UNIT-4: SURFACE ORNAMENTATION

In the last three decades, Indian textile industry has witnessed drastic changes. The competitive atmosphere and quality consciousness, has reached a new mark. With the steady improvement in technology and application standards, a gradual rise was observed in consumer demands. And to reach up to that mark, a manufacturer has to add something to their products to get some added value for their product. This value added products not only reward with considerable increase in profit but also build the brand image.

This part of the course introduces the students to the knowledge and skill of ornamenting the fabric for value addition. There are various techniques of adding value on textiles like embroidery, appliqué, patch work, dyeing, printing, etc.

4.1 EMBROIDERY

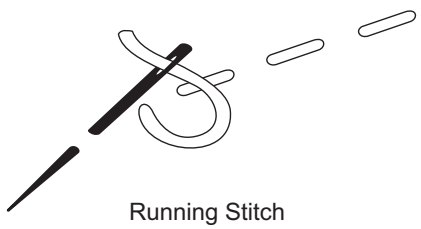
Embroidery is the art or handicraft of decorating fabric or other materials with needle and thread or yarn. There are different types of embroidery which are known by special names such as cut work, appliqué work, drawn thread work, smocking, etc. Embroidery may also incorporate other materials such as, pearls, beads, mirrors, metal strips, sequins, etc. Embroidery is done by hand and machine. Initially, wool, linen, and silk have been in use for thousands of years but today, embroidery is practiced with cotton, rayon, wool, silk, zari, etc.

4.1.1 Common Embroidery Stitches

In general embroidery stitches are worked with two strands of embroidery skein. Sometimes more strands may be used for special effects. In the beginning and ending of the stitches avoid using knots. Begin with a back stitch leaving a short length of the thread (about 2 inches) extending on the wrong side which can be caught and held under the first few embroidery stitches. To end the work, take the thread to the wrong side and work a back stitch again.

a) Running Stitch

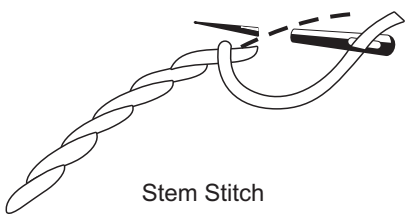
This is an easy outline stitch which can be equal or unequal. Work the stitch from right to left. Bring the needle up at one point and down at the second point as in fig. Pick several stitches on needle at a time before pulling it through.



Running Stitch

b) Stem Stitch

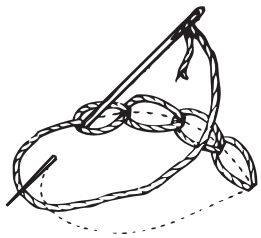
This is a line stitch used for outlining designs especially stems and leaves. It can also be used for filling small designs by working several lines side by side. Work should be done from the bottom upwards each time taking a stitch almost vertically down, but with a slight slant as shown in the fig.



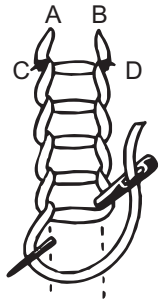
Stem Stitch

c) Chain Stitch

This is one of the most popular embroidery stitches for outlining or worked in close rows for filling an area. Work the stitches towards you starting from the top of the line. Bring the thread out to the right side of fabric. Insert needle in the fabric at the same point, holding the thread down with your left thumb. Bring needle point out a short distance ahead and pull it through, keeping the working thread under the needle. The result is a loop as shown in the fig above. Other variations in the basic chain stitch that can be worked are **open chain, twisted chain,** square chain, etc.



Chain Stitch

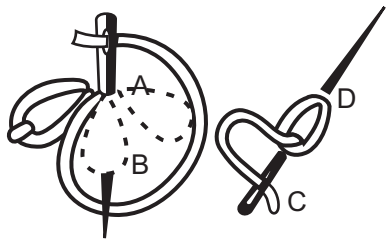


Twisted Chain

Open Chain Stitch

d) Lazy Daisy Stitch

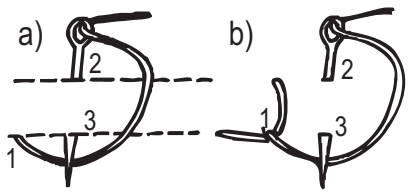
This is an elongated chain stitch used to work petals of small flowers. Bring the thread out on the right side near the base of one petal. Take a long stitch, length of a petal and pull the needle through the fabric, looping the thread under the needle. To hold the end of the loop in place insert the needle down over the thread that forms the loop. Bring out the needle again near the base of next petal as shown in the fig.



Lazy Daisy Stitch

e) Blanket Stitch

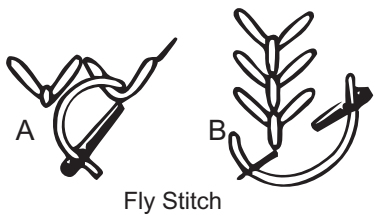
This stitch is used as edging for blankets and other articles or as part of design for which the blanket stitch makes the border. The work should be done from left to right, stitching towards you. Bring thread out on the lower line, insert needle in position on upper line and take a downward stitch with the thread under the needle point. Draw out the thread as shown in the fig. Stitches may be of the same size at regular distances apart or grouped as spaced according to the effect desired.



Blanket Stitch

f) Fly Stitch

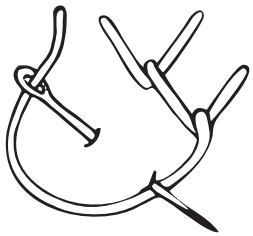
This is an open chain stitch done as V. Work from left to right, bring needle out at a point which will be the top of left side of V. Hold thread down with left thumb, insert needle at the top of the right side of the V and bring it out at the base of the V, keeping the working thread under the needle.



Fly Stitch

Draw out the thread and reinsert the needle below the base of the V to hold the loop in place as shown in the fig.

g) Feather Stitch



Feather Stitch

The working of this stitch is similar to that of blanket stitch, but the stitches slant towards a centre line from either side. First mark a line lightly to indicate the centre line. Work from top to bottom, bring needle out at the beginning of the marked line. Hold the thread down along the centre line. Starting from the right of the line take a stitch with the needle slanting downwards, and bring it out on or near the centre line with the thread held under as shown in the fig. Pull the needle through, and take the next stitch from the left of the line with the needle slanting down and to the right.

h) Buttonhole Stitch

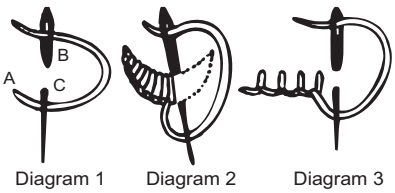
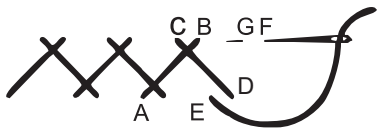


Diagram 1 Diagram 2 Diagram 3

Buttonhole Stitch

It is worked like the basic blanket stitch, except that the stitches are placed very close together to form a firm edge as shown in the fig. This stitch is particularly used in cutwork embroidery. A button whole stitch wheel is a popular method for doing flowered motifs.

I) Herringbone Stitch



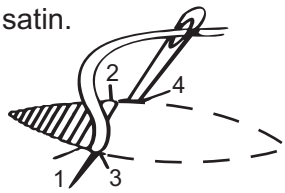
Herringbone Stitch

This is used as a decorative stitch as well as for finishing hems and raw edge seams also. Stitches are worked from left to right along two parallel lines. Bring out the thread at the bottom left hand corner of the work. Insert needle on top line at a point away to the right and take a short stitch through the fabric from right to left so as to get a slanting stitch. Next take a short stitch through the fabric from right to left on the lower line to get another slanting stitch crossing the first one at a point little below the top line as shown in fig. On the wrong side two rows of running stitches are seen. This stitch can be done in the reverse way and used as **shadow work**.

j) Filling Stitches

A couple of stitches are used in embroidery for outlining or filling in spaces or motifs or centre of objects for decorative purposes. Chain, stem, running, french knots, seed stitches, button hole, fishbone, etc are commonly used as filling stitches also. The other commonly used filling stitches are basic satin and long and short satin.

Basic Satin Stitch



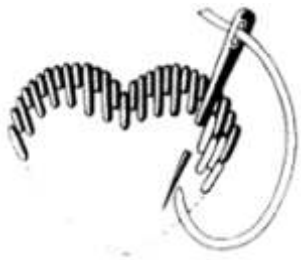
Basic Satin Stitch

This is a filling stitch used to cover regular or irregular shaped spaces. Bring the needle out at the starting point on the right side and take a stitch carrying the

thread across the design and bringing the needle back very close to the starting point. Continue the stitches very closely and evenly till the entire space is filled.

Long and Short Stitch

This is used for filling large shapes and for shading areas in design. Firstly, one row of alternatively long and short stitches are worked side by side closely following the outline of the shape. In the succeeding rows, stitches of equal length about the same as the longer stitch of the first row are worked. In the final row, the stitches should end on the edge of the design. The direction in which the long and short stitches fall is very important for proper shading effect. Before starting, decide the direction in which the stitches will take within each shape.



Long and Short Stitch

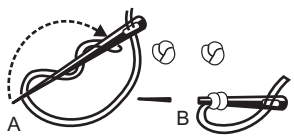
k) Couching Stitch

Lay a single cord or a number of threads of either matching or contrasting color on the line of the design. Catch the laid thread down firmly with another thread of desired color by working small stitches at regular intervals across it as shown in the fig.

Couching Stitch

l) French Knot

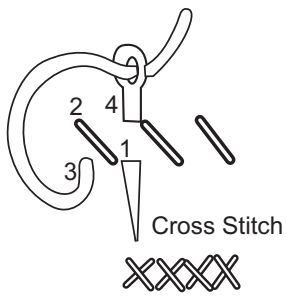
This resembles a knot and is usually applied to the centre of flower. Bring out the thread to the right side. Hold the thread tight with left thumb and wind three to four times around the needle. Now holding the thread firm, insert needle in fabric close to where it first emerged as show in fig. Pull thread to the wrong side and bring out the needle to the point where the next knot is to be worked.



French Knot

m) Cross Stitch

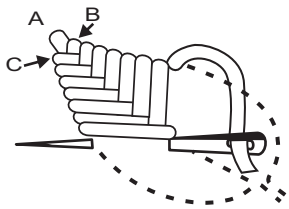
This stitch is suitable to be applied on fabrics with small checks or thick yarns which can be counted. Stitches are worked diagonally from left to right or right to left along two parallel lines. After completing the first round of crosses, work in the opposite direction filling in the second half of crosses as shown in the fig.



Cross Stitch

n) Fishbone Stitch

It is another leaf filling stitch. Its finished effect is similar to a fish bone with a spine down the centre. Bring needle up at point 1 and take a small stitch 2 down the centre line. Bring needle up at 3, insert at 4 directly across from point 3. Exit out from 2, carry yarn under needle point and pull through as

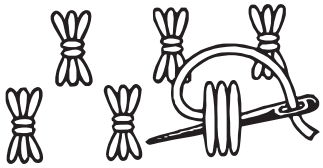


Fishbone Stitch

shown in the fig. Proceed to next stitch. Now point 2 is point 1 of next stitch.

o) Sheaf Stitch

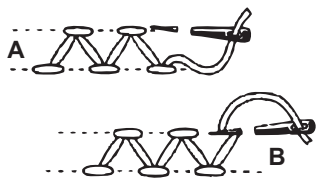
The Sheaf Stitch is commonly used in smocking. However, it would make a striking and bold border if repeated all across the row. First, three long vertical **straight stitches** are worked fairly loosely. Bring the needle up on the left side of the second pleat, and thread the needle under the first Straight Stitch without piercing the fabric. Now thread the needle under all three stitches, without piercing the fabric as shown in the figure. Pull gently to draw the straight stitches together.



Sheaf Stitch

p) Chevron Stitch

This stitch is worked in two lines. Bring the thread through on the lower line on the left side, insert the needle a little to the right on the same line and take a small stitch to the left, emerging at center of the stitch being made. Next, insert the needle on the upper line a little to the right and take a small stitch to the left (A). Insert the needle again on the same line a little to the right and take a small stitch to the left, emerging at center (B). Work in this way alternately on the upper and lower lines.



Chevron Stitch

4.2 DYEING AND PRINTING

Dyeing is the method of coloring the fibre, yarn or fabric using coloring solution i.e., the dye solution. Dyes are coloring substances that are dissolved in water and through a chemical reaction impart a particular hue to the fabric with affecting the feel or hand of the fabric. Dyes can be categorized into:

Natural Dyes	Synthetic Dyes
Historically, the primary source of dye, has generally been nature, with the dyes being extracted from animals or plants. Since the mid-18th century, however, humans have produced artificial dyes to achieve a broader range of colors and to render the dyes more stable to resist washing and general use.	Artificial dyes had their beginning in 1856, when an English chemist, H. W. Perkin, working with coal tar in his laboratory, accidentally discovered the first coal-tar color, a beautiful mauve. A little later, a French chemist discovered the way of getting magenta by means of the same substance, coal tar. In the last fifty years several hundred colors have been produced.
They are obtained from natural resources i.e., leaves, flowers, fruits, roots, bark, stem and seeds, etc.	They are chemical based and available in powder form, pigment form, etc.

Vegetable colors are extracted from logwood, indigo, fustic, cutch, butternut, sumac, madder, brazilwood, safflower, sapanwood, peachwood, camwood, Persian berries, turmeric, saffron, henna, pomegranate rind, etc. Cochineal, an insect, yields a natural dyestuff. Several minerals are also used, as, for example, prussian blue, chrome yellow, and iron buff.	Dyestuffs are now divided by dyers and chemists into the following large classes - acid dyes, basic dyes, direct or substantive cotton dyes, sulphur dyes, mordant dyes, vat dyes, disperse dyes, etc.

Printing is an art, which may be defined as localized dyeing which in turn produces designs in numerous innovative ways. Over centuries, a variety of techniques for printing have been evolved. The application of pattern on to fabric by the use of dyes, pigments or other coloring substances was influenced by a variety of hand and machine processes. The design is transferred on a flat surface using device coated with dye, by simply stamping on to the fabric. The same design may be repeated many times across the fabric and this is called repeat.

Printing can be done manually otherwise called as block printing, screen printing, stencil printing and can also be done on machines most commonly done by flat bed printing, roller printing, discharge printing, etc.

4.2.1 Styles of Printing

There are three basic types of printing - direct, discharge and resist.

1. Direct Printing

The most common and direct approach to apply color pattern on the fabric is by directly printing on a white or dyed background using some coloring agent which is prepared in the form of a paste. The printing paste is prepared by dissolving a known quantity of dye in limited amount of water to which a thickening agent gums, glues, alginates, resins etc may be added to provide necessary viscosity to the paste. Pigment printing is done without thickeners and is used as such; the consistency is obtained by mixing resins, solvents and water in required proportion.

2. Discharge Printing

It is another approach of applying color to the fabric. The color is destroyed or removed from the designed areas of the piece dyed fabric. Sometimes the ground color is removed and printed with another color in its place. Usually, a white or light pattern is desirable to enhance the bright and dark ground color.

3. Resist Printing

In this method, a substance impermeable to dye or water is coated on the fabric in prescribed area which prevents the absorption and penetration of the dye. The resisting agent seals the air pores in the fabric, thus making it non-porous. The resisting agents used may be natural or of synthetic origin e.g., starch, wax, clay, resins, glue, gum, gelatin and synthetic or chemical agents.

4.2.2 Methods of Printing

Patterns produced in different colors and style often add value to enhance the aesthetic appeal, add variety, novelty, symbolism and is a means of expression. As often color gives meaning to the design, design in turn gives meaning to colors. There different methods of printing that are practiced. Some common techniques are as below:

i. Stencil Printing

It was first started in China and Japan. Stencils are templates with design cut out on card board, wood, metal, plastic or sturdy film or a wax coated paper. The design can be fine and delicate with large spaces sufficient enough for great amount of color to be applied. Color is usually spray painted or stamped with a brush in the cut out areas of the stencil. Separate stencils are used for different colors in a particular design or pattern. However, stencil printing is limited to few colors only.

Fig. 14 Stencil Printing with brush

ii. Screen Printing

This printing was also know as silk screen printing, as the screen was made with a silk bolting cloth. In this method, the design is transferred on to a woven fabric with open mesh areas so that the printable materials can be pressed through the mesh. A squeezee is moved across the screen stencil, forcing print material through the mesh openings.

There are two types of screen printing techniques that are generally used.

a. Flat screen printing
b. Rotary screen printing

Fig. 15 Screen Printing

iii. Block Printing

It is one of ancient techniques of printing on fabric by using wooden blocks. It is popular in India and in many other parts of the world even today. It is evident from the history that man knew printing even before 2000

years. Blocks are made of wood with design engraved on the flat surface so that the raised portions of design helps to take the printing paste gets imprinted when stamped. Separate blocks are used for each color. Since block printing is a manual process, it is found to be slow and time consuming. Now-a-days, design is affixed with metal wire which gives a fine print when stamped.

Fig. 16 Block Printing Process

iv. Roller Printing

It involves a series of rollers as in rotary printing. Separate rollers are used for printing different colors. About 16 colors can be printed in a design. The diameter of the roller designates one repeat. The rollers are made of copper with chromium plating for more durability. The design roller is transferred either by photoengraving or pantograph. The rollers are arranged in order on the machine and the fabric to be printed moves over a rotating drum. The roller with design rotates against a moving brush that supplies the color from roller and a doctor blade scrapes of the excess dye from the roller.

Fig. 17 Roller Printing Machine

v. Transfer Printing

A type of printing process also called sublimation (changing from solid to gaseous state) printing is the technique in which the design from one surface is transferred to the other. The heat transfer printing method uses heat and pressure to transfer an image or design from a piece of transfer paper to the desired object. In this method pigments in paraffin or thermoplastic base can be melted and bound on to the fabric surface by application of heat and pressure. An effective method of transfer printing involves transferring a design by vapourizing if from a paper to the cloth by two methods: dry heat transfer and wet heat transfer.

Fig.18 Heat transfer printed T-Shirt

4.3 RESIST DYEING TECHNIQUES

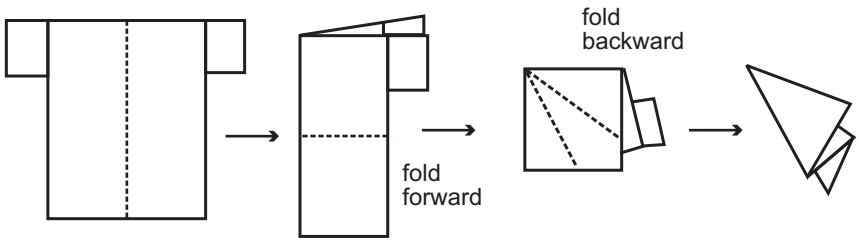
Resist Dyeing is a term for a number of traditional methods of dyeing textiles with patterns. Various methods are used to "resist" or prevent the dye from reaching the cloth, thereby creating a pattern and ground. The most common forms used are wax, some type of paste, or a mechanical resist that manipulates the cloth such as tying or stitching, clamping,

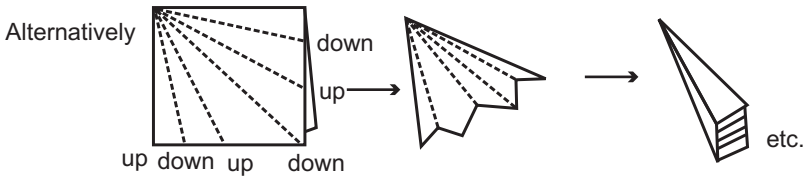
folding, etc. Another form of resist involves using a chemical agent in a specific type of dye that will repel another type of dye printed over the top. The most well-known varieties today include tie and dye, batik, block printing and stencil printing.

4.3.1 Different Techniques of Resisting a Fabric

1. Fold Resist

The fabric is crumpled, knotted or pleated into folds. Thus, when dipped into the dye, the solution cannot penetrate into the folds. A blurred pattern according to the fold is obtained.





2. Stitch Resist

The design or folds or pleats are fixed by stitching through them or leading threads through the material in simple running stitches. Then the fabric is pushed or drawn close together as possible which are knotted on the ends. Folds and perforations and sometimes the thread form the pattern. The Indonesian term for this technique is tritik.


Stitch Resist

3. Wrap Resist

Rolled or folded material is partially wrapped in such a way that no dye can penetrate the reserved places. Simple wrappings yield stripped patterns. If the material is folded in a second direction after the first dyeing, a chequered design is got.


Wrap Resist

4. Tie Resist


Tie Resist

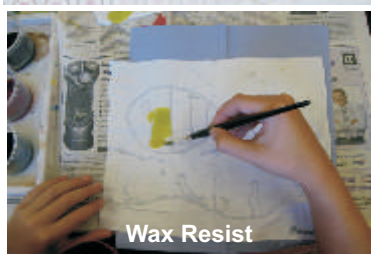
Individual parts of the outspread fabric are lifted and completely or partially tied in such a way that, a spherical or mould like forms are got. Variations are possible by different ways of folding the material.

5. Stencil Resist


Stencil Resist

Stencils that prevent dyes from penetrating into the fabric are fixed on it before the color is applied. This method is more suitable for painting or for spraying the dye on the fabric than for dyeing textiles from the open areas.

6. Wax Resist


Wax Resist

Parts of the fabric are sprayed, painted or coated with molten wax, which when on drying become hard. They then serve as reserves which can be removed after dyeing by immersing in hot water, and by washing, dissolving or rubbing off.

The other methods of resisting used are mordant resist, mud resist and yarn resist methods.

4.3.2 Techniques

Most common resist dyeing techniques are tie and dye, batik, block printing, stencil printing, etc.

i. Tie and Dye


Fig. 19 Tie and Dye on Fabric

It is an ancient craft in Africa, Indonesia and India flourishing as a craft even today. Tie-dye is a process of tying and dyeing a piece of fabric or cloth which is made from knit or woven fabric usually cotton; typically using bright colors. It is a modern version of traditional dyeing methods used in many cultures throughout the world.

Tie-dyeing is accomplished by folding the material into a pattern, and binding it with string or rubber bands. Dye is then applied to only parts of the material. The ties prevent the entire material from being dyed. Designs are formed by applying different colors of dyes to different sections of the wet fabric. A wet fabric is much easier to dye than a dry fabric. Once complete, the material is rinsed, and the dye is set.

The dyeing in tie an dye always progresses from lighter shade to darker. Bind the white fabric together to resist the penetration of the first dye usually a light color like yellow. The cloth is allowed to dry and without untying the second time the fabric is tied and dyed

in the next color, say red and then repeat the process of drying and tie the fabric for resisting the second color and dye in the third color. In this manner the process is continued for some more color.

ii. Batik

Batik is the word that describes a form of resist dyeing or printing. Batik cloth was produced originally in Java. In Africa it is being a village craft, in India as a handicraft people are engaged in producing export quality wall hangings, domestic utility products. But in the recent years this craft is practiced in various parts of the world. The special feature of batik is its crack effect of wax, which is deliberately allowed to form, enable the dye to penetrate and produce a threadwork of fine dyed veins on the cloth.

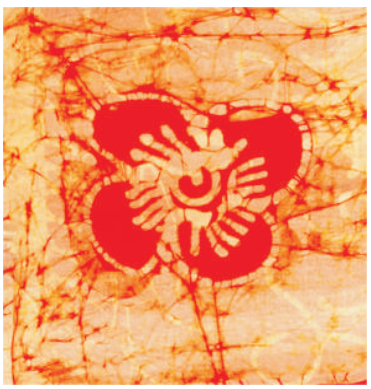


Fig. 20 Batik

To make batik, selected areas of the cloth are blocked out by brushing or drawing hot wax over them, and the cloth is then dyed. The parts covered in wax resist the dye and remain the original color. This process of waxing and dyeing can be repeated to create more elaborate and colorful designs. After the final dyeing the wax is removed and the cloth is ready for wearing or showing.

iii. Block Printing

India has been renowned for its printed and dyed cotton cloth since the 12th century and the creative processes flourished as the fabric received royal patronage. Though the earliest records mention the printing centers in the south, the craft seems to have been prevalent all over India. This process, though considered by some to be the most artistic, is the earliest, simplest and slowest of all methods of printing.

Fig. 21 Hand Block Printing

The method of hand printing of textiles is found all over India. The important cotton printing centers are in the desert regions of Gujarat and Rajasthan. Alizarin, indigo and many vegetable colors are used for hand painting in these regions. Direct printing is popular throughout India and it involves a bleached cotton or silk fabric printed with the help of carved wooden blocks. In hand block printing around three or four colors are generally used. Block printing was generally done with vegetable dyes but with advent of synthetic dyes, the ease of usage and the availability of synthetic dyes have replaced the vegetable dye in many cases.

Many of regions in India got inspired by the hand block prints and practiced this technique, the popular block printed textiles of India to name some are:

- Bagh prints - Madhya Pradesh
- Bagru, Dabu, Sanganeri prints - Rajasthan
- Kalamkari - Andhra Pradesh
- Ajrakh prints - Gujarat

Although, these printed textiles are popular some of Punjab, Maharashtra also practiced this technique. However, the major block printing centres are:

Major Centers of Hand Block Printing

S. No.	State	Places
1.	Rajasthan	Jaipur, Sanganer, Bagru, Farukhabad, Udaipur, Jodhpur, Kaladera, Jaisalmar
2.	Gujarat	Ahmedabad, Bhavnagar, Vasna, Rajkot, Jamnagar, Jetpur, Surat, Porbandar, Pethapur, Dhamadka, Khavda and Bhuj
3.	Tamil nadu	Tanjore
4.	Andhra Pradesh	Masulipatnam
5.	Madhya Pradesh	Bagh in Dhar district

Block printing by hand is a slow process it is, however, capable of yielding highly artistic results, some of which are unobtainable by any other method.

iv. Stencil Printing

The art of stenciling is very new. It has been applied to the decoration of textile fabrics from time immemorial by the Japanese, and, of late years, has found increasing employment in Europe for certain classes of decorative work on woven goods for furnishing purposes.

Fig. 22 Stencil Printed Fabric

The pattern or design is cut out of a sheet of stout paper or paper dipped in wax or thin metal with a sharp-pointed knife. The portion of the design where color has to be applied is cut out with a sharp-pointed knife and the uncut portions represent uncolored portion of the design. The sheet is now laid on the material to be decorated and color is brushed through its interstices.

A suitable planning is required before printing. Separate stencils are to be used for different colors.

SUMMARY

In the last three decades, Indian textile industry has witnessed drastic changes. The competitive atmosphere and quality consciousness, has reached a new mark. With the steady improvement in technology and application standards, a gradual rise was observed in consumer demands. And to reach up to that mark, a manufacturer has to add something to their products to get some added value for their product.

There are various techniques of adding value on textiles like embroidery, appliqué, patch work, dyeing, printing, etc.

Embroidery is the art or handicraft of decorating fabric or other materials with needle and thread or yarn. There are different types of embroidery which are known by special names such as cut work, appliqué work, drawn thread work, smocking, etc. Embroidery may also incorporate other materials such as, pearls, beads, mirrors, metal strips, sequins, etc. Embroidery is done by hand and machine.

Some of simple embroidery stitches like, running, chain, stem, satin, herringbone, fishbone, feather, fly, couching, etc may be used to ornament the fabric using simple embroidery threads and sometimes with a combination of beads, sequins, zardozi, pearls, stones, etc for addition ornamentation.

Dyeing is the method of colouring the fibre, yarn or fabric using colouring solution i.e., the dye solution. **Printing** is an art, which may be defined as localized dyeing which in turn produces designs in numerous innovative ways. Over centuries, a variety of techniques for printing have been evolved. The application of pattern on to fabric by the use of dyes, pigments or other colouring substances was influenced by a variety of hand and machine processes.

There are three basic types of printing - direct, discharge and resist. The different methods of printing that are practiced are **stencil, block, screen, roller, transfer printing techniques**.

Resist dyeing is a term for a number of traditional methods of dyeing textiles with patterns. Various methods are used to "resist" or prevent the dye from reaching the cloth, thereby creating a pattern and ground. The most common forms used are wax, some type of paste, or a mechanical resist that manipulates the cloth such as tying or stitching, clamping, folding, etc.

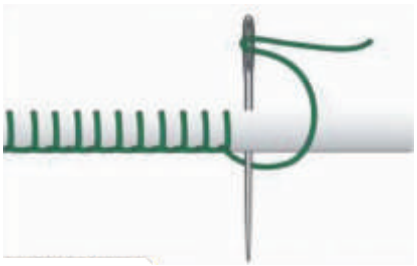
Most common resist dyeing techniques are tie and dye, batik, block printing, stencil printing, etc.

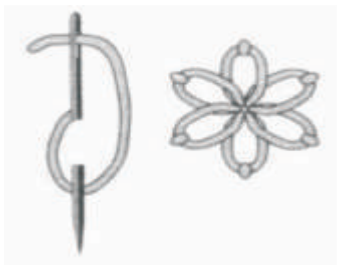
Test your learning:

I. Match the following stitch with the application

1.	Running stitch	(	)	filling leaf pattern
2.	Buttonhole stitch	(	)	outline stitch
3.	French knots	(	)	filling and shading areas
4.	Fish bone	(	)	cut work embroidery
5.	Long and short satin	(	)	centre of flowers

ii. Identify the following stitches:





_____ _____ _____

iii. Can you identify the following:

_____ _____ _____

iv. List some materials used for resisting the fabric in tie and dye

S. No.	Technique	Material Used
1.	Tie and Dye	
2.	Batik	
3.	Stencil Printing	
4.	Block Printing	