

**PARAGON CONVENT SCHOOL**

**SECTOR: 24 B, CHANDIGARH**

**LESSON - 3**

**SYNTHETIC FIBRES AND PLASTICS**

**Summary:**

- Polymers are large compounds made by the repetition of smaller units called monomers.
- Synthetic fibres are human made polymers, used to make fabrics.
- Rayon is a semi synthetic polymer, made from wood pulp. It is also called artificial silk.
- Nylon and polyester are synthetic fibres used to make clothes, ropes and other stuff.
- Acrylic is a synthetic fibre similar to wool.
- Synthetic fibres are lighter, stronger and much more lasting than natural fibres.
- Plastics are polymers made mainly from petrochemicals.
- Plastic are used to make variety of objects as a substitute to metal and glass.
- Thermoplastics soften on heating and can be remoulded, e.g. : polythene.
- Thermosetting plastic do not soften on heating and cannot be remoulded, e.g. : bakelite.
- Plastics are non biodegradable and are causing severe pollution in the world.

**Multiple Choice Questions (Page No. 44)**

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

**Multiple Choice Questions (Page No. 49)**

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

## **SECTION A**

### **CLASS RESPONSE**

#### **Oral questions:**

**Q1.-** Name any three a) natural fibres b) synthetic fibres.

**Ans.-** (a) Jute, cotton, silk, wool .

(b) Terylene, rayon, nylon, polyester.

**Q2.-** Name any two polyester fibres.

**Ans.-** Terylene, dacron, tereph

**Q3.-** What type of plastic cannot be processed again and again?

**Ans.-** Thermosetting plastics.

#### **Science quiz:**

**Q1.-** Name the process by which artificial fibres are made.

**Ans.-** Polymerisation

**Q2.-** Name the fibre prepared by using wood pulp.

**Ans.-** Rayon.

**Q3.-** Name the plastic which is used in making electrical switches.

**Ans.-** Bakelite

### **WORKSHEET**

#### **Tick (✓) the correct options:**

1. (b)

2. (b)

3. (c)

4. (c)

#### **Circle the odd ones. Give reasons for your choice:**

1. Cotton

Jute

Nylon

Linen

**Ans.-** Nylon → It is a synthetic fibre, whereas others are natural fibres.

2. Bakelite                  Melamine                  Formica                  PVC

**Ans.-** PVC → It is a thermoplastic, whereas others are thermosetting plastics.

**Fill in the blanks:**

1. amide                  2. drip-dry property                  3. soft                  4. water pollution

**SECTION B**

**Multiple Choice Questions**

1. (d)                  2. (b)                  3. (d)

**Very Short Answer Questions:**

**Q1.-** Which fibre is also called artificial silk?

**Ans.-** Rayon.

**Q2.-** Name the monomer of nylon.

**Ans.-** Amide molecule.

**Q3.-** Give any two examples of thermoplastics.

**Ans.-** Polythene and PVC.

**Q4.-** Give any two examples to show that plastics are non-corrosive in nature.

**Ans.-** Raincoats, PVC pipes, soles of shoes, sandals and handbags.

**Q5.-** Name the monomer of the following polymers : a) cellulose b) nylon.

**Ans.-** (a) Glucose                  (b) Amide.

**Short Answer Type-I Questions:**

**Q1.-** What are human made or synthetic fibres?

**Ans.-** Fibres obtained through different chemical processes in the industries are human-made or synthetic fibres.

**Q2.-** What is plastic? Give any two uses of plastic.

**Ans.-** Plastics are polymers made up of a very large number of small molecules joined end to end to form long chains. These are synthetic materials which on being heated become soft and can be moulded into desired shapes and then again hardened to provide durable articles.

(i) Plastics (PVC) are used for making water pipes, bathroom curtains, raincoats.

(ii) Plastics (bakelite) are used for making electrical switches and plugs, insulated wires.

**Q3.-** Why is nylon used for making bristles of toothbrushes?

**Ans.-** Due to high tensile strength of the nylon fibres, these are used for making bristles of toothbrushes.

**Q4.-** John goes for mountaineering with some selected students of his batch. Initially, he is scared of it. His trainer tells him that he should be strong. He provides him a strong rope and teaches him how to climb a mountain.

a) Name the fibre which is used in making the climbing rope.

b) What can we learn from John and his trainer?

**Ans.-** (a) Nylon.

(b) We learn that we can do anything by having strong will power and determination. We should not be scared of anything and should make constant efforts to achieve our goal. We should always help others in overcoming their fears.

**Short Answer Type-II Questions:**

**Q1.-** Write any two uses of plastics.

**Ans.-** (i) Plastics (PVC) are used for making water pipes, bathroom curtains, raincoats.

(ii) Plastics (bakelite) are used for making electrical switches and plugs, insulated wires.

**Q2.-** What is 5-R principle?

**Ans.-** Refuse, Reduce, Reuse, Recycle and Recover is called the 5-R principle. It helps to reduce pollution and keep the environment clean.

**Q3.-** Write the differences between thermosetting plastics and thermoplastics.

**Ans.-**

Thermoplastic	Thermosetting plastic
1. A plastic which can be melted repeatedly by heating, hardened on cooling and can be moulded again and again into different shapes.	1. A plastic which once moulded into a particular shape does not become soft on heating and cannot be moulded a second time
2. They become soft on heating.	2. They do not become soft on heating.
3. They are less tough as compared to thermosetting plastics.	3. They are more tough and rigid.
4. They are less resistant to high temperatures.	4. They are more resistant to high temperatures.
5. They can be recycled.	5. They cannot be recycled.
6. Examples: Polythene, PVC	6. Examples: Bakelite, melamine, formica.

**Q4.-** Why do we wear cotton clothes in summers?

**Ans.-** We wear cotton clothes in summers because cotton absorbs sweat released by the sweat glands in body in hot and humid weather and makes us feel comfortable.

**Q5.-** Why are saucepan handles, electric plugs and switches made of thermosetting plastics?

**Ans.-** Saucepan handles, electric plugs and switches are made of thermosetting plastics because they are more tough and rigid and are poor conductors of heat and electricity.

**Long Answer Questions:**

**Q1.-** Write any five advantages of synthetic fibres over natural fibres.

**Ans.-** (a) High tensile strength: Synthetic fibres are very strong and can hold large weight without breaking.

(b) Low water absorption: Synthetic fibres absorb very little amount of water. So, they dry quickly and this property is called drip-dry property.

(c) Abrasion-resistant: Most of the synthetic fibres have wear and tear resistance. So, the clothes made by these fibres are long lasting or durable.

(d) Less expensive: Synthetic fibres are less expensive and more affordable.

(e) Lightweight: Most synthetic fibres are quite lightweight. Natural fibres are comparatively heavy.

**Q2.-** Write any five environmental hazards of plastics.

**Ans.-** (i) Plastics do not get completely burnt and produce toxic gases that cause air pollution.

(ii) When plastics are dumped in water, they cause water pollution.

(iii) Most of the plastics dumped in landfills, pollute land.

(iv) Polybags, carelessly thrown here and there, choke the drains and the sewer lines.

(v) Plastic is dangerous for animals especially cows, the plastic materials choke the respiratory system or the digestive system, this can lead to their death.

**Q3.-** Give reasons for the following:

- a) Cooking pans have plastic handles
- b) Burning of plastic causes air pollution.
- c) Nylon is used for making climbing ropes.
- d) Refrigerator have a plastic foam core.
- e) Electric wires have a plastic covering.
- f) Bakelite is used for making electric switches.

**Ans.-** (a) Cooking pans have plastic handles because plastic is a poor conductor of heat.

(b) Burning of plastics produces toxic gases and smoke which cause air pollution.

(c) Nylon is used for making climbing ropes because nylon has a high tensile strength.

(d) Refrigerators have a plastic foam core because plastic is a poor conductor of heat.

(e) Electric wires have a plastic covering because plastic is a poor conductor of electricity.

(f) Bakelite is used for making electrical switches because bakelite is poor conductor of electricity.