Introduction of Textiles:

A textile is a cloth, which is either woven by hand or machine. Textile has traditionally meant, “a woven fabric.” The term comes from the Latin word texere, meaning to weave. A textile or cloth is a flexible woven material consisting of a network of natural or artificial fibers often referred to as thread or yarn. Yarn is produced by spinning raw fibers of wool, flax, cotton or other materials to produce long strands. Textiles are formed by weaving, knitting, crocheting, knotting or pressing fibers together (felt).

**TEXTILE MANUFACTURING AND PRODUCTION METHODS:**

The traditional methods of manufacturing fabrics are weaving, braiding, crocheting, felting, tapestry etc. The following are some of the fabric manufacturing techniques:

1. **WEAVING:**

A major method of fabric construction is weaving. However, the process of interlacing, usually at right angles warp yarn with the inserted weft yarn in a definite order to form a fabric suitable for use as address material or industrial purpose is called weaving. The machine used for this purpose is called Loom. A set of longer threads is called the warp or end. A set of crossing threads is called the weft or pick. A loom is a device for holding the warp threads in place while the filling threads are woven through them. Some weaning is still done by hand, but the vast majority is mechanized.

1. **KNITTING:**

After weaving, the most prevalent method of fabric construction is knitting. Knitting is a method by which thread or yarn is turned into cloth or other fine crafts. The yarn in knitted fabrics follows a meandering path, forming symmetric loops or stitches. When the interlocking loops run lengthwise, each row is called a wale. A wale can be compared with the warp in weaving. When the loops run across the fabric, each row is called a course. A course corresponds to the filling, or weft.

1. **CROCHET:**

It is a process of creating fabric from yarn, thread or other material strands using a crochet hook. The word is derived from the French word “crochet”, meaning hook. Hooks can be made of materials such as metal, wood or plastic and are commercially manufactured as well as produced by artisans. Crocheting, like knitting, consists of pulling loops through other loops, but additionally incorporates wrapping the working materials around the hook one or more times.

Crochet differs from knitting in that only one stitch is active at one time; stitches made with the same diameter of yarn are comparably taller, and a single crochet hook is used instead of two knitting needles. Additionally, crochet has its own system of symbols to represent stitch types.

1. **FELTING:**

Felting is a non-woven cloth that is produced by matting, condensing and pressing woolen fibers together, and working them together until they become tangled. While some types of felt are very soft, some are tough enough to form construction materials. Felt can be of any color, and made into any shape or size. A liquid, such as soapy water, is usually added to lubricate the fibers and to open up the microscopic scales on strands of wool.

1. **TAPERTRY:**

It is a form of textile art, traditionally woven on a vertical loom; however it can also be woven on a floor loom as well. It is composed of two sets of interlaced threads, those running parallel to the length (called the warp) and those parallel to the width (called the weft); the warp threads are set up under tension on a loom, and the weft thread is passed back and forth across part or all of the warps. Tapestry is weft-faced weaving, in which all the warp threads are hidden in the completed work, unlike cloth weaving where both the warp and the weft threads may be visible. In tapestry weaving, weft yarns are typically discontinuous; the artisan interlaces each colored weft back and forth in its own small pattern area. It is a plain wet-faced weave having weft threads of different colors worked over portions of the warp to form the design.

1. **KNOTTING:**

A knot is a method of fastening or securing linear material such as rope by tying or interweaving. It may consist of a length of one or several segments of rope, string, webbing, twine, strap, or even chain interwoven such that the line can bind to itself or to some other object. The action or craft of tying knots in yarn to make carpets or other decorative items.

1. **LACE AND OTHERS:**

Lace is made by interlocking threads together independently, using a backing and any of the methods described above, to create a fine fabric with open holes in the work. Lace can be made by either hand or machine.

Carpets, rugs, velvet, velour and velveteen are made by interlacing a secondary yarn through woven cloth, creating a tufted layer known as a nap or pile.

**DIFFERENCE BETWWEN FABRIC AND CLOTH:**

The words fabric and cloth are used in textile assembly trades (such as tailoring and dressmaking) as synonyms for textile. However, there are subtle differences in these terms in specialized usage. Textiles refer to any material made of interlacing fibers. Fabrics refers to any material made through weaving, knitting, spreading, crocheting or bonding that may be used in production of further goods (garments, etc.) Cloth may be used synonymously with fabric but often refers to a finished piece of fabric used for a specific purpose (e.g. table cloth).

**RAW MATERIAL OF TEXTILE:**

Fibers are the raw material for all fabrics and textile.

**FIBERS:**

A fiber is defined as a unit of matter with minimum length of 100 times to its diameter, flexible and capable of being woven. Fibers are thin, flexible, hair like strands of matter that range in length from a few centimeters to hundreds of meters. Short fibers (from a few to many centimeters in length) are called staple fibers. Long continuous fibers are called filament fibers. A single elongated piece of a given material (fiber), roughly round in cross-section, often twisted with other fibers to form thread. The fibers used in the making of textile yarns or threads that can vary in size, shape, texture and color are typically categorized as natural or synthetic. Fibers can be natural like cotton or jute or they can be synthetic like nylon or polyester. For most of history, people had only natural fibers to use in making cloth. But modern science has learned how to produce fibers by chemical and technical means. Today, manufactured fibers account for more than two-thirds of the fibers processed by U.S textile mills.

**NATURAL FIBERS:**

These natural fibers come from plants, animals and minerals. They can be classified according to their origin.

**PLANT FIBERS**: The following are some of the popular plant fibers used in the textile industry:

1. Cotton:

Cotton fiber is obtained from the cotton plant. It is one of the traditional fibers used in the textile industry. Cotton fibers are used to make clothes and other products like towels, carpets or sheets. Clothes made out of cotton are especially light and comfortable.

1. Linen:

Linen fabric is obtained from the flax plant. It is a fiber that has been used in the textile industry since ages. The properties of linen fabric are very much similar to cotton fabric. However, it is stiffer as compared to cotton. Linen is usually used in the manufacturing of cloths and home linen.

1. Jute:

Jute is a natural fiber that has been used in the textile industry since centuries. It is obtained from the jute plant and is popularly known as golden fiber on account of the golden sheen that it possesses. On account of its high strength, it is perfect for use in packaging material. Jute is sometimes blended with other fabrics or even used individually in the production of apparel. However, it does not have as good for draping as cotton.

**ANIMALS FIBERS:** The following are some of the popular animals fibers used in the textile industry:

1. Wool:

Wool is a fiber that has traditionally been used in the textile industry, commonly obtained from sheep. Wool fabric is soft to the touch and provides warmth to the weather, due to which it is the preferred choice for winter apparel.

1. Silk:

Silk, again is a natural fiber used in the textile industry since ages. It is obtained from silkworms. The most popular kind of silk is obtained from the mulberry silkworm. The silk that is obtained from other varieties of silkworms is called wild silk. China, India, Nepal and Europe have been traditional producers of good quality silk on a large scale. A silk fiber has a unique sheen. It is very smooth to the touch, at the same time being strong.

**MINERALS FIBERS:**

Mineral fibers include the asbestos group. Asbestos is the only naturally occurring long mineral fiber. Six minerals have been classified as “asbestos” including chrysotile of the serpentine class and those belonging to the amphibole class. Short, fibers-like minerals include wollastonite and attapulgite.

**SYNTHETIC FIBERS:**

Synthetic fibers are man- made fibers that come from chemical resources, rather than of natural origin. Synthetic fibers are continuous filament fibers so that means the fibers come in long lengths and so it doesn’t have to be spun out into yarn.

**HISTORY OF SYNTHETIC FIBERS:**

Synthetic fibers have been under development from the late 19th century. The first artificial fiber, known as artificial silk, became known as viscose around 1894. The synthetic fibers are known as regenerated fibers and were of natural origin, such as cotton or wood pulp, dissolved in a solvent and extruded as a filament and finally rayon in 1924 and it is one of the important early natural based synthetics. A similar product known as cellulose acetate was discovered in 1865. Rayon and acetate are both artificial fibers, but not truly synthetic, being made from wood. Although these artificial fibers were discovered in the mid- nineteenth century, successfully modern manufacturing has been began much later. Nylon, the first synthetic fiber, made its debut in the United States as a replacement for silk.

**COMMON SYNTHETIC FIBERS:**

1. Nylon (1939):

Nylon is a fiber used to imitate silk; it is used in the production of pantyhose. Thicker nylon fibers are used in rope and outdoor clothing.

1. Olefin (1949):

It is a fiber used in linings and warm clothing. Olefins are hydrophobic, allowing them to dry quickly. A sintered felt of olefin fibers is sold under the trade name Tyvek.

1. Acrylic 1950:

It is a fiber used to imitate wools, including cashmere and is often used in replacement of them.

**THREAD AND YARN:**

Yarn:

Yarn is a continuous interlocked thread like structure made of several fibers. It can be used to make fabrics, knit sweaters, crochet, weaving, embroidery and rope making etc. It can even be used to make ropes and to mend fences. For different uses, different yarns are used. For making yarn, several piles are interlinked together in a twisting pattern to make them thick and create a strong yarn. A yarn is obviously much strong and thicker than a single thread. Yarns are made from both natural and synthetic fibers, in filament or staple form. Filament is very long fiber, including the natural fiber silk and the synthetic fibers. Most fibers that occur in nature are fairly short, or staple and synthetic fibers may be cut into short, uniform lengths to form staple. Filament yarns generally require less twist than do staple yarns. More twist produces stronger yarn; low twist produces softer, shiner yarn. Two or more single strands may be twisted together to form ply yarn. Knitting yarns have less twist than weaving yarns.

Thread:

Fine cord of a fibrous material, such as cotton or flax, made of two or more filaments twisted together and used in needle work and the weaving of cloth. Thread is a tightly twisted strand of two or more plys of yarn that are circular when cut in cross section. It is used for hand sewing and in home sewing machines. Ninety-five percent of all sewing thread that is manufactured is used in commercial and industrial sewing.

**YARN COUNTS:**

The yarn count expresses the thickness of the yarn and must be known before calculating the quantity of yarns for a known length of fabric. The yarn count numbers indicates the length of yarn in relation to the weight.

**SPUN YARN:**

It is a number of yarns, twisted up right-handed. The number of yarns varies from two to eight. Spun yarn is made up in pads of 28 and 56 lbs. A textile yarn spun from staple-length fiber. Small rope or stuff formed of two or more rope yarns loosely twisted and used for seizing especially on board ship. First known use of spun yarn was introduced in 14th century.

**SPINNING AND SPINNING WHEEL:**

Spinning:

Spinning is the process of making fibrous material into yarn or thread. Spinning is a major part of textile industry. It is part of the textile manufacturing process where three types of fiber are converted into yarn, then fabric, then textiles. The textiles are then fabricated into clothes or other artifacts. There are three industrial processes available to spin yarn and a handicrafts community who use hand spinning techniques. Spinning is the twisting together of drawn out strands of fibers to form yarn, though it is colloquially used to describe the process of drawing out, inserting the twist and winding onto bobbins.

Spinning Wheel:

A spinning wheel is a device for spinning thread or yarn from natural or synthetic fibers. It is used to spin or twist fibers into a continuous thread or yarn which is later woven into cloth. It’s appeared in Asia, probably in the 11th century. Spinning machinery, such as the spinning jenny and spinning frame, displaced the spinning wheel during the industrial Revolution. The traditional spinning wheel is turned by either a foot pedal (treadle) or by hand. More modern versions of the wheel are turned by power supplied by electricity and water. The thread is twisted as the wheel turns and it is collected or wound on a spindle. There are different types of spinning wheels, including the great wheel for spinning woolen yarn, the flax wheel for spinning linen, the Saxony wheel for worsted yarns and the charkha for fine fibers such as cotton.

**ADVANTAGES AND DISADVANTAGES OF NATURAL FIBERS:**

The advantages and disadvantages of natural fibers are the following:

Advantages:

1. It easier to dye.
2. If clothing made of natural fibers were to catch fire I would just shred whereas synthetic fabric tends to melt.
3. Natural fibers are breathable.
4. Natural fibers are renewable and biodegradable.
5. They are incredibly comfortable for wearing purpose.
6. Lack of skin irritations.

Disadvantages:

1. It absorbs a lot of water.
2. It has low static.
3. Fades faster (color loosing).
4. Some natural fibers are very delicate like silk and are hard to wash/dry etc.
5. To produce natural fiber lots of land is required.
6. Shrinking.

**ADVANTAGES AND DISADVANTAGES OF SYNTHETIC FIBERS:**

The advantages and disadvantages of synthetic fibers are the following:

Advantages:

1. Synthetic fibers are cheap and less expensive.
2. Most synthetic fibers have good elasticity.
3. Most fabrics made of synthetic fibers do not wrinkle easily.
4. Fabrics made of synthetic fibers are generally more durable and more readily available then those made of natural fibers.
5. Most synthetic fibers can handle heavy loads without breaking.

Disadvantages:

1. Despite not be as beautiful as the natural textile.
2. They are not very comfortable.
3. They contain chemicals which may harm our skin.
4. It may not take up dyes.
5. They don’t allow your skin to breath, especially the ones made from polyester fiber.
6. It does not absorb sweat and allow body heat to escape.
7. It catches fire easily.