**Choose the correct option:**

Question 1.
Which of the following is natural fibre?
(a) Rayon
(b) Nylon
(c) Polyester
**(d) Cotton**

Question 2.
Which of the following is synthetic fibre?
**(a) Nylon**
(b) Cotton
(c) Silk
(d) Wool

Question 3.
The basic component of plant fibres is
(a) protein
**(b) cellulose**
(c) starch
(d) none of these

Question 4.
Raw materials for preparation of synthetic fibres are obtained from
(a) coal
(b) petroleum
(c) natural gas
**(d) all of these**

Question 5.
Which of the following is known as artificial silk?
(a) Nylon
**(b) Rayon**
(c) Polyester
(d) Silk

Question 6.
In which year was nylon made?
**(a) 1931**
(b) 1964
(c) 1948
(d) 1950

Question 7.
Which fibre is used as artificial wool?
**(a) Acrylic**
(b) Rayon
(c) Nylon
(d) Cotton

Question 8.
Which of the following fibre has highest tensile strength?
(a) Cotton
(b) Silk
(c) Rayon
**(d) Nylon**

Question 9.
Common variety of polyester is
**(a) terylene**
(b) polymer
(c) viscose
(d) spinneret

Question 10.
Polymers are made up of small units called
(a) layers
(b) molecules
(c) cells
**(d) monomers**

Question 11.
Which of the following polyester is made by blending polyester and cotton?
(a) Terrywool
**(b) Terrycot**
(c) Terrysilk
(d) PET

Question 12.
Wood pulp is used to make
(a) plastic
(b) wool
(c) jute
**(d) rayon**

Question 13.
The property of materials by which they can be moulded into any shape is

called
(a) conductivity
(b) elasticity
**(c) plasticity**
(d) none of these

Question 14.
Which of the following is a thermoplastic?
(a) Bakelite
(b) Melamine
**(c) PVC**
(d) All of these

Question 15.
Which of the following are made from thermosetting plastic?
(a) Bottles
**(b) Crockery**
(c) Shoes
(d) Handbags

Question 16.
Polycarbonate is used to make
**(a) compact discs**
(b) straws
(c) bottles
(d) jars

Question 17.
Synthetic fibres are
(a) durable
(b) wrinkle free
(c) economical
**(d) all of these**

Question 18.
Plastics that retain their plasticity on repeated heating are called
(a) thermosetting plastics
**(b) thermoplastics**
(c) thermal plastics
(d) none of these

Question 19.
Which of the following is a characteristic of plastics?
(a) Electrical conductors

(b) Heat conductors
(c) Biodegradable
**(d) Non-biodegradable**

Question 20.
Plastic that can resist fire is
(a) bakelite
**(b) melamine**
(c) PVC
(d) duroplast

Question 21.
Polywool is a mixture of which substances?
**(a) Polyester + wool**
(b) Polythene + wool
(c) Polycarbonate + wool
(d) Polyester + wool + cotton

Question 22.
Plastic bags are generally made from which plastic?
(a) PET
**(b) Polythene**
(c) Bakelite
(d) Melamine

Question 23.
Which material is used for making bottles and jars?
**(a) PET**
(b) Polythene
(c) Bakelite
(d) Melamine

Question 24.
The raw materials used in making nylon are
(a) wood pulp
(b) cellulose
**(c) coal, water and air**
(d) all of these

Question 25.
The purest natural form of cellulose is
(a) rayon
**(b) cotton**

(c) wool
(d) silk

Question 29.
The first fully synthetic plastic was
**(a) bakelite**
(b) melamine
(c) teflon
(d) polythene

Question 30.
The non-stick coating on pans and other cooking utensils is made from
(a) rayon
**(b) teflon**
(c) melamine
(d) pvc

Question 31.
Which of the following is not a part of 5R's formula?
(a) Reduce
(b) Recycle
(c) Recover
**(d) Reinvent**

Question 32.
Synthetic plastics lead to
(a) water pollution
(b) air pollution
(c) solid waste pollution
**(d) all the above**

Question 33.
The polymers in which smaller units are linked to each other in straight arrangement are called
(a) cross-linked polymers
**(b) linear polymers**
(c) branched polymers
(d) none of the above

Question 34.
A plastic which can be softened on heating and moulded repeatedly is called
**(a) thermoplastic**
(b) thermosetting plastic

(c) thermolabile plastic
(d) both (b) and (c)

Question 35.
The synthetic plastic used for making insulation cover in electrical wires/cables is
(a) bakelite
(b) melamine
**(c) polyvinylchloride**
(d)polystyrene

**INTRODUCTION**

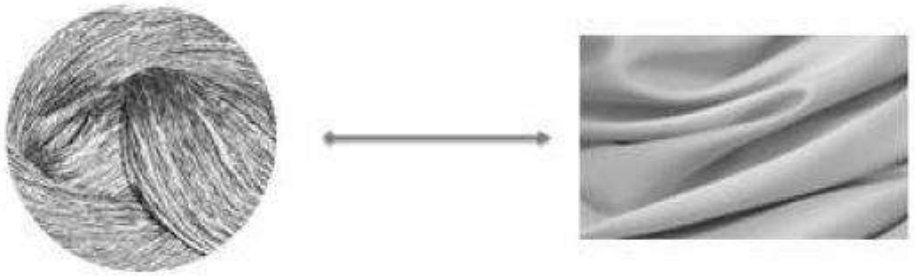
The clothes which we wear are made of **fabrics**.
Fabrics are made from fibres obtained from natural or artificial sources.
*Can you name some natural fibres?*
Fibres are also used for making a large variety of household articles. You have read in your previous classes that natural fibres like cotton, wool, silk, etc., are obtained from plants or animals. The synthetic fibres, on the other hand, are made by human beings.
That is why these are called **synthetic** or **man-made fibres.**

**SYNTHETIC FIBRES**

**Synthesis** means **to make** and **synthetic** means **man-made**.
So, man made fibres are called synthetic fibres. A synthetic fibre is also a chain of small units joined together. Each small unit is actually a chemical substance. Many such small units combine to form a large single unit called a **polymer**.
The word *polymer* comes from two
Greekwords; *poly* meaning *many* and *mer* meaning *part/unit*. So, a polymer is made of many repeating units.

**A) Rayon**

We have learnt that silk fibre obtained from silkworm was discovered in China and was kept as a closely guarded secret for a long time. Fabric obtained from silk fibre was very costly. But its beautiful texture fascinated everybody. Attempts were made to make silk artificially. Towards the end of the nineteenth century, scientists were successful in obtaining a fibre having properties similar to that of silk.
Fibre obtained by chemically treating wood pulp is called rayon or artificial silk.



Although rayon is obtained from a natural source, wood pulp, yet it is a **man-made fibre.**

**Characteristics of rayon**

• Cheaper than silk and can be woven like silk fibres.
• Highly absorbent, soft and comfortable.
• Easy to dye in a wide range of colours, and drapes well.

**Uses of rayon**

• Widely used in all types of clothing and home furnishings.
• Mixed with cotton to make bed sheets and curtains, or with wool to make carpets.

**B) Nylon**

Nylon is another man-made fibre. In 1931, it was made without using any natural raw material (from plant or animal). It was prepared from coal, water and air. It was the first fully synthetic fibre. Nylon is a synthetic fibre made from coal, water and air.

***Characteristics of nylon***

Nylon is Strong, Elastic , Light, Lustrous , Easy to wash. So, it became very popular for making clothes.

***Uses of nylon***

We use Nylon to make Socks, Ropes, Tents, Toothbrushes, Car seat belts, Sleeping bags, Curtains, etc.

***Point to note***

Is nylon fibre really so strong that we can make nylon parachutes and ropes for rock climbing ?

Nylon is also used for making **parachutes** and **ropes** for rock climbing.

A nylon thread is actually stronger than a steel wire.

**C) Polyester**

Polyester is a synthetic fibre, derived from **coal, air, water** and petroleum. Polyester is

made of repeating chemical units called esters.
Fabric made from polyester retains its shape and remains crisp. Polyester is easy to wash and dry.
**Polycot** is a mixture of polyester and cotton. **Polywool** is a mixture of polyester and wool. Terylene is a popular form of polyester, which can be drawn into very fine fibres. These fibres can be woven like any other yarn.
**PET, or Poly-ethylene terephthalate,** is another familiar form of polyester, which is used to make bottles, utensils, films and wires.
Polyester is also used for making hoses, ropes, nets, thread, raincoats, fleece jackets, clothing and medical textiles.






**D) Acryclic**
We wear sweaters and use shawls or blankets in the winter. Do you know the material with which they are made of ? Many of these are actually not made from natural wool, though they appear to resemble wool. These are prepared from another type of synthetic fibre called **acrylic**.
***Acrylic is a synthetic polymer of methyl methacrylate.***
Fabric made from acrylic is **warm to wear,** retains its shape and is durable. Acrylic is **easy to wash** and **dries quickly.** Acrylic is used in apparel like sweaters and socks, and in home furnishings such as furniture, carpets, blankets and upholstery fabrics. Industrial uses of acrylic include craft yarns, awnings, boat and vehicle covers, and luggage.

**Point Of Safety**
Synthetic fibres are more durable and affordable which makes them more popular than natural fibres. But they too have demerits. Synthetic fibres melt on heating. If the clothes catch fire, it can be disastrous. The fabric melts and sticks to the body of the person

wearing it. We should, therefore, not wear synthetic clothes while working in in the kitchen or in a laboratory.

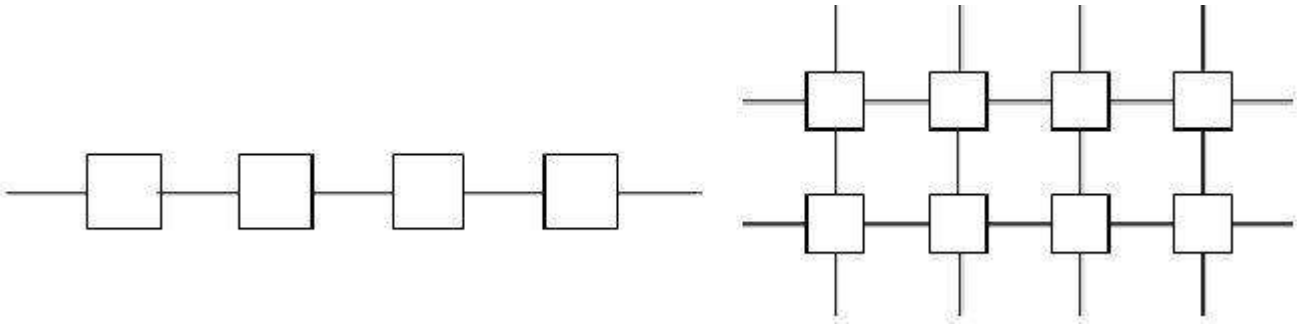
**PLASTICS**

You must be familiar with many articles used in our daily life like bottles, mugs, polythene bags, plastic chairs, clips, handles of kitchen wares, doctor's gloves etc.

*Have you ever thought with what material all these are made ?*

All these are made of Plastics. Plastic is also a polymer like the synthetic fibre. All plastics do not have the same type of arrangement of units.

In some, the units are arranged in linearly as shown. Whereas in others, they are cross linked as shown.



**Types of Plastics**

Plastics can be broadly classified into two categories, depending on their interaction with heat.

**A) Thermoplastics**

Plastics which gets deformed easily on heating and can be bent easily are known as **thermoplastics.**

**Polythene and PVC** are some of the examples of thermoplastics. These are used for manufacturing toys, combs and various types of containers.

**B) Thermosetting Plastics**

Plastics which when moulded once, can not be softened by heating called **thermosetting plastics. Bakelite** and **melamine** are the examples. Bakelite is a poor conductor of heat and electricity.

It is used for making electrical switches, handles of various utensils, etc. Melamine is a versatile material. It resists fire and can tolerate heat better than other plastics. It is used for making floor tiles, kitchenware and fabrics which resist fire.

**Characteristic properties of Plastics**

***A) Plastic is non-reactive***

You know that metals like iron get rusted when left exposed to moisture and air. But plastics do not react with water and air. They are not corroded easily. That is why they are used to store various kinds of material, including many chemicals.

***B) Plastic is light, strong and durable***

As plastic is very light, strong, durable and can be moulded into different shapes and sizes, it is used for various purposes. Plastics are generally cheaper than metals. They are widely used in industry and for household articles.

***C) Plastics are poor conductors***

Plastics are poor conductors of heat and electricity. That is why electrical wires have plastic covering, and handles of screw drivers are made of plastic. As mentioned earlier,

handles of frying pans are also made of plastic.

**Do you Know?**

• Plastics find extensive use in the health-care industry. Some examples of their use are the packaging of tablets, threads used for stitching wounds, syringes, doctors' gloves and a number of medical instruments.

• Special plastic cookware is used in microwave ovens for cooking food. In microwave ovens, the heat cooks the food but does not affect the plastic vessel.

• **Teflon** is a special plastic on which oil and water do not stick. It is used for nonstick coating on cookwares.

• Fire-proof plastics : Although synthetic fibre catches fire easily, it is interesting to know that the uniforms of firemen have coating of **melamine plastic** to make them flame resistant.

**Plastics and the Environment**

***Disposal of plastic is a major problem. Why ?***

A material which gets decomposed through natural processes, such as action by bacteria, is called **biodegradable**. A material which is not easily decomposed by natural processes is termed as **non-biodegradable**.

**Environmental Pollution By Plastics**

Since plastic takes several years to decompose, it is not environment friendly. It causes environmental pollution. Besides, the burning process in the synthetic material is quite slow and it does not get completely burnt easily. In the process, it releases lots of poisonous fumes into the atmosphere causing air pollution.

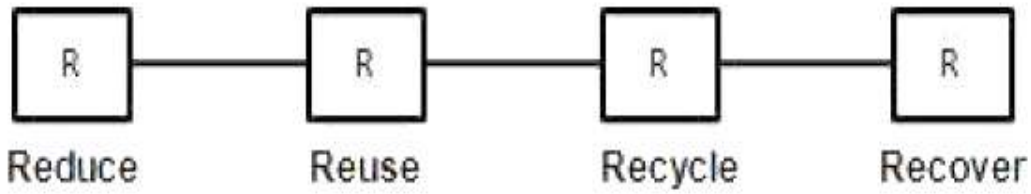
***Solving the problem***

Avoid the use of plastics as far as possible. Make use of bags made of cotton or jute when you go for shopping. The biodegradable and non-biodegradable wastes should be collected separately and disposed off separately. It is better to recycle the plastic waste. Most of the thermoplastics can be recycled.

However, during recycling certain colouring agents are added.

This limits its usage especially for storage of food.

As a responsible citizen remember the 4R principle.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Reduce
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Recover