a stitch.

Step 5: Trim the extra threads.

Note: Care should be taken to mark the box pleats at even spacing.



Box Pleat

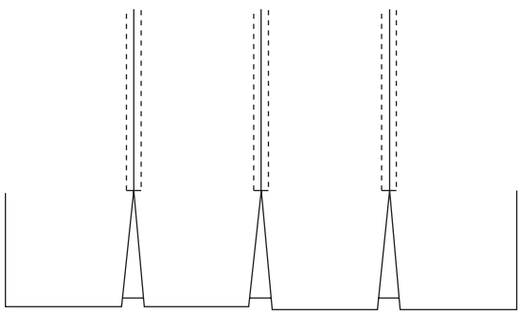
Kick Pleat

Step 1: First mark a plain box pleat as per requirement.

Step 2: Stitch pleat separately by sewing vertically downwards till the required length and sew back upwards to the end of the pleat. Repeat the process.

Step 3: Trim the extra threads.

Note: Care should be taken to mark the kick pleats at even spacing.



Kick Pleat

4. Gathers – Procedure

Step 1: Draw three lines where gathers are to be made

Step 2: Stitch three rows of loose machine stitches on the marked line.

Step 3: Gather the fabric by pulling the bobbin thread as shown in the picture.

Step 4: Pin only the edges on the flat surface.

Step 5: Evenly spread gathers over the fabric.

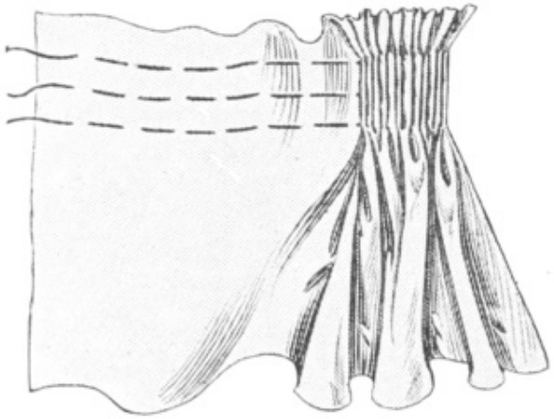
Step 6: Pin the gathers to the fabric.

Step 7: Machine stitch horizontally and remove the pins.

Step 8: Trim the extra threads.

XI_EM_TDD_PRACTICALS_2022.indd 200 24-01-2023 14:09:39

Note: Care should be taken to mark the gathering lines at even spacing.



Gathers

Conclusion

- Understood the different types of fullness and their applications in various apparels
- Gained skills in construction of different types of fullness.

Video Suggestions:

S.No	Title/purpose	Link
1	Types of fullness	https://youtu.be/yQmmlOfRbg8

Student project at home	Using craft papers make samples of any 5 type of fullness
Guest lecture suggestions	–
Industrial/ Field visit suggestions	Visit to brand show rooms to note the application of fullness in apparels.

XI_EM_TDD_PRACTICALS_2022.indd 201 24-01-2023 14:09:39

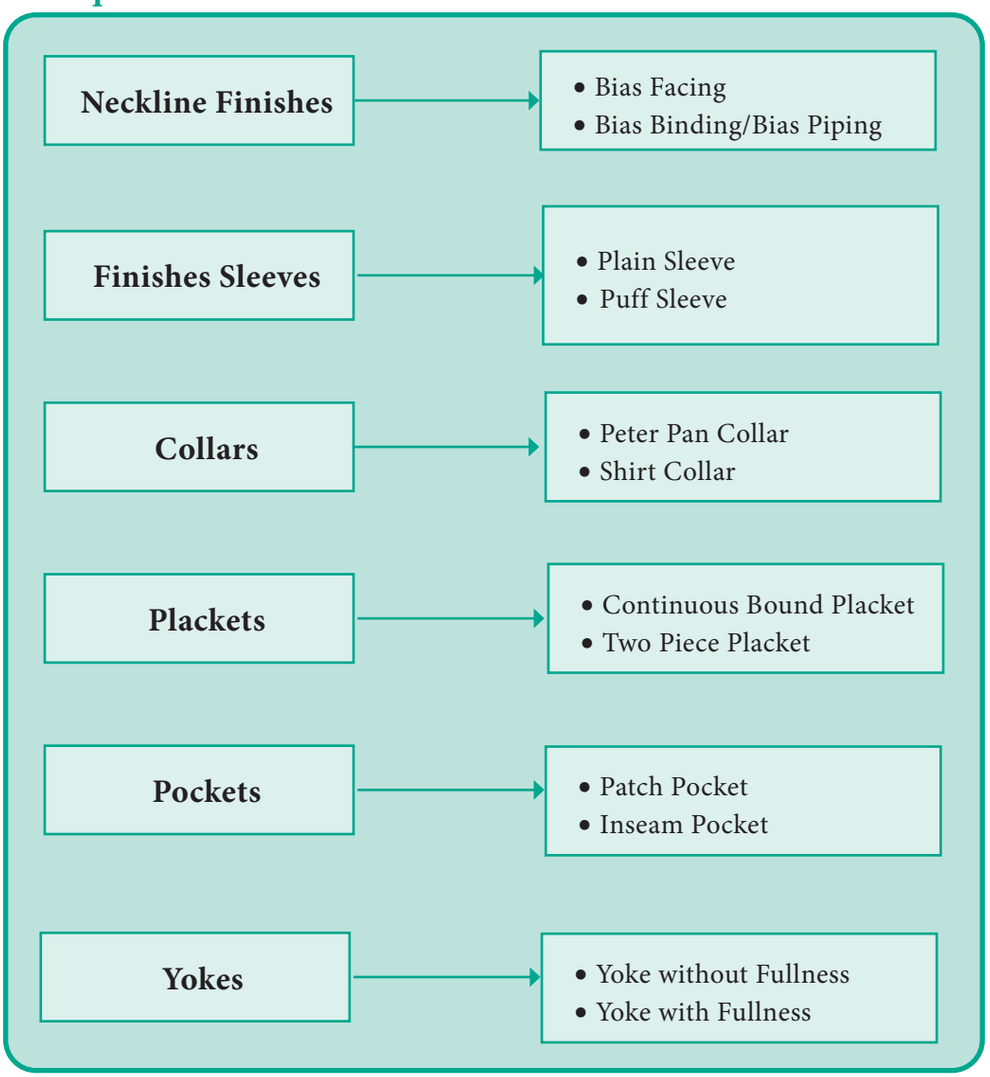
PRACTICAL

5 PREPARATION OF SAMPLE FOR TYPES OF GARMENT COMPONENTS

Objectives:

- To understand the style of garment components –Necklines, Sleeves, Collars, Plackets, Yokes and Pockets in dress designing.
- To acquire skill in the construction of basic garment components

Operation sequence to be followed



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Tools and Equipment Required:-

Activity Title	S.No	Name of the apparatus/components	Range/Value	Quantity
Necklines Sleeves Collars Plackets Pockets Yokes	1.	Sewing kit	-	1
	2.	Sewing machine	-	1
	3.	Poplin cloth ,Interlining canvas	-	1 Meter Each
	4.	Brown sheet/Newspaper, Zip	-	One of each

1 Necklines – Procedure

Bias facing

Step 1: Take a sample fabric of 10x10cm.

Step 2: Draw the required neckline on the sample fabric swatch of 10x10 cm.

Step 3: Cut a bias strip measuring 2.5cm width and 2 cm length more than the length of the neckline.

Step 4: Keep the bias strip on the sample fabric along the neckline right side facing each other.

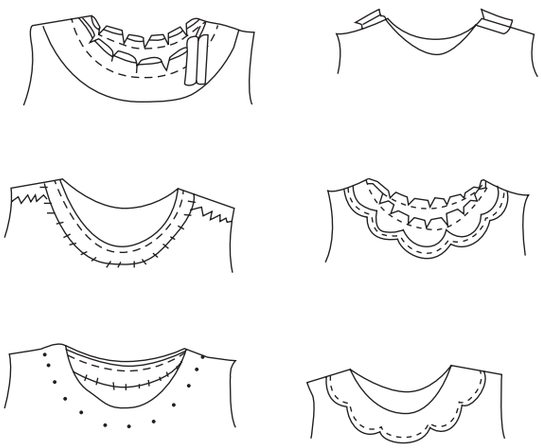
Step 5: Make a row of stitches along the neckline. Take care to keep the sample fabric and bias strip together.

Step 6: Turn bias strip to the wrong side and fold to 0.25cm.

Step 7: Keep folded edge of the strip, crease well and place it on the wrong side of the fabric.

Step 6: Stitch or hem the facing to the fabric.

Step 7: Press the stitched sample.



Bias facing

Bias Binding/Piping

Step 1: Take a sample fabric of 10x10cm.

Step 2: Draw the required neckline on the sample fabric swatch of 10x10 cm.

Step 3: Cut a bias strip measuring 2.5 cm width and length 2 cm more than the length of the neckline.

Step 4: Keep the bias strip on the sample fabric along the neckline right side facing each other.

XI_EM_TDD_PRACTICALS_2022.indd 203 24-01-2023 14:09:39

Step 5: Fold the bias strip leaving 0.5 cm on the right side of the sample fabric along the neckline.

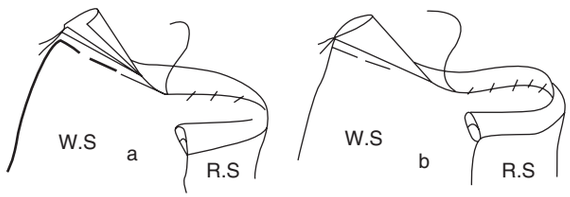
Step 6: Fold the raw edges of the bias strip and match it along the neckline.

Step 7: Make a row of stitches on the stitching line.

Step 8: Secure the ends of the stitching lines.

Step 9: Iron the stitched sample.

Note: The finished binding is seen on the either side of the fabric. It should have uniform width



Bias Binding/Piping

2. Sleeves - Procedure

Plain Sleeve

Step 1: Prepare and cut a sleeve pattern to match quarter scale bodice front and back pattern.

Step 2: Fold the sleeve, mark and cut the center notch for joining the shoulder seam

Step 3: Join bodice front and back patterns at shoulder seam and join side seam of the bodice.

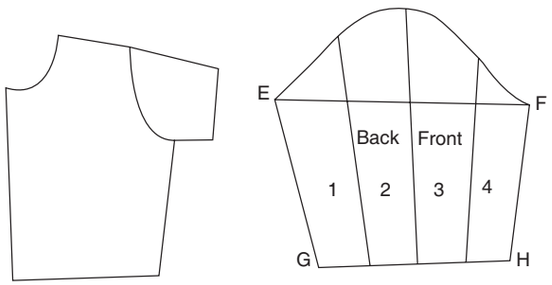
Step 4: Machine the sleeve hemline by folding 1cm.

Step 5: Match the notches marked in the sleeve pattern with the bodice front and back, right side facing right side.

Step 6: Start stitching from center of the armscye. First stitch the front sleeve cap to the front bodice pattern, then stitch the back sleeve cap to the back bodice pattern.

Step 7: Stitch side seam of the sleeve and secured the ends.

Step 8: Trim the hanging threads and press the sleeve pattern.



Plain Sleeve

Puff Sleeve

Step 1: Prepare and cut a sleeve pattern to match quarter scale bodice front and back pattern.

Step 2: Match the notches marked in the sleeve pattern with the bodice front and back, right side facing right side.

Step 3: Along the armscye and hemline mark points to divide the sleeve into 4 equal parts. Join these points vertically and mark the parts as 1, 2, 3 and 4.

Step 4: Cut along the lines.

Step 5: Place the cut parts on a brown sheet and spread it apart leaving 2.5 to 5 cm at top and bottom.

Step 6: Trace the outline on the brown sheet and cut final pattern.

XI_EM_TDD_PRACTICALS_2022.indd 204 24-01-2023 14:09:39

Step 7: Transfer the final pattern on to fabric and cut the sleeve pattern.

Step 8: Finish the hemline of the sleeve with a row of machine stitches.

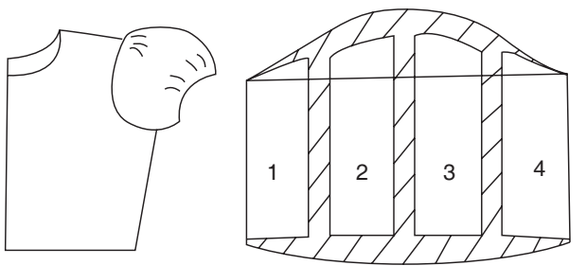
Step 9: Adjust the stitch regulator at 5 to produce 5 stitches for 2.5 cm.

Step 10: Machine along the sleeve cap and hem line, leaving atleast 4-5 cm extra thread on the edges.

Step 11: Hold the bobbin thread stitched at the hemline, on one side of the sleeve and pull gently to form gathers at the hemline.

Step 12: Repeat step 9 holding the bobbin thread at the sleeve cap to form gathers at the sleeve cap.

Step 13: Follow the steps 5, 6, 7 and 8 given in plain sleeve and complete the gathered sleeve.



Puff Sleeve - Gathers at Top and Bottom

3. Collars - Procedure

Peter Pan Collar

Drafting Procedure

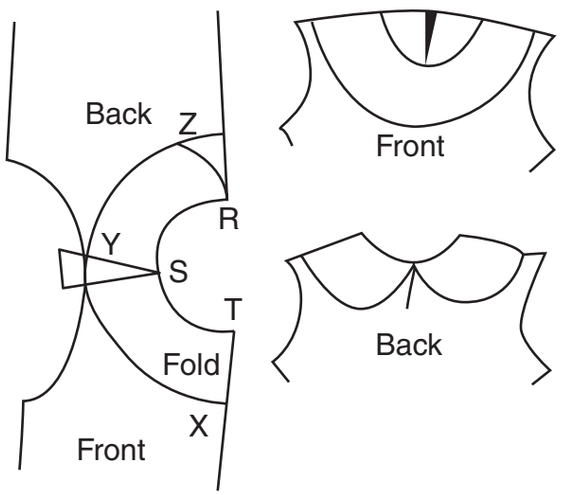
Step 1: Trace the neckline from front and back bodice patterns.

Step 2: Place the bodice back down with the shoulder line matching and touching with the pattern overlapping 0.25cm near the shoulder line as shown in the figure.

Step 3: Trace the outline of the upper bodice patterns and label the front neckline as "Y" for shoulder, "R" for back neck line and "T" for front neckline.

Step 4: Mark points X, Y, Z measuring 3 to 7 cm away from the neckline parallel to points T, S, R. The back collar pattern can be shaped as per requirement at point Z.

Step 5: Label the collar as shown in the figure and cut the collar pattern with seam allowances.



Peter Pan Collar

Sewing Procedure

Step 1: Place the collar pieces right side facing each other and machine along the sides and outer edge of the collar, slash 0.2 cm along the curved lines and turn the collar pattern. Press firmly along the stitched lines.

XI_EM_TDD_PRACTICALS_2022.indd 205 24-01-2023 14:09:40

Step 2: Match the neckline of the collar with the neckline of the front and back bodice patterns.

Step 3: Stitch around the collar from center back to front and repeat to complete the collar on the opposite direction.

Step 4: Take care to match the center front of the collar pattern to match the center front of the bodice pattern and finish the raw edges of the neckline using a bias facing.

Step 5: Secure the stitches, trim the loose threads and press the collar pattern neatly.

Shirt Collar

Drafting Procedure

Step 1: Draw a rectangle ABCD

Step 2: AB=1/2 neck measurement

Step 3: BC= width of the collar + 5 cm for band width.

Step 4: Label BC as center back line (on fold)

Step 5: Mark points CE and DF = Band width (5 cm)

Step 6: Extend point D-D_1 = 2 cm

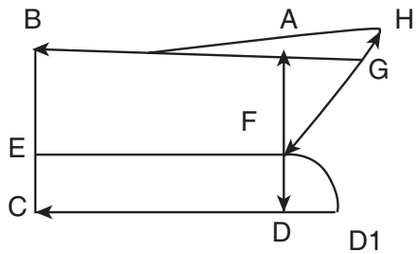
Step 7: Join D_1-F and shape as shown in figure.

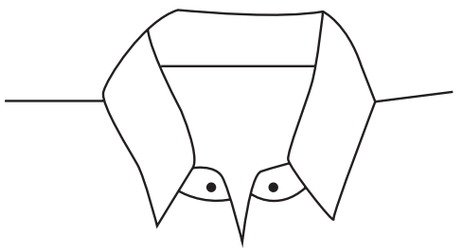
Step 8: Extend point A to H = 4 cm (Diagonally), as shown in the figure.

Step 9: Mark a point G diagonally from H = 1 cm, as shown in the figure.

Step 10: Shape point H for collar tip.

Step 11: Join the points B-E-C-D-D_1-F-H-B, as shown in the figure.





Shirt Collar

Sewing Procedure

Step 1: Trace the collar pattern without the band onto a fusing canvas material.

Step 2: Cut the canvas material and place it on the wrong side of the collar part and press using a steam iron. Take care to mark and cut the collar pattern without seam allowance.

Step 3: Place both the collar patterns right side facing each other. Finish collar outer part along with the band with the row of machine stitches.

Step 4: Make small slashes along the seam allowances press firmly and turn the collar pattern.

Step 5: Shape the points of the collar edges using a bodkin (A small equipment with the blunt

XI_EM_TDD_PRACTICALS_2022.indd 206 24-01-2023 14:09:40

edge used for shaping tips or inserting cord/tape)

Step 6: Give a row of stitches along the collar edges leaving 0.5 cm to enhance the look of the collar.

Step 7: Join the front and back bodice pattern at the shoulder line

Step 8: Finish the center front openings of the front bodice pattern.

Step 9: Match the neckline of the collar with the neckline of the front and back bodice patterns.

Step 10: Stitch around the collar from center back to front and repeat to complete the collar on the opposite direction.

Step 11: Fold the lower raw edge of the collar over the finished neckline and neatly hand tack. Take care to maintain the shape of the neckline.

Step 12: Make a row of machine stitches along the hand tacked line.

Step 13: Secure the stitches, remove the hand tacking, trim the loose threads and press the collar pattern neatly.

4. Plackets - Procedure

Continuous Bound Placket

Step 1: Take a sample fabric of 10x10 cm

Step 2: Cut a slash about 5 cm in the center of the sample piece.

Step 3: The cut fabric should be 3 to 6cm wide and 3cm longer than twice the length of the openings.

Step 4: Match the center of a long edge of the strip to the end of the slash edge, with right sides of sample fabric and strips facing each other.

Step 5: Pull back the tip of the slash about 0.25 cm from the edge of the placket strip and pin it.

Step 6: Open the placket edges wide and attach to the strip by a line of tacking, 0.25 cm from the edge of the strip.

Step 7: From the right side of the sample fabric, machine over the tacking line from one end upto its midpoint.

Step 8: Keep the machine needle in the fabric, raise the pressure foot and move the fullness backward out to prevent fold created on the placket.

Step 9: Lower the presser foot and stitch along the opposite end of the opening.

Step 10: Take care to make narrow down the stitches towards midpoint and also from mid-point to cut edge.

Step 11: Press the seam edges towards the placket strip and fold under the free edge of the strip of 0.25 cm to the wrong side and crease.

Step 12: Fold the strip over the seam edge and hem it along the stitching line.

Step 13: Fold the strip under the overlap section and tack it close to the seam.

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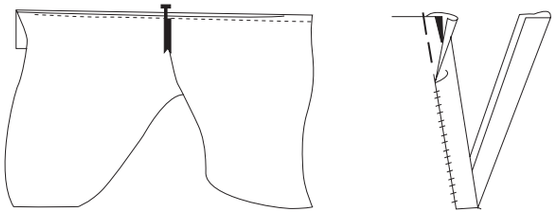
Step 14: Press the sample neatly.

Note: Tacking should be removed after fixing the fasteners.



Continuous Bound Placket

Two Piece Placket

Step 1: Take a sample fabric of 10x10 cm

Step 2: Cut two separate strips of fabric, measuring 8 cm width for the overlap and the other with 6 cm width for the under lap.

Step 3: The length of the strips should be 2.5 cm more than the length of the placket opening.

Step 4: The overlap and under lap sides are finished with the narrow and wide strips respectively.

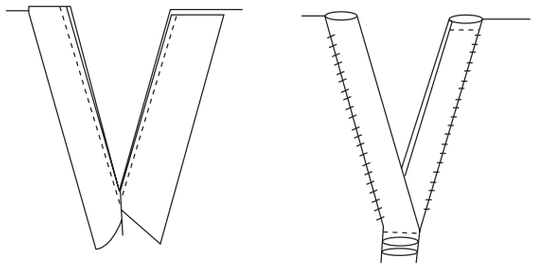
Step 5: Place 8 cm width strip on the fabric right side facing and make a row of stitch leaving 0.25 cm and take it to the wrong side completely (Underlap). Fold the strip 0.25 and hem or machine to finish underlap.

Step 6: Care should be taken to maintain the stitching line of the seam along with the strips stitching line.

Step 7: 2.5 cm extra length of the strips should extend below the placket opening.

Step 8: Place 6 cm width strip on fabric right side facing to the sample fabric and do a row of machine stitch and take it to the wrong side completely (Overlap). Fold the strip 0.25 cm and make a row of machine stitch and finish overlap

Step 9: Press the sample neatly.



Two Piece Placket

5. Pockets – Procedure

Patch Pocket

Step 1: Take 10x10 cm fabric sample and mark the pocket position.

Step 2: To make pocket cut 5x5 cm printed fabric

Step 3: Mark 2.5 cm hem allowance for the top edge and 1.25 cm seam allowance for other three edges.

Step 4: Machine stitch or hem the top edge of pocket piece.

Step 5: Keep the pocket piece on the marked position of the base fabric.

Step 6: Secure with bell pins and stitch around three sides and press the sample.

Note: The lower edges of the pocket can be shaped as per ones preference, type of garment and material used.

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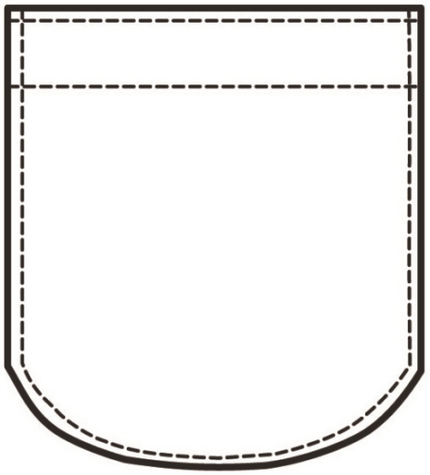


Patch Pocket

Inseam Pocket

Step 1: Take two pairs of pocket pieces in the main fabric or plain fabric.

Step 2: Finish all the edges of pocket pieces.

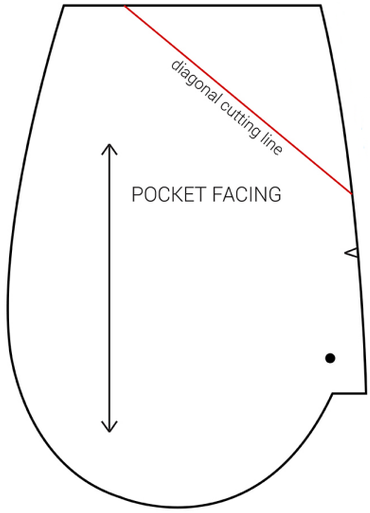
Step 3: Stitch pocket pieces to front and back opening, right sides together. Press seam allowances toward pocket pieces.

Step 4: Pin the front and back patterns matching at seam line and pocket.

Step 5: Stitch diagonally along seam and around pocket in one step. Use reinforcement stitches. Press seam allowance flat.

Step 6: Turn the pocket towards the front side.

Note: Piping material would be effective. Buttons may be fixed in groups to create design interest.



Inseam Pocket

6. Yokes – Procedure

Yoke without Fullness

Step 1: Select printed fabric for yoke part and plain fabric for the bodice.

Step 2: Trace front basic bodice pattern and draw the yoke line measuring from shoulder to the center front diagonally.

Step 3: Cut along the line and remove the yoke pattern separately.

Step 4: Trace that pattern on the printed fabric with seam allowance.

Step 5: Join yoke part to the bodice part with plain seam and top stitch.

Step 6: Secure the stitches, trim the loose threads and press the yoke pattern neatly.

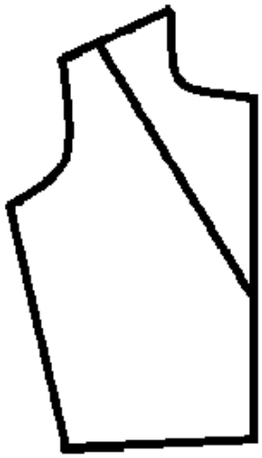
XI_EM_TDD_PRACTICALS_2022.indd 209 24-01-2023 14:09:40

Yoke with Fullness

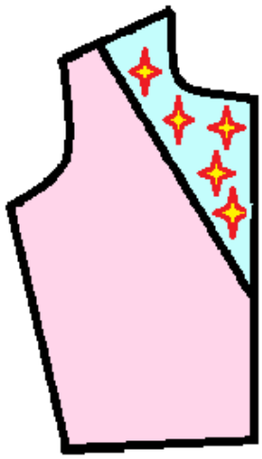
Step 1: For yoke with fullness take twice the measurement of yoke pattern with seam allowance.

Step 2: Introduce pin tucks in the fabric and bring the yoke to the exact measurement.

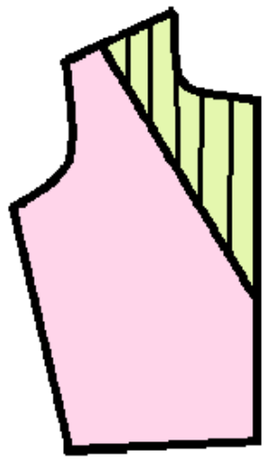
Step 3: Follow the steps for yoke without fullness and complete the sample.



Basic Yoke



Yoke without Fullness



Yoke with Fullness

Conclusion

- Gained knowledge in selection of fabrics for making garment components
- Developed skills in constructing Necklines, Sleeves, Collars, Plackets, Pockets and Yokes.

Video Suggestions:

S. No	Title/purpose	Link
1	Necklines	https://www.youtube.com/watch?v=ZpiA87ynraI
2	Sleeves	https://www.youtube.com/watch?v=1ObWd6EICe0
3	Collars	https://www.youtube.com/watch?v=bTTFsWYTIlk
4	Plackets	https://www.youtube.com/watch?v=XGbFtwRgEyg
5	Pockets	https://www.youtube.com/watch?v=19do41o3BEA https://www.youtube.com/watch?v=404i7jFsJ_8
6	Yokes	https://www.youtube.com/watch?v=tNCTgE2OPt4

Simple Assessments:

Student project at home	Prepare a sample for each topic discussed above
Guest lecture suggestions	-
Industrial/ Field visit suggestions	Visit to the nearest sewing industry

XI_EM_TDD_PRACTICALS_2022.indd 210 24-01-2023 14:09:40

PRACTICAL

6

PATTERN MAKING - PREPARATION OF BASIC PATTERN SET

Objectives:

- To gain knowledge in pattern making.
- To acquire skills in preparing basic patterns and drafting procedure.

Operation Sequence to be Followed

Measurements- Key measurements required for preparing Basic Pattern Set

Demonstration- Draft the Basic Pattern Set (Basic Bodice, Skirt and Sleeve)

Tools and Equipment Required

Activity Title	S. No	Name of the apparatus/ components	Range/Value	Quantity
Measuring tools	1	Measuring tape, Ruler, Note pad	-	One of each
Drafting tools	2	Brown paper, Dress form, Bell pins, Pin cushion	-	One of each
Marking tools	3	Colour pencil(Red and Blue), Marking chalk, Tracing wheel, Tailor's square, French curves, Hip curve.	-	One of each

Instructions for Basic Block Preparation:

- Name of the Block: Example -Skirt front, Bodice back.
- Grain line: It is a line drawn from end to end on each pattern piece. It indicates how the pattern should be aligned with the lengthwise grain of the fabric.

Straight grain	**Cross grain**	**Bias grain**

XI_EM_TDD_PRACTICALS_2022.indd 211 24-01-2023 14:09:40

- **Size:** Example: 32, 34, 36 or S, M, L

Key Measurements for Basic Pattern Set

Before preparing any basic pattern, we need some key measurements to follow. Accurate measurements results in proper fit of the garments.

Measurements required to prepare patterns for basic blocks

Basic Bodice (Front/Back)	Basic Skirt (Front/Back)	Basic Sleeve
1. Centre back length	1. Skirt length	1. Full sleeve length
2. Centre front length	2. Hip round	2. Armhole round
3. Bust/Chest circumference	3. Waist round	3. Sleeve opening
4. Across shoulder	4. Hip length	4. Upper arm round
5. Waist round	5. Waist band height	5. Elbow round
6. Neck circumference	6. Seat height	6. Wrist round
7. Neck depth		7. Elbow to wrist
8. Across back		
9. Across chest front		
10. Bust height		
11. Bust point to bust point		

STUDENT ACTIVITY 1: The student should note the measurements required for the basic bodice of his/her friend in the given chart. The standard measurements (from dress form) are given below for reference;

Standard Measurement

S. No	Point of Measure	Measurement (in cm)
1	Centre Back Length	42
2	Chest circumference	92
3	Across shoulder	38
4	Across front	34
5	Across back	36
6	Waist round	65
7	Bust height	25
8	Bust point to bust point	18.5
9	Neck circumference	37

Student Measurement

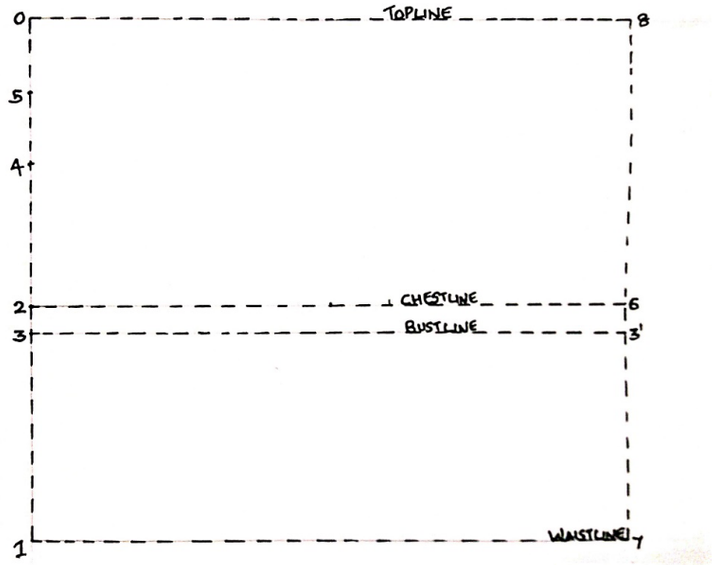
S. No	Point of Measure	Measurement (in cm)
1	Centre Back Length	
2	Chest circumference	
3	Across shoulder	
4	Across front	
5	Across back	
6	Waist round	
7	Bust height	
8	Bust point to bust point	
9	Neck circumference	

XI_EM_TDD_PRACTICALS_2022.indd 212 24-01-2023 14:09:40

Drafting Procedure: Basic Bodice

Basic Lines: Length and Width

Marking no	Description	Point of Measure	Measurements
0	Start		
0-1	Centre back length	CB Neck point to waist	42 cm
0-2	Armhole depth	¼ bust round	¼ x92=23 cm
0-3	Bust height	High Point Shoulder (HPS) to Bust Point (BP)	25 cm
0-4	Across back	Mid of 0-2	
0-5	-	Mid of 0-4	
2-6	Chest line	½ bust round + 2 cm (ease)	(½ x 92) + 2=48 cm
3-3'	Bust line	Same as 2-6	48 cm
1-7	Waist line	Same as 2-8	48 cm
0-8	Top line	Same as 2-6	48cm
7-8	Centre Front Length	Same as 0-1	42 cm

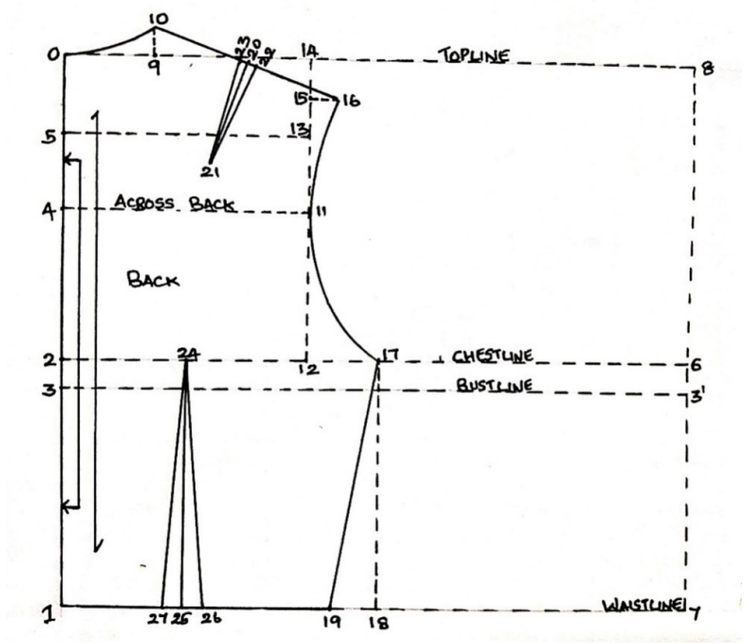


Back Bodice:

Marking no	Description	Point of Measure	Measurement
0-9	Neck width	1/5 neck round minus 0.5 cm	(1/5 x37) – 0.5=6.9 cm
9-10	Back neck depth		2 cm
0-10	Back neckline	Shape 0-10 using French curve	
4-11	Across back line	½ across back + 0.5 cm	(½ x 36) + 0.5=18.5
Square down to 12 and square up to 13 & 14			
13-15			3 cm up

XI_EM_TDD_PRACTICALS_2022.indd 213 24-01-2023 14:09:40

Marking no	Description	Point of Measure	Measurement
15-16			2 cm across from 15
10-16	Shoulder line	Join 10-16	
2-17	Back chest line	Mid of 2-6	
1-18	Back waist line	Same as 2-6	
1-19	Back waist	¼ waist round + 3 cm (dart) + 1 cm (ease)	(¼ x 65) +3+1=20.25 cm
17-19	Back side seam	Join 17-19	
20	Shoulder dart position	Mid of 10-16	
20-21	Dart length		8 cm
20-22 & 20-23	Dart width		0.5 cm
24	Waist dart point	Mid 2-12	
25	Waist dart position	Square down from 24-25	
25-26 & 25-27	Dart width		1.5 cm each

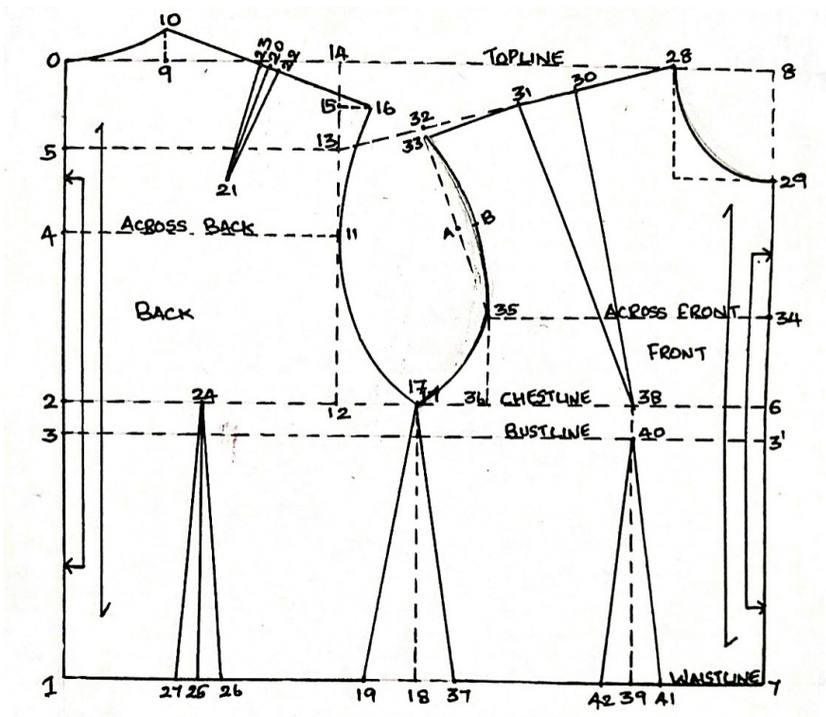


Front Bodice:

Marking no	Description	Point of Measure	Measurement
8-28	Neck width	1/5 neck round - 0.5 cm	(1/5 x 37)-0.5=6.9 cm
8-29	Front neck drop	1/5 neck round	(1/5 x 37=7.4 cm
28-29	Front neckline	Shape 28-29 using French curve	
28-13	Shoulder line	Join	
28-30		Same as 10-23	

XI_EM_TDD_PRACTICALS_2022.indd 214 24-01-2023 14:09:40

Marking no	Description	Point of Measure	Measurement
30-31	Shoulder dart width		4 cm
31-32		Same as 22-16	
32-33	Shoulder tip	Square down	0.5 cm
6-34	Across chest position		1/3 (6-29) + 1 cm= 6.1 cm
34-35	Across front line	½ across front + 2 cm (half front dart width) + 0.25 cm (ease)	(½ x 34) +2+0.25= 19.25 cm
Join 35-33			
Square down from 35-36			
A is mid of 33-35			
A-B	Armhole shape guide		1 cm
33-B-35-17	Front armhole	Shape 33-B-35-17 using French curve	
7-37	Front waist	¼ waist round + 4 cm (dart) + 1 cm (ease)	(¼ x 65) + 4+1= 21.25 cm
17-37	Side seam	Join 17-37	
6-38	Front dart point	½ bust span	½ x 18.5=9.25
Join 30-38 and 31-38 to complete the front shoulder dart			
39	Waist dart position	Square down from 38	
40	Waist dart point	Position at bustline	
39-41 & 39-42	Dart width	2cm each	



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STUDENT ACTIVITY-2:

Draw the quarter size pattern of the Basic bodice block (front & back) in the graph paper provided in the next page with measurements of your friend that is recorded in Activity-1

STUDENT ACTIVITY 3:

The student should note the measurements required for the basic skirt of his/her friend in the given chart. The standard measurements (from dress form) are given below;

Standard Measurement

S. No	Point of Measure	Measurement (in cm)
1	Skirt length	60
2	Hip round	94
3	Waist round	68
4	Hip length	20
5	Waist band height	4

Student Measurement

S. No	Point of Measure	Measurement (in cm)
1	Skirt length	
2	Hip round	
3	Waist round	
4	Hip length	
5	Waist band height	

Note:

- All preparatory steps should be followed by the students before taking the measurements.

DRAFTING METHOD: Basic Skirt

Basic Lines: Length and Width

Marking no	Description	Point of Measure	Measurement
0	Start		
0-1	Length	Skirt length – waistband height	60-4=56 cm
0-2	Waist line	½ hip round + 5 cm (ease)	(½ x 94) + 5=52 cm
1-3	Hem line	Same as 0-2	52 cm
0-4	Hip length (waist to hip)	Hip length – waist band height	20-4= 16 cm
4-5	Hip line	Same as 0-2	52 cm
0-6	Partition line for front and back	½ (0-2) + 1 cm	(½ x 52) + 1= 27 cm
Square down from 6-7-8			

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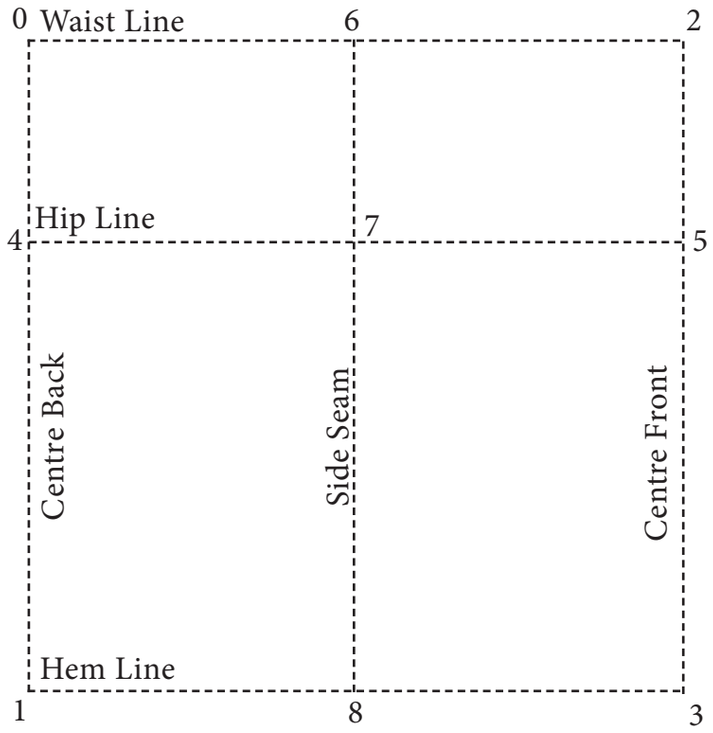

Back Skirt:

Marking no	Description	Point of Measure	Measurement
0-9	Back waist arc	¼ waist round + 1 cm (ease) + 6 cm (dart)	(¼ x 68) +1+6= 24 cm
9-10		Square up	2cm
0-11		Mark point	1 cm
10-11	Back waist line	Shape 10-11 using a hip curve	
11-12	First dart placement		8 cm
12-13	Dart intake		3 cm
A is mid of 12-13			
A-A^1	Dart length		14 cm
Join 12-$A^1$and 13-A^1			
13-14	Second dart placement		4 cm
14-15	Dart intake		3 cm
B is mid of 14-15			
B-B^1	Dart length		14 cm
Join 14-B'and 15-B^1			
10-7-8	Side seam	Shape 10-7 using hip curve	

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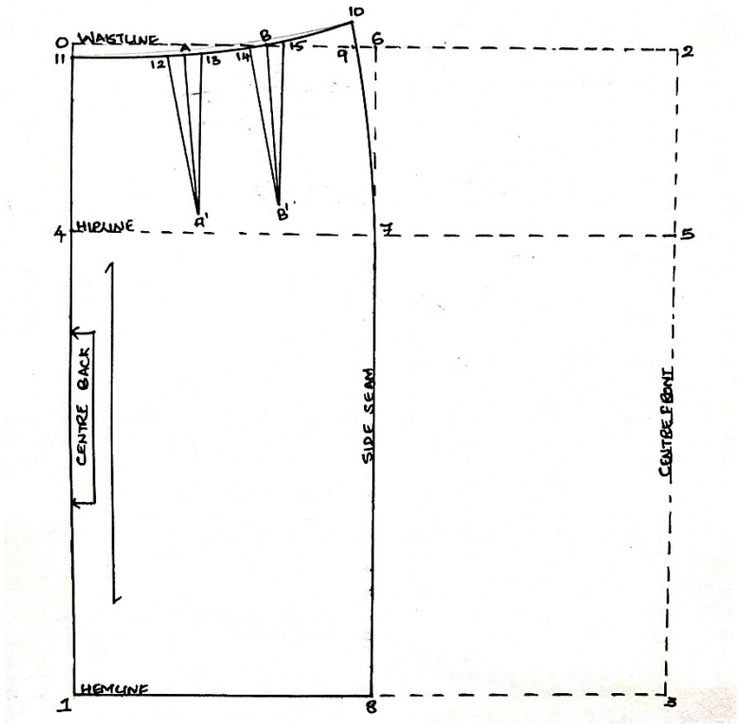
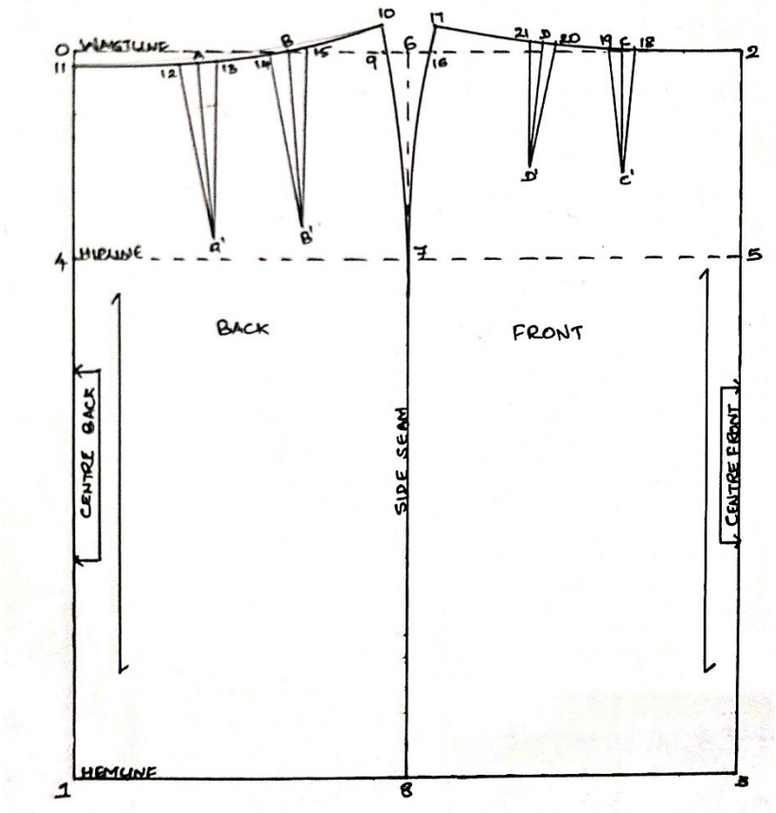


Front Skirt:

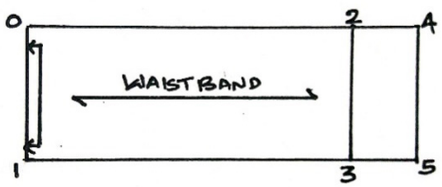
Marking no	Description	Point of Measure	Measurement
2-16	Front waist arc	¼ waist round + 1 cm (ease) + 4 cm (dart)	(¼ x 68) +1+4= 22 cm
16-17		Square up	2cm
2-17	Front waist line	Shape 2-17 using a hip curve	
2-18	First dart placement		8.5 cm
18-19	Dart intake		2 cm
C is mid of 18-19			
C-C^1	Dart length		10 cm
Join 18-C'and 19-C^1			
19-20	Second dart placement		4 cm
20-21	Dart intake		2 cm
D is mid of 20-21			
D-D^1	Dart length		10 cm
Join 20-D^1 and 21-D^1			
17-7-8	Side seam	Shape 17-7 using hip curve	

XI_EM_TDD_PRACTICALS_2022.indd 218 24-01-2023 14:09:41



Waist band:

Marking no	Description	Point of Measure	Measurement
0	Start point		
0-1	Waist band height	2 x waistband height	2x8=16 cm
0-2 &1-3	Waist band length	½ waist round (after closing darts)	37 cm
2-3	Waist band height	Same as 0-1	16 cm
2-4 & 3-5	Button extension	Standard measurement	5 cm
Join 4-5			



STUDENT ACTIVITY-4:

Draw the quarter size pattern of the Basic Skirt Block (front & back) in the graph paper with measurements of your friend that is recorded in Activity-1

Note: The teacher should provide one-fourth scale for drafting in quarter size

XI_EM_TDD_PRACTICALS_2022.indd 219 24-01-2023 14:09:41

STUDENT ACTIVITY 5:

The student should note the measurements required for the sleeve of his/her friend in the given chart. The standard measurements (from dress form) are given below;

Standard Measurement

S. No	Point of Measure	Measurement (in cm)
1	Sleeve length	58
2	Armhole round	42
3	Sleeve cap	22

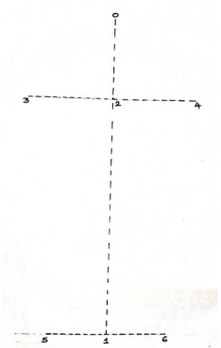
Student Measurement

S. No	Point of Measure	Measurement (in cm)
1	Sleeve length	
2	Armhole round	
3	Sleeve cap	

DRAFTING METHOD

Basic lines: Length and width

Marking no	Description	Point of Measure	Measurement
0	Start		
0-1	Sleeve length (Center line)		58 cm
0-2	Cap height (crown height)	1/4 armhole round	¼ x 42= 10.5 cm
2-3 & 2-4	Bicep line	Square out from 2	
1-5 & 1-6	Hemline	Square out from 1	



Sleeve: Back Part

Marking no	Description	Point of Measure	Measurement
0-3	Sleeve cap guide line	½ armhole round – 0.5 cm	(½ x 42)-0.5= 23.5 cm
Divide 0-3 into four equal parts and mark 7, 8, 9 respectively			
7-10	Square up		2 cm
8-11	Square up		1 cm
9-12	Square down		0.5 cm
0-10-11-12-3	Back cap line	Shape using French curve	
1-5	Hem line	½ sleeve round	½ x 22=11 cm
3-5	Underarm seam	Join 3-5	

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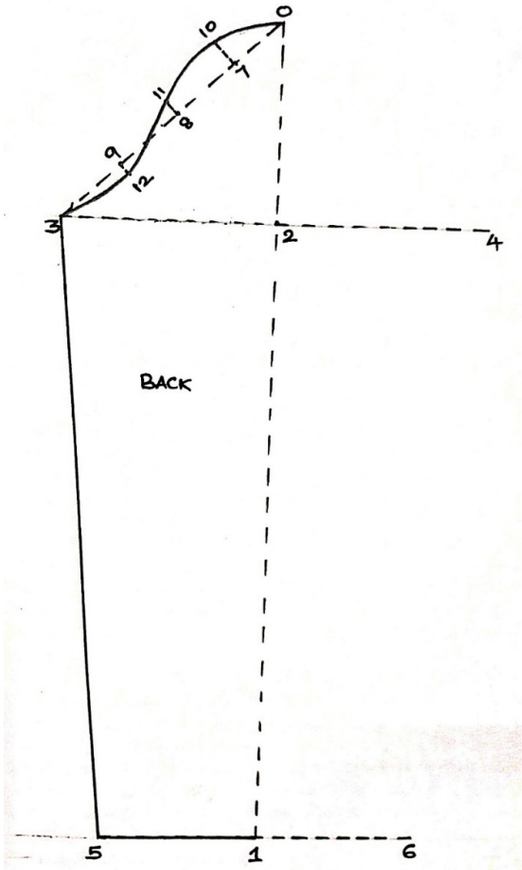
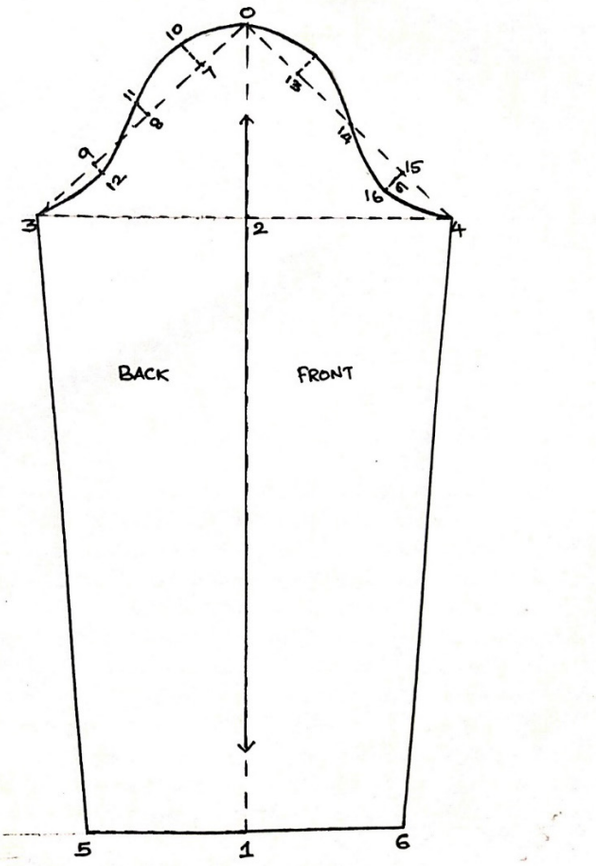




Sleeve: Front Part

Marking no	Description	Point of Measure	Measurement
2-4	Sleeve cap guide line	½ armhole round – 0.5 cm	(½ x 42)-0.5= 23.5 cm
Divide 2-4 into four equal parts and mark 13,14,15 respectively			
13-14	Square up		2 cm
15-16	Square down		2 cm
0-13-14-16-4	Front cap line	Shape using French curve	
1-6	Hem line	½ sleeve round	½ x 22=11 cm
4-6	Underarm seam	Join 4-6	

STUDENT ACTIVITY 6:

Draw the quarter size pattern of the sleeve in the graph paper provided in the next page with measurements of your friend that is recorded in Activity-5

Conclusion

- Understood the basic measurements required to prepare basic blocks and how to measure them
- Acquired skills in preparing basic blocks using the procedure.

XI_EM_TDD_PRACTICALS_2022.indd 221 24-01-2023 14:09:41

Video Suggestions:

S. No	Title/purpose	Link
1	How to take body measurement (Tamil)	https://www.youtube.com/watch?v=Ud9vYEolV_4&t=20s
2	How to take measurement using inch tape and scale (Tamil)	https://www.youtube.com/watch?v=AxkIYtSCjek
3	Drafting basic bodice patterns (English)	https://www.youtube.com/watch?v=fHRdwcLMgps&t=4s
4	Pattern Cutting - Flat Pattern Drafting, the Bodice Block part 1	https://www.youtube.com/watch?v=EdJSUd71CdI

Simple Assessments:

Student project at home	Identify the given measurements for their type and note them in the table given below. Across front, garment length, bust, chest, neck width, neck circumference, bust span, armhole depth, armhole round, hip length, across shoulder, sleeve engths, hem width, bust height
Guest lecture suggestions	-
Industrial/ Field visit suggestions	–

1. Identify the given measurements for their type and note them in the table given below.

Across front, garment length, bust, chest, neck width, neck circumference, bust span, armhole depth, armhole round, hip length, across shoulder, sleeve length, hem width, bust height

Sl. No	Length measurements	Width measurements	Circumference measurements

XI_EM_TDD_PRACTICALS_2022.indd 222 24-01-2023 14:09:41

PRACTICAL 7

PREPARATION OF SAMPLE FOR TYPES OF EMBELLISHMENTS

Objectives:

- To gain knowledge in the application of embellishments on garments and household products.
- To acquire skills in stitching patch work, quilting, applique, laces and scalloping

Operation sequence to be followed

Patch Work: Joining stripes, squares, triangle or other shaped pieces of fabric by hand or machine.

Applique: Attaching a contrasting material/designed fabric on a large back ground

Quilting: Geometrical designs like circle, diamond, and square shapes are stitched on layers of fabric.

Scalloping: Rhythmical edging in a fabric or garment.

Laces: Decorative fabric or yarn made by hand / machine or crocheting or tatting.

Tools and Equipment Required:

Activity Title	S. No	Name of the apparatus/ components	Range/ Value	Quantity
Patch work	1	Chart sheet, different types of fabrics,sewing machine, sewing kit	-	10x10 cm fabric (2 different colours)
Applique	2	Embellished fabric, ready made applique, sewing machine, sewing kit	-	10 x10 cm fabric and applique
Laces	3	Ornamental fabric made of thread (lace),sewing machine, sewing kit	-	10 x10 cm fabric Lace:1/2 meter
Quilting	4	Fabric, foam sheet, inter lining material, sewing machine, sewing kit	-	10 x10 cm fabric foam inter lining
Scalloping	5	Fancy fabrics, sewing machine, sewing kit	-	10 x10 cm fabric

XI_EM_TDD_PRACTICALS_2022.indd 223 24-01-2023 14:09:41

1. Patch Work

Procedure

Step 1: Draw a design for patch work on a paper.

Step 2: Prepare a template in a card board.

Step 3: Place the template on fabric, add seam allowances and cut.

Step 4: Attach fabric pieces as per the design either by hand or by machine

Step 5: Secure threads at the start and end of the patch work.

Note: Commonly used shapes are Triangles, Diamonds, and Hexagon

Example: Hexagon shapes should be drawn on paper, cut on card board. This should be traced on fabrics with seam allowances and cut. The fabrics should be attached using hand or machine stitch and made into a single piece of fabrics.

Patch Work

2. Applique

Procedure:

Step 1: Choose an applique piece.

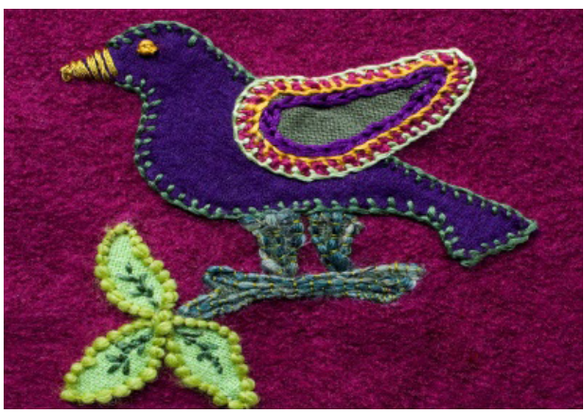
Step 2: Take a base fabric and iron neatly

Step 3: Place the applique on the base fabric.

Step 4: Attach applique piece to the base fabric with hand stitch temporarily.

Step 5: Use straight, satin, back or button hole stitch to attach the applique to the base fabric firmly.

Note: Machine stitches can also be used to attach applique.



Applique

3. Laces

Procedure

Step 1: Take 10 x10 cm base fabric.

Step 2: Choose a net like ornamental fabric (lace) made of threads.

Step 3: Lace can be attached to the fabric at the bottom or all around fabric.

Step 4: Fold the hem line and stitch. Attach the lace at the top of hem line.

Step 5: Press the fabric attached with lace neatly.

Note: Small size laces can be kept at neck lines. In children's garment large size lace can be kept as yokes/collars for decoration.

XI_EM_TDD_PRACTICALS_2022.indd 224 24-01-2023 14:09:41

Laces

4. Quilting

Procedure

Step 1: Mark lines on the front fabric to create design.

Step 2: Cut fabric, foam and interlining material to the required measurement.

Step 3: Sandwich the foam in between the front fabric and interlining material.

Step 4: Secure all three layers of the fabrics with bell pins,hand tack and join.

Step 5: Stitch on marked lines with hand or machine to get quilted effect.

Quilting

5. Scalloping

Procedure

Step 1: Prepare a template of semi-circle pattern in a chart paper.

Step 2: Place the template on the fabric and mark semi-circle pattern.

Step 3: Cut along the marked semi-circle pattern lines using a sharp shears to ensure the curved edges.

Step 4: Finish the raw edges with satin, buttonhole or overcasting stitch.

Note: Embroidery machine can be used to finish the raw edges.

Scalloping

CONCLUSION

- Understood designing and constructing patch work, applique, quilting and attaching lace
- Gained skills in choosing fabric and supporting materials depending upon the work.

XI_EM_TDD_PRACTICALS_2022.indd 225 24-01-2023 14:09:42

Video Suggestions :

S. No	Title/purpose	Link
1	Patch work-pillow cover, cushion cover, wall hanger	https://www.seasonedhomemaker.com/how-to-make-an-easy-patchwork-quilt/
2	Applique-frock, saree, pillow cover, wall hangers	https://www.youtube.com/watch?v=MJXOdumXP9g
3	Laces-table mat , kerchiefs	https://www.google.com/search?q=how+to+stitch+lace+on+saree&bih=531&biw=1034&hl=en&sxsrf=APq-
4	Quilting-cushion cover, blanket	https://www.marthastewart.com/1529650/techniques-for-hand-quilting
5	Scalloping-frock, skirts, table cloth	https://www.youtube.com/watch?v=EM2DH6ilS6s

Simple Assessments:

Student project at home	Prepare a sample for each topic discussed above
Guest lecture suggestions	-
Industrial/ Field visit suggestions	–

XI_EM_TDD_PRACTICALS_2022.indd 226 24-01-2023 14:09:42

PRACTICAL

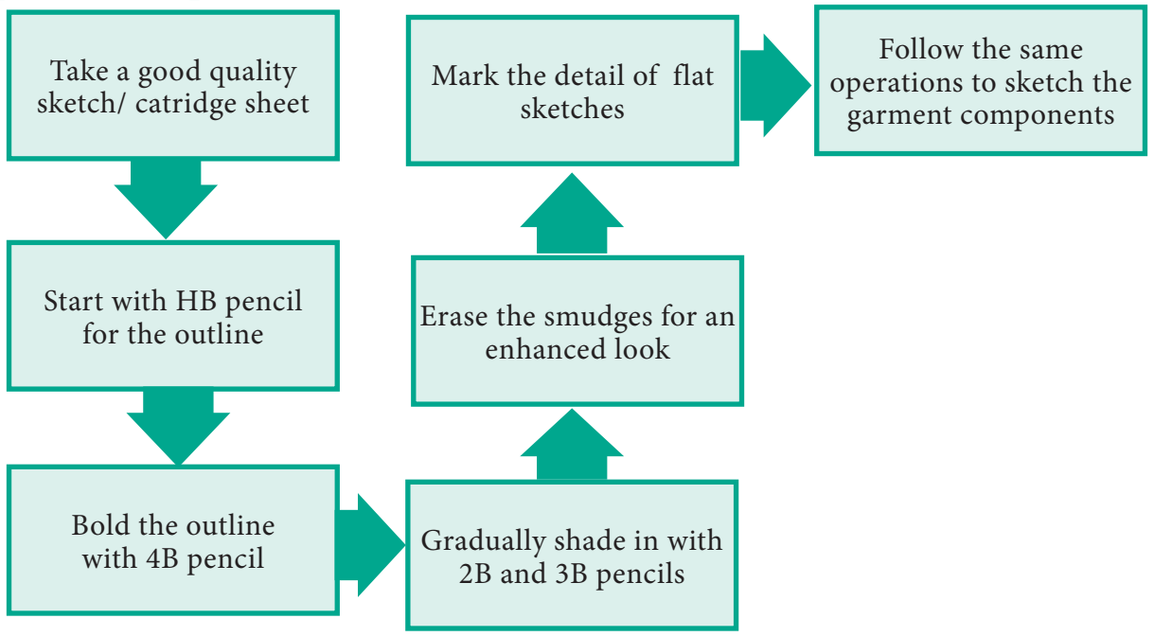
8

DEVELOPMENT OF FLAT SKETCHES FOR GARMENT COMPONENTS

Objectives:

- To gain knowledge on flat sketches
- To get a clear idea about flat sketching of garment components and its detail.

Operations sequence to be followed



Tools and Equipment Required

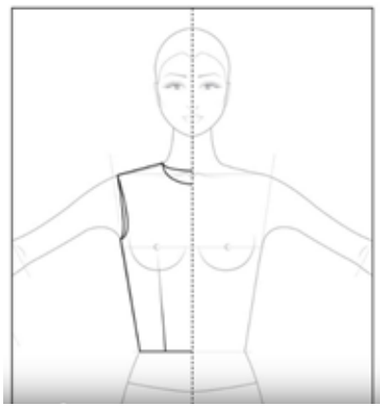
Activity Title	S. No	Name of the apparatus/ components	Range/ Value	Quantity
Preparing flat sketches for various garment components	1	Pencils- HB, 2B, 3B and 4B	–	1
	2	Pencil sharpeners and erasers	–	1
	3	Fine black pens	–	1
	4	Sketch Paper/ Cartridge	–	1

XI_EM_TDD_PRACTICALS_2022.indd 227 24-01-2023 14:09:42

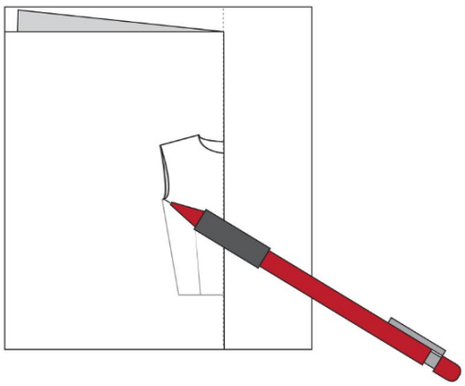
Flat Sketching

Procedure

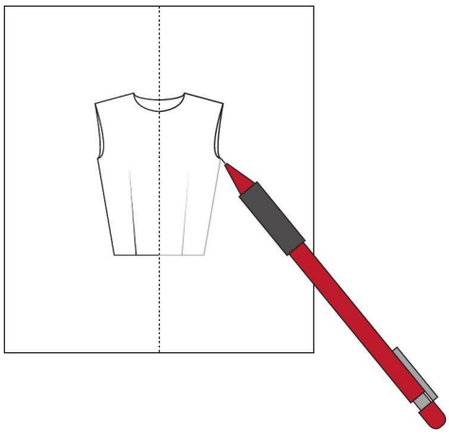
Step 1: Draw a straight line on the centre of a paper. Consider the line as the centre front of the garment. Place the croquis behind the paper. Trace it neatly.



Step 2: Fold the paper and trace the other half of the croquis for back pattern of the garment. Draw the outline of the selected garment.



Step 3: Open the paper and retrace to complete the drawing. Draw the front and back of the garment.

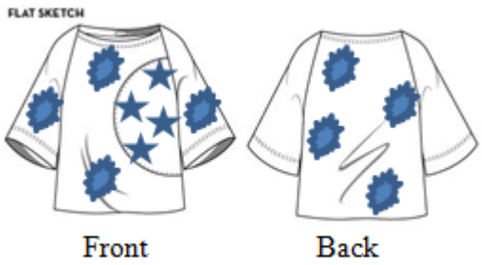


Step 4: Erase any pencil marks and retrace (if required). Separate the front and back from the drawings when required.

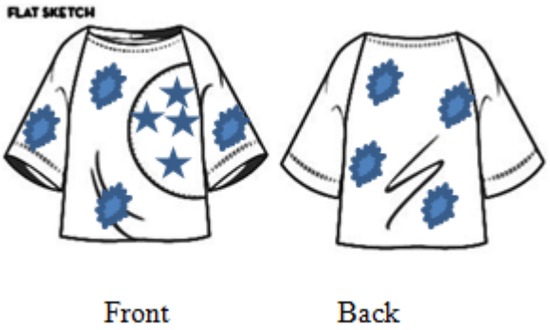
Step 5: Check and sketch front and back of the selected garment (If required).

XI_EM_TDD_PRACTICALS_2022.indd 228 24-01-2023 14:09:42

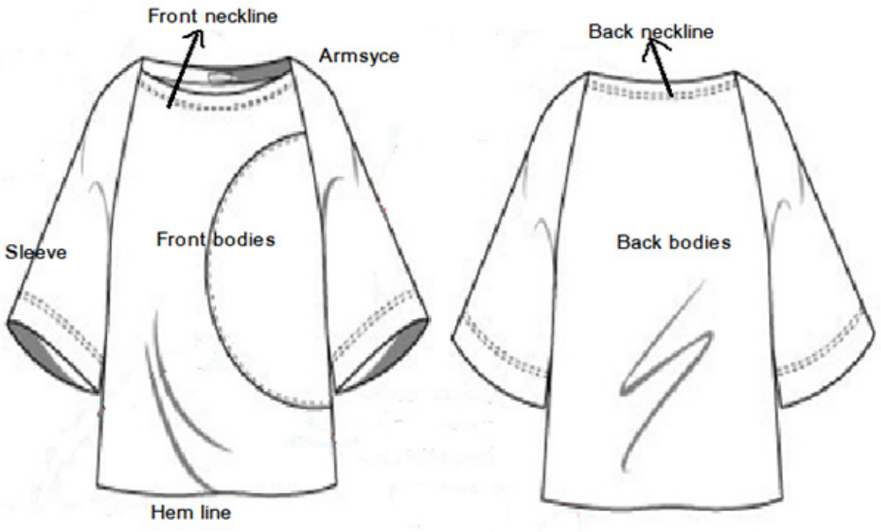
Step 6: Add design details like Pleats, Frills, Buttons, Collars, Embroidery.



Step 7: Use solid lines for outlines.



Step 8: Mark the detail of flat sketches.



Conclusion:

- Flat sketches gave an idea about the shape and other specific details of the garment components
- Achieved skills in sketching technical components that is needed to make garments.

Video Suggestions:

S. No	Title/purpose	Link
1	How to Draw Technical Flats by Hand (no software required)	https://www.youtube.com/watch?v=QTuPOPTbxDk
2	How to draw flats, its tools	https://www.youtube.com/watch?v=tqY3YRP-aUQ

Simple Assessments:

Student project at home	Draw a flat sketch of a womens casual wear
Guest lecture suggestions	Invite Staffs from fashion institutes/colleges for guest lecture and training
Industrial/ Field visit suggestions	–

XI_EM_TDD_PRACTICALS_2022.indd 229 24-01-2023 14:09:42

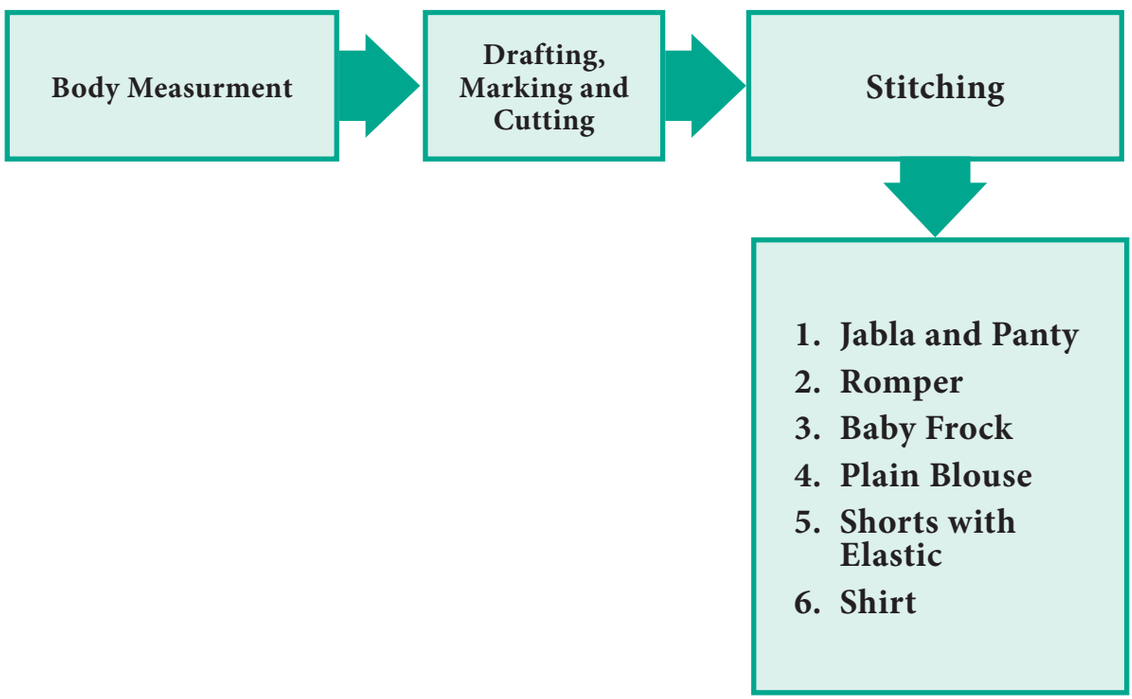
PRACTICAL

9 GARMENT CONSTRUCTION

Objectives:

- To understand the basic measurements required for preparing patterns
- To prepare pattern for the garments
- To acquire skills in stitching of various garments

Operation Sequence to be Followed:



XI_EM_TDD_PRACTICALS_2022.indd 230 24-01-2023 14:09:42

Tools and Equipment Required

Activity Title	S. No	Name of the apparatus/ components	Range/Value	Quantity
Body Measurements	1	Measuring tape	Standard	1
Drafting, Marking and cutting procedure	2	Pattern sheet	Brown sheet	4
		French curve	Full size	1
		Armhole curve	Full size	1
		Ruler (60cm)	Wooden	1
		L-scale	Wooden	1
		Cutting table	Standard	1
		Sewing kit		1 unit
		Fabric required	Standard	
		Jabla and Panty	Mild coloured/ dainty printed cotton/ Cambric voile/ Glasco mul cotton.	0.70 cm
		Romper	Long cloth/ Poplin, Cotton/ Satin – Plain or Striped.	0.80 cm
		Baby Frock	Cotton/ Satin/ Silk/Denim/ Blended fabrics/ Contrast plain colour or Printed fabrics for Yoke.	1.20 m 0.25 cm
		Plain blouse	Cotton/ Silk/ Artificial silk/ Polyester	0.70 cm
		Shorts with elastic	Denim/ Blended fabrics/ Terry cotton/ Any thick fabrics.	0.60 cm
		Shirt	Polyester/ Cotton/ Terry cotton/ Silk/ Casement/Blended fabrics	0.50 cm
Sewing procedure and finishing	3	Sewing machine	Industrial/ Domestic	1
		Sewing thread	Standard (Based on colour one roll for each garment)	6
		Thread cutter	Standard	1
		Seam ripper	Standard	1
		Elastic	Standard (Roll elastic for Panty and Flat elastic for Shorts)	0.70 cm each

XI_EM_TDD_PRACTICALS_2022.indd 231 24-01-2023 14:09:42

1 JABLA WITH PANTY

Introduction

Jabla is a loose fitted garment used for new born babies and infants. They are usually stitched using pure cotton fabrics because it is worn by infants. It is usually worn along with a panty or knicker, which is basically an undergarment.

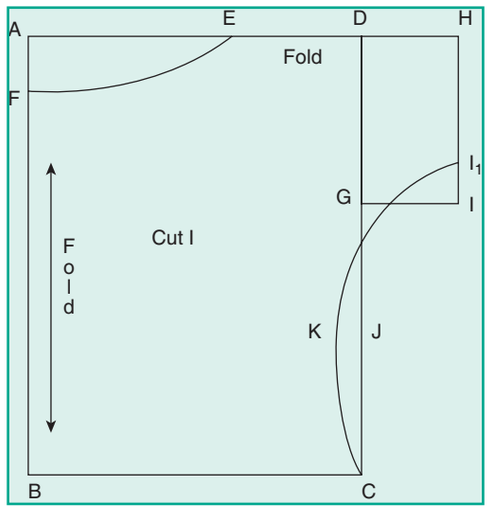
Age group - 0-6 months

Particulars	Measurements	Jabla	Panty
Chest measurement	40 cm		
Bodice length	25 cm		
Hip measurement	45 cm		
Panty length	15 cm		

Drafting Method

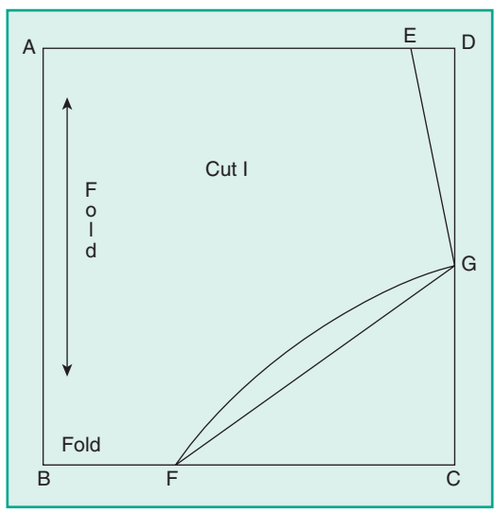
JABLA

S.No	Particulars	Drafting
1	AB	Length + 3 cm
2	BC	¼ Chest + 6 cm
3	AE	¼ Chest
4	AF	4 cm
5	DH=GI	6 cm
6	DG	10 cm
7	J	½ GC
8	JK	1.5 cm
9	I-I_1	2 cm



PANTY

S.No.	Particulars	Drafting
1	AB =CD	Length + 5 cm
2	AD =CB	1/3 Hip
3	DE	Hip / 24
4	BF	Hip /12 + 3 cm
5	DG	½ DC



XI_EM_TDD_PRACTICALS_2022.indd 232 24-01-2023 14:09:42

Cutting Lines

Jabla : Front and back	FEHI$_1$KCB
Panty: Front and back	AEGF

Components and Cut Number

Jabla - 1 (Front & Back)
Shaped facing - 1 (Front & Back)
Panty - 1 (Front & Back)

Marking and Cutting

- Place the paper pattern over the fabric and mark using marking chalk.
- Complete the pattern by marking notches and the pattern information should be written on the pattern using blue colour pencil for back patterns and red for front patterns. Care should be taken to draw dotted lines to indicate cutting lines and bold lines for sewing.
- Cut the fabric through the marked line using shears

Sewing Procedure – Jabla

Step 1: Attach facing of 3cm width (shaped facing) to the neckline

Step 2: Machine leaving 1 cm from neckline.

Step 3: Turn the facing to the wrong side fold the raw edges and finish the facing with hand hemming.

Step 4: Fold 1 cm seam and 2 cm hem allowance and finish the side seams and hem line.

Step 5: Join the sides with a plain seam and overlock the raw edges.

Step 6: Fold the raw edges and finish the hem line.

Sewing Procedure – Panty

Step 1: Finish leg curve by attaching a facing of 2 cm width. Turn the facing to the wrong side, fold the raw edges and finish.

Note: Use 1cm width elastic at leg opening (optional)

Step 2: Join the side seam with flat fell seam

Step 3: Fold the raw edges and waist line allowance (3 cms) at waistline to form a casing, machine and finish the waist line.

Step 4: Insert a tape or elastic into the casing at the waist line.

Conclusion:

- Understood the basic measurements required for pattern drafting of jabla and panty and how to take these measurements.
- Acquired skills in sewing jabla and panty.

Simple Assessments:

Write 5 different methods that can be used to enhance the jabla and panty stitching (Example: Use of decorative stitches around the jabla neckline and panty leg opening).

XI_EM_TDD_PRACTICALS_2022.indd 233 24-01-2023 14:09:42

Video Suggestions:

S.No	Title/purpose	Link
1.	Drafting of Jabla	https://youtu.be/VXVUNs8S298
2.	Drafting of Panty (Tamil)	https://youtu.be/ztSkpsUgdpQ

Cost Sheet

S No	Name of the Equipment's/ components required	Range/ Specifications	Quantity	Cost (approx.)	Value in the nearby store
1	Fabric	White Poplin	1 meter	40	
2	Thread	White	1 reel	10	
3	CMT (Cutting, Making, Trimmimg)	Standard		50	
			Wages and overhead : 25% of Material Cost		
			Total Cost to create/service on the product		
			Selling price in the market		
			Profit		

2 ROMPER

Introduction

A **romper** is a one-piece garment made by combining a shirt or blouse with a shorts or pant. This garment is normally used by infants and preschool kids. Appliqué, piping and binding can be used to decorate romper.

Age group - 1 Year

Particulars	Measurements	Romper
Length	35 cm	
Chest	55 cm	
Back waist length	20 cm	
Shoulder width	20 cm	
Hip	60 cm	

XI_EM_TDD_PRACTICALS_2022.indd 234 24-01-2023 14:09:42

Drafting Method

S. No	Description	Drafting
1	AB	Full length
2	AG	¼ chest
3	AC = GG_1	½ shoulder width
4	AH	Back waist length
5	GD = HE	¼ chest + 3 cm
6	BI	1/6 hip
7	IJ	1/3 hip
8	BB_1	1/12 chest
9	AA_1	5 cm
10	AA_2	8 cm
11	AA_3	5 cm
12	CC_1	1 cm

Cutting Lines

Front	A_2-A_3-C_1-D-E-J-B_1-B
Back	A_2-A_3-C_1-D-E-J-B_1-B

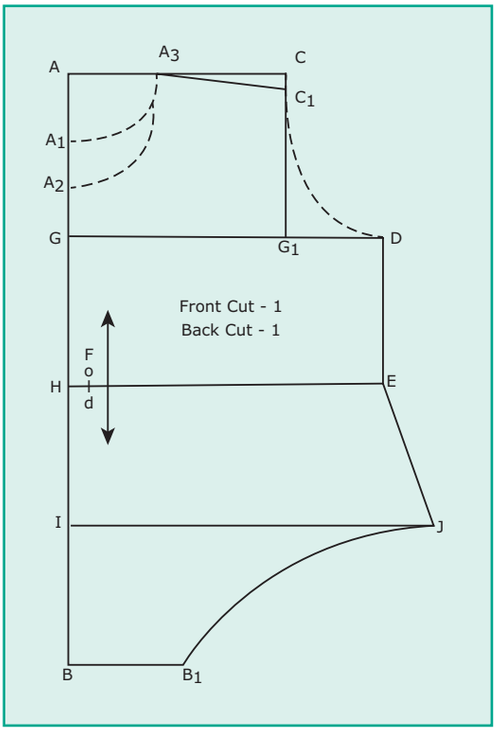
Components and Cut Number

Romper Front - 1

Romper Back - 1

Marking and Cutting

- Place the paper pattern over the fabric and mark using marking chalk.
- Complete the pattern by marking notches and the pattern information should be written on the pattern using blue colour pencil for back patterns and red for front patterns. Care should be taken to draw dotted lines to indicate cutting lines and bold lines for sewing.
- Cut the fabric through the marked line using shears



Sewing Procedure – Romper

Step 1: Sew a miter or continuous placket to the center front (Refer Chapter 11 page number 122 for placket sewing)

Step 2: Match the shoulder lines of the front and back patterns with right sides together.

Step 3: Make a plain seam with 1cm seam allowance

Step 4: Attach binding of 4 cm width to the neck part.

Step 5: Stitch with 1 cm seam allowance from neckline edge.

Step 6: Turn the binding to the wrong side fold the raw edges and machine neatly with even binding width.

Step 7: Finish with 3 cm binding piece. (Refer Chapter 11 for neckline sewing)

XI_EM_TDD_PRACTICALS_2022.indd 235 24-01-2023 14:09:43

Step 8: Join side seams with a plain seam and overlock the edges.

Step 9: Attach binding of 4 cm width to the leg curve edge and make a stitch leaving 0.5 cm.

Step 10: Turn binding, fold 0.5 cm and machine the edges neatly.

Note: Thin elastic can also be used in the leg curve

Step 11: Join the crotch with a plain seam and overlock the edges

Note: Piping can also be used in the neckline, armhole and leg curve

Step 12: Attach buttons and make buttonholes in the front placket

Conclusion

- Understood the basic measurements required for pattern drafting of Romper and how to take these measurements.
- Acquired skills in drafting and construction of a Romper.

Simple Assessments:

Sketch five different romper patterns for a preschool boy.

Video Suggestions:

S. No	Title/purpose	Link
1.	Sew a baby boy romper	https://youtu.be/Wi67krBo3Qo
2.	How to make a button placket	https://youtu.be/HckkzKvZ6g0

Cost Sheet

S. No	Name of the Equipment's/ components required	Range/ Specifications	Quantity	Cost (approx.)	Value in the nearby store
1.	Fabric	White Poplin	1 meter	40	
2.	Thread	White	1 reel	5	
3.	Elastic	white	0.25cm	10	
4.	Button	Plain white	5	5	
6.	CMT (Cutting, Making and Trimming)	Standard		50	
			Wages and overhead : 25% of Material Cost		
			Total Cost to create/service on the product		
			Selling price in the market		
			Profit		

XI_EM_TDD_PRACTICALS_2022.indd 236 24-01-2023 14:09:43

3 BABY FROCK

Introduction

Frock is a gown or dress which has the bodice and skirt patterns joined together. It is usually worn by girls and women. The length and width varies depending upon the design. It can be enhanced with laces, embroidery, appliques and other types of fullness.

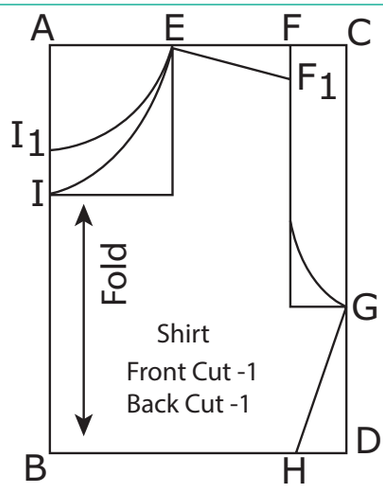
Age group: 3 Years

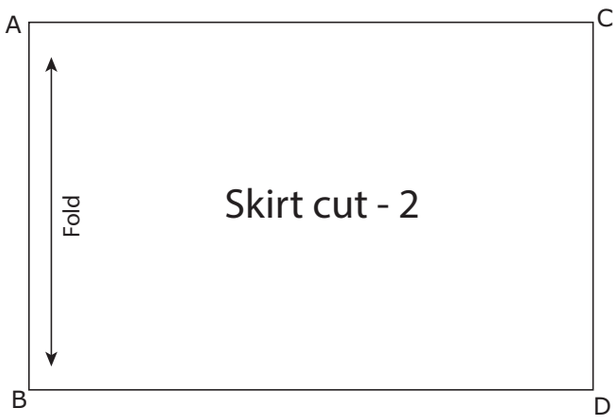
Particulars	Measurements	Baby Frock
Chest circumference	60 cm	
Shoulder width	24 cm	
Top length	20 cm	
Skirt length	35 cm	
Armhole	21 cm	
Sleeve length	11 cm	
Sleeve width	5 cm	
Neck width	4 cm	
Neck depth	Front 4/Back 3cm	
Waist circumference	56 cm	

Drafting Method

Bodice and Skirt Pattern

SI. No	Description	Drafting
1	AB=CD	Top length
2	AC=BD	¼ chest circumference
3	ABCD	Draw rectangle
4	A - E	Neck width
5	A - F	½ Shoulder
6	F - F_1	1 cm Shoulder slope
7	E - F_1	Joint line
8	F_1 - G	Arm hole
9	F - F_1 - G	Draw curve line as shown in figure
10	B - H	¼ waist circumference
11	G - H	Joint line
12	A - I_1	Back neck drop
13	A - I	Front neck drop
14	E - I_1 & E - I	Draw curve line as shown in figure
SKIRT PATTERN		
1	AB = CD	Skirt length
2	AC = BD	Skirt width ½ waist circumference x 3
3	ABCD	Draw rectangle

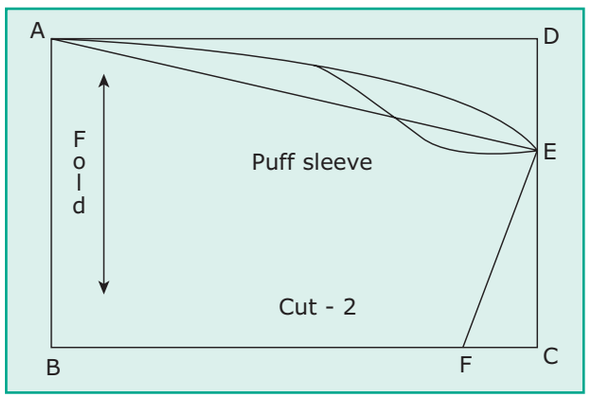




XI_EM_TDD_PRACTICALS_2022.indd 237 24-01-2023 14:09:43

Puff Sleeve

S. No.	Description	Drafting
1	AB = CD	Sleeve length + 2 cm
2	AD = BC	¼ chest + 7 cm
3	DE	5 cm
4	CF	1 cm



Cutting Lines

Front bodice	I-E-F_1-G-H-B
Back bodice	I_1-E-F_1-G-H-B
Skirt	ABCD
Sleeve	A – E – F – B

Frock Front Bodice - 1
Frock Back Bodice - 1
Skirt Front & Back - 1
Sleeve - 2

Marking and Cutting

- Place the paper pattern of the baby frock on the fabric and mark all the components using marking chalk.
- Complete the pattern by marking notches and the pattern information should be written on the pattern using blue colour pencil for back patterns and red for front patterns. Care should be taken to draw dotted lines to indicate cutting lines and bold lines for sewing.
- Cut the fabric through the marked line using shears

Sewing Procedure – Baby Frock

Step 1: Attach two-piece placket to the entire back bodice patterns.

Step 2: Binding with 1.5 cm width is attached to the left back bodice as overlap.

Step 3: Facing piece is attached to the right back bodice pattern as underlap

Step 4: Refer Chapter 11 for placket sewing

Note: For girls, the right panel should be over the left panel

Step 5: Place the shoulder lines together placing the right side of the fabrics together.

Step 6: Make a plain seam with 1cm

Step 7: Attach a binding piece of 4 cm width to the neck line.

Step 8: Machine along the neck line with 1 cm seam allowance

Step 9: Fold the raw edges and finish the neck line.

Step 10: Join side seams of the bodice front and back together with a plain seam and over lock the edges.

Step 11: Complete the sleeve hem line by folding the raw edges and folding again and stitching.

Step 12: Sew the sleeve side seams with plain seam.

Step13: Match the center of the sleeve with the shoulder line.

XI_EM_TDD_PRACTICALS_2022.indd 238 24-01-2023 14:09:43

Step14: Machine the sleeve cap with the armscye of the bodice block.

Step 15: Join the seams of skirt pattern and gather it at the waist line.

Step 16: Attach gathered waist line of skirt pattern with the bodice pattern.

Step 17: Hem the bottom of skirt with plain seam.

Step 18: Attach button and buttonhole on the placket

Conclusion:

- Understood the basic measurements required for pattern drafting of Baby frock and how to take these measurements.
- Acquired skills in taking body measurements for frock and constructing the same.

Video Suggestions:

S. No	Title/purpose	Link
1.	Baby frock cutting and stitching	https://youtu.be/5Q8lm_p-fCU
2.	Basic frock drafting, cutting and stitching	https://youtu.be/nb1Zuy0K01I

Simple Assessments:

Draw a Baby frock designs with a yoke.

Cost Sheet

S No	Name of the Equipment's/ components required	Range/ Specifications	Quantity	Cost (approx.)	Value in the nearby store
1.	Fabric	White Poplin	1 meter	40	
2.	Thread	White	1 reel	5	
3.	Tape	White	1 meter	20	
4.	Button	Plain white	5	5	
5.	CMT (Cutting, Making and Trimming)	Standard		50	
			Wages and overhead : 25% of Material Cost		
			Total Cost to create/service on the product		
			Selling price in the market		
			Profit		

XI_EM_TDD_PRACTICALS_2022.indd 239 24-01-2023 14:09:43

4 PLAIN BLOUSE

Introduction:

Plain Blouse is an upper garment used by girls and women. It is usually worn along with skirts or palazzos. Variations can be created in sleeves, necklines and hemlines through fullness.

Age Group: 3 years

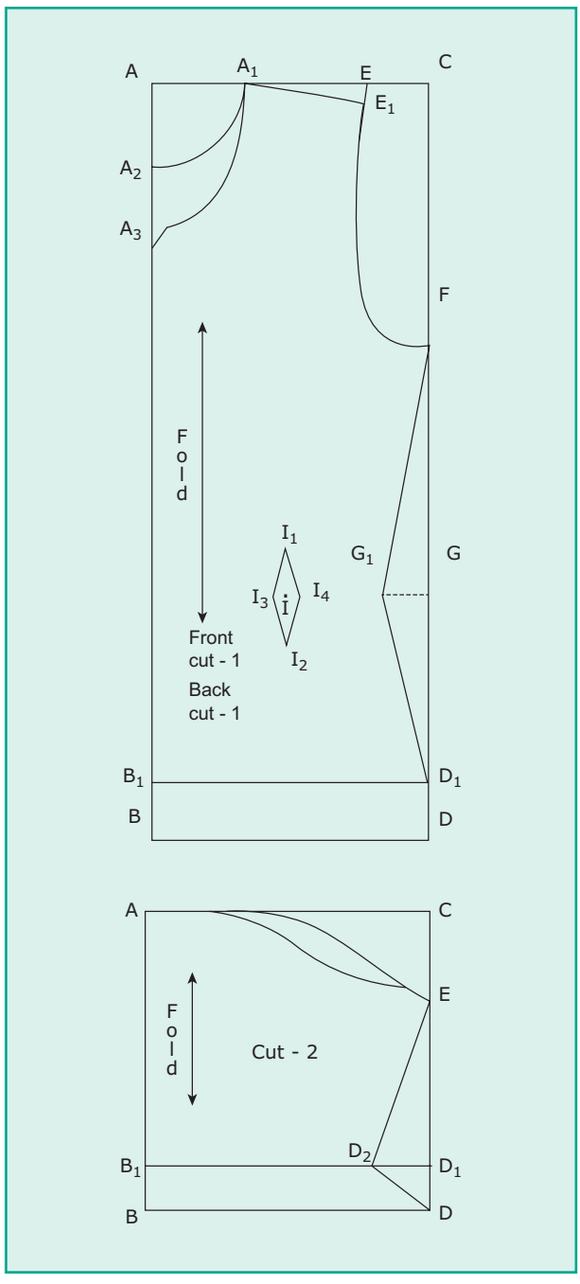
Particulars	Measurements
Length	34 cm
Chest	60 cm
Shoulder width	24 cm
Sleeve length	11 cm

Blouse

Drafting Method

Bodice:

S.No.	Description	Drafting
1	AB	Length + 5 cm
2	$BB_1 = DD_1$	5 cm
3	AC	¼ Chest + 2
4	AA_1	6 cm
5	AA_2	5 cm
6	AA_3	8 cm
7	AE	½ shoulder width
8	CF	¼ chest + 2
9	EE_1	1 cm
10	G	½ FD1
11	GG_1	1 cm
12	$II_1 = II_2$	6 cm
13	$II_3 = II_4$	2 cm



Sleeve:

SI. No.	Description	Drafting
1	AB	Sleeve length + 5 cm
2	AC = BD	¼ Chest + 1 cm
3	CE	1/12 Chest
4	$BB_1 = DD_1$	5 cm
5	D_1D_2	2 cm

XI_EM_TDD_PRACTICALS_2022.indd 240 24-01-2023 14:09:43

Cutting Lines

Front Bodice	A_3 - A_1- E_1 - F - G_1 - D_1- D – B
Back Bodice	A_2- A_1- E_1- F- G_1- D_1- D- B
Sleeve	A - E- D_2- D - B

Components and Cut Number

Blouse Front Bodice - 1
Blouse Back Bodice - 1
Sleeve - 2

Marking and Cutting

- Place the paper patterns of the blouse on the fabric and mark using marking chalk.
- Complete the pattern by marking notches and the pattern information should be written on the pattern using blue colour pencil for back patterns and red for front patterns. Care should be taken to draw dotted lines to indicate cutting lines and bold lines for sewing.
- Cut the fabric through the marked line using shears.

Sewing Procedure - Basic Blouse

Step 1: Two-piece placket is used at the back panel

Step 2: Left panel is attached with binding of 2.5 cm width (overlap)

Step 3: Right panel is attached with facing piece (underlap)

Note: For girls, the right panel should be over the left panel

Step 4: Join the front and back shoulders with a plain seam at a distance of 1cm.

Step 5: Attach binding of 4 cm width to the neck line.

Step 6: Stitch leaving 1 cm from neckline edge.

Step 7: Turn the binding to the wrong side and give an edge stitch.

Step 8: Join side seams with a plain seam and over lock the edges

Step 9: Fold 1 cm seam and 2 cm hem allowance and finish.

Step 10: Join sides of sleeve with a plain seam and over lock the edges

Step 11: Attach the sleeve onto the bodice part.

Step 12: Make darts in front and back bodice part.

Step13: Fold the hem allowance to 1cm and refold by 2 cm and give an edge stitch.

Step14: Attach hooks and eye in the front placket

Conclusion

- Understood the basic measurements required for pattern drafting of plain blouse and how to take these measurements.
- Acquired skills in drafting and constructing of a Plain blouse.

XI_EM_TDD_PRACTICALS_2022.indd 241 24-01-2023 14:09:44

Video Suggestions:

S. No	Title/purpose	Link
1.	Plain blouse drafting, cutting and stitching	https://youtu.be/uOEl5Bo0u_4
2.	Plain blouse drafting, cutting and stitching (From Saree)	https://youtu.be/6vgQ0x3ToLo

Simple Assessments:

Draw any three styles of Plain blouse designs.

Cost Sheet

S No	Name of the Equipment's/ components required	Range/ Specifications	Quantity	Cost (approx.)	Value in the nearby store
1.	Fabric	White Poplin	1 meter	40	
2.	Thread	White	1 reel	5	
3.	Hook and Eye	Standard	6	10	
4.	CMT (Cutting, Making and Trimming)	Standard		50	
			Wages and overhead : 25% of Material Cost		
			Total Cost to create/service on the product		
			Selling price in the market		
			Profit		

5 SHORTS WITH ELASTIC

Introduction

Shorts are lower garments worn by boys and men. Its length can vary from thighs to knees. Pockets can be attached and the waist line is normally finished using elastic. It is also known as half trouser.

Age Group: 3 years

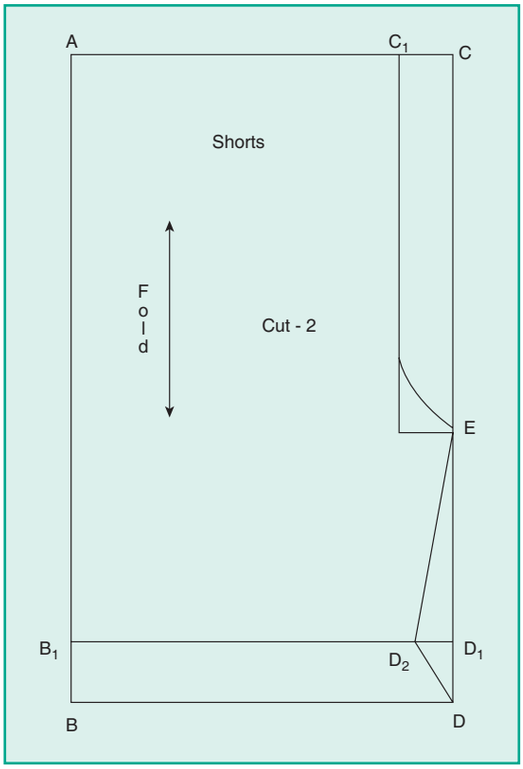
Particulars	Measurements
Length	30 cm
Hip	67 cm

Shorts

XI_EM_TDD_PRACTICALS_2022.indd 242 24-01-2023 14:09:44

Drafting Method – Shorts with Elastic

S. No.	Description	Drafting
1	AB = CD	Length + 5 cm
2	AC = BD	1/3 hip
3	$BB_1 = DD_1$	5 cm
4	CC_1	5 cm
5	CE	1/3 hip
6	D_1D_2	2 cm



Cutting Lines

A - C_1 - E - D_2 - D – B

Components and Cut Number

Shorts Front- 2

Shorts Back- 2

Marking and Cutting

- Place the paper patterns of the components on the fabric and mark using marking chalk.
- Complete the pattern by marking notches and the pattern information should be written on the pattern using blue colour pencil for back patterns and red for front patterns. Care should be taken to draw dotted lines to indicate cutting lines and bold lines for sewing.
- Cut the fabric through the marked line using shears.

Sewing Procedure - Shorts with Elastic

Step 1: Stitch the inside leg seam of both panels with a plain seam.

Step 2: Overlock the edges

Step 3: Join the crotch with a plain seam

Step 4: Over lock the edges

Step 5: Fold the edges of the hem line (by 1 cm) and refold it with 2 cm edge stitch and the bottom hem line.

Step 6: Insert an elastic and complete the waist line with casing as a casting at the waist line.

Conclusion

- Understood the basic measurements required for pattern drafting of shorts and how to take these measurements.
- Acquired skills in construction of shorts.

XI_EM_TDD_PRACTICALS_2022.indd 243 24-01-2023 14:09:44

Video Suggestions:

S. No	Title/purpose	Link
1.	Drafting, cutting and stitching for Shorts.	https://youtu.be/YF35ir32DbI
2.	Drafting, cutting and stitching for Shorts.	https://youtu.be/8wo8VMSE_z0

Simple Assessments:

List and sketch 3 different types of pockets which can be attached to shorts.

Costing Sheet:

Sl. No	Name of the Equipment's/ components required	Range/ Specifications	Quantity	Cost (approx.)	Value in the nearby store
1.	Fabric	White Poplin	1 meter	40	
2.	Thread	White	1 reel	5	
3.	Elastic	White	.25 meters	10	
5.	CMT (Cutting, Making and Trimming)	Standard		50	
			Wages and overhead : 25% of Material Cost		
			Total Cost to create/service on the product		
			Selling price in the market		
			Profit		

6. ONE-PIECE SHIRT

Introduction:

Shirt is an upper garment worn by men and boys. It is usually stitched with collar and miter placket. Yokes and full sleeves are incorporated in men's formal shirts.

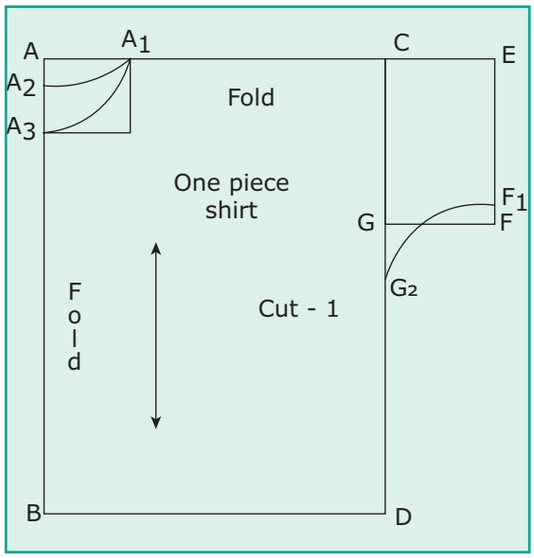
Age group – 3 years

Particulars	Measurements	Shirt
Length	45 cm	
Chest	60 cm	
Shoulder width	24 cm	
Sleeve length	6 cm	
Neck	26 cm	

XI_EM_TDD_PRACTICALS_2022.indd 244 24-01-2023 14:09:44

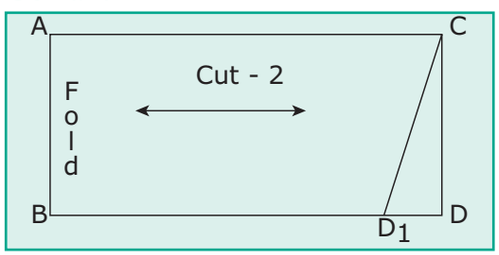
Drafting Method

One Piece Shirt



S.No.	Particulars	Drafting
1	AB = CD	Full length + 3 cm
2	AC = BD	¼ Chest + 4 cm
3	AA_1	4 cm
4	AA_2	4 cm
5	AA_3	6 cm
6	CE = GF	Sleeve length
7	EF = CG	1/6 Chest
8	FF_1	2 cm
9	$G G_1$	2 cm

Collar:



1	AB = CD	8 cm
2	AC = BD	½ neck + 3 cm
3	DD_1	1 cm

Cutting Lines

Bodice Front	A_3- A_1- C- E- F_1-G_2- D- B
Bodice Back	A_2- A_1- C- E- F_1-G_2- D- B
Collar	A-C-D_1-B

Components and Cut Number

Shirt Front - 1
Shirt Back - 1
Placket - 1
Collor - 2

Marking and Cutting

- Place the paper patterns of the shirt on the fabric and mark using marking chalk.
- Complete the pattern by marking notches and the pattern information should be written on the pattern using blue colour pencil for back patterns and red for front patterns. Care should be taken to draw dotted lines to indicate cutting lines and bold lines for sewing.
- Cut the fabric through the marked line using shears.

Sewing Procedure – One Piece Shirt

Step 1: Attach a miter placket to the center front placket opening

Step 2: Join the sides with plain seam and over lock the edges.

Step 3: Fuse the interlining on one piece of collar

Step 4: Place the collar pieces right side together and sew the outer edges

Step 5: Trim and turn right side out.

Step 6: Press the collar firmly

XI_EM_TDD_PRACTICALS_2022.indd 245 24-01-2023 14:09:44

Step 7: Attach the collar to the neckline of bodice.

Step 8: Fold the raw edge of sleeves by 1 cm then refold by 2 cm and edge stitch the sleeve hem line

Step 9: Finish the shirt by edge stitching the hemline and folding the raw edges to 1 cm

Step 10: Refold the bottom hem line again by 2 cm and machine neatly.

Step 11: Attach button and buttonholes in the front placket

Conclusion:

- Understood the basic measurements required for pattern drafting one- piece shirt and how to take these measurements.
- Acquired skills in constructing one piece shirt.

Video Suggestions:

S. No	Title/purpose	Link
1.	Drafting, cutting and stitching for One piece shirt	https://youtu.be/mo0gNPtt-Aw?list=RDCMUCW_LvHVgdSU8U1UzckIcKRA

Simple Assessments:

Draw any 3 different shirt patterns.

Costing Sheet

S No	Name of the Equipment's/ components required	Range/ Specifications	Quantity	Cost (approx.)	Value in the nearby store
1.	Fabric	White Poplin	2 meter	80	
2.	Thread	White	1 reel	5	
3.	Interlining	White	.25cm	25	
4.	Button	Plain white	12	10	
5.	CMT (Cutting, Making and Trimming)	Standard		100	
			Wages and overhead : 25% of Material Cost		
			Total Cost to create/service on the product		
			Selling price in the market		
			Profit		

XI_EM_TDD_PRACTICALS_2022.indd 246 24-01-2023 14:09:44

PROJECT

Any one of the projects can be assigned to the students.

A period of 30 days can be given to complete the project.

1. Draft and prepare the instructions, and construct a Jabla or Romper, with minimum two variations.

2. Take body measurements of 25 classmates either girls or boys and prepare body measurement chart.

INDUSTRIAL EXPOSURE

1. **Visit a garment industry or boutique shops and conduct a survey. Collect information about the following:**

   - Name and address of the garment industry /boutique
   - Name of the industry/boutique owner
   - Type of garment industry /Boutique (stand alone or Chain boutique)
   - Number of persons working
   - Types of jobs carried out by the workers
     - Designing
     - Drafting
     - Pattern making
     - Cutting
     - Sewing (Types of sewing machines used)
     - Folders/Special attachments used
     - Any surface embellishment work done
     - Type of pressing, inspection and packing
   - What are the types of garments made in garment industry/boutique?

XI_EM_TDD_PRACTICALS_2022.indd 247 24-01-2023 14:09:44

MODEL QUESTION PAPER

1. Jabla and Panty (1 year)

a. Write the instruction for drafting jabla and panty with suitable figures

b. Draft and cut the paper pattern

c. Stitch the jabla and panty

(i) Finish the side with flat felt seam.

(ii) Finish the panty leg opening

(iii) Finish neckline, hemline and sleeve with piping (or) facing

2. Romper (1 year)

a. Write the instruction for drafting for romper with suitable figures

b. Draft and cut the paper pattern

c. Stitch romper

(i) Attach miter placket at the neck opening

(ii) Finish neckline, armcyce and leg opening with facing / binding

(iii) Attach an applique in the front bodice pattern

3. Baby Frock (3 years)

a. Write the instruction for drafting a baby frock with suitable figure

b. Draft and cut the paper pattern

c. Stitch baby frock

(i) Finish armhole with puff sleeve and a piping to the sleeve hem line

(ii) Do continuous opening at back and attach hook and eye

4. Plain blouse (3 years)

a. Write the instruction for drafting for plain blouse with suitable figures

b. Draft and cut the paper pattern

c. Stitch the plain blouse

(i) Do two piece placket in front opening and attach hook and eye

(ii) Modify the neck line as square shape and finish with a fitted facing

5. Shorts with elastic (3 years)

a. Write the instruction for drafting shorts with elastic

b. Draft and cut the paper pattern

c. Stitch shorts with elastic

(i) Finish waistline with elastic

(ii) Finish hemline with hand hemming

(iii) Construct an inseam pocket at the side seam

6. One piece shirt (3 years)

a. Write the instruction for drafting one piece shirt with suitable figures

b. Draft and cut the paper pattern

c. Stitch one piece shirt

(i) Finish neckline with miter open

(ii) Finish neckline with collar

(iii) Attach a patch pocket

XI_EM_TDD_PRACTICALS_2022.indd 248 24-01-2023 14:09:44

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XI_EM_TDD_PRACTICALS_2022.indd 249 24-01-2023 14:09:44

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