17. Man-made Materials

Practice Questions

Q 1) Write the answers of the following questions.

1. How was glass discovered ?

Ans: Glass was discovered by chance. Some Phoenician traders were cooking in desert. The cooking vessels were supported on lime-stones. When the cooking vessel was kept off the lime-stone, they observed that a transparent material has been formed. They thought that this transparent material may had been formed due to heating together of sand and lime-stone. This led to the development of technique of glass production.

2. How is the borosilicate glass formed? Write its uses.

Ans: Borosilicate glass is produced by melting the mixture of sand, soda, boric acid and aluminium oxide. This glass does not show any effect on medicines. Hence, the bottles made up of borosilicate glass are used in pharmaceutical industry to store the medicines.

3. State the types of the thermoplastic and write its uses.

Ans: Types of the thermoplastic are as follows –

1. Polyvinyl chloride (PVC) 2. Polystyrene (PS)

3. Polyethylene (PE) 4. Polypropylene (PP)

Uses: -

1. Polyvinyl chloride (PVC): Bottles, raincoat, pipes, handbags, shoes, electric cable insulation, furniture, ropes, toys, etc.

2. Polystyrene (PS): Thermo-insulating parts of electric appliances like refrigerators, gears of machine, toys, protective covering like covers of CD and DVD, etc.

3. Polyethylene (PE): Milk bags, packing bags, flexible garden pipes, etc.

4. Polypropylene (PP): Parts of loudspeakers and vehicles, ropes, mattresses, laboratory appliances, etc.

4. How can we save the environment from pollution?

Ans: Each responsible citizen should follow the 4R principle, i.e.

Reduce – Minimal use,

Reuse – Use again,

Recycle – Use again after processing

Recover – Reclaiming. Thus, we can save the environment from pollution.

Q 2) Write short notes on-

1. Plastic

Ans: A manmade material showing the property of plasticity and made up of organic polymers is plastic. Structure of all plastics is not same. Some are linear while some are circular. Depending upon the effect of heat, plastic can be classified into two types. The plastic that can be moulded as per our wish is called as thermoplastic. Example: Polythene, PVC are used for manufacturing the toys, combs, plates, bowls, etc. Another type of plastic is such that once a specific shape is given with the help of mould, its shape cannot be changed on heating. It is called as thermosetting plastic. E.g. electric switches, coverings over the handles of cookers, etc.

2. Thermocol

Ans: When a new, easily breakable item is bought at your home, it is usually packed in a box. So as to prevent that item from breaking while handling the box, it is always packed in one more wrapping, that wrapping is of thermocol. Now a days, the plates used in mass feasts are also made up of thermocol. Thermocol is a form of a complex material called polystyrene. It transforms in to liquid state on heating at more than 100^{0}C temperature and returns to solid state on cooling. Hence, we can give any desired shape to it. Being a good shock-absorber, it is used in packing of delicate items.

Q 3) Write the scientific reasons.

1. Silica glass is used to produce laboratory glass-wares.

Ans: Items made up of silica glass show minimum expansion on heating. It is not affected by acid and alkali. Hence, silica glass is used to produce laboratory glass-wares.

2. Alkali silicate glass is called as water glass.

Ans: Alkali silicate glass is produced by heating the mixture of sand and soda. As this glass is soluble in water, it called as water glass.

3. The excessive use of thermocol is dangerous for human beings.

Ans: Thermocol contains the styrene. As carcinogenic ingredients are present in styrene, the person in contact with thermocol for long duration may have the possibility of blood cancer like leukaemia and lymphoma. Such people may suffer from eye problems, respiratory system, skin, digestive system, etc. Pregnant women may suffer miscarriage. Liquid styrene may cause skin-burns.

Q 4) Which ingredients are mixed in the glass to get different colours?

Ans: Cadmium sulphate or iron oxide is mixed to get yellow colour while cupric salt and cobalt oxide is mixed to get blue or dark blue colour of glass. Similarly, selenium oxide and cadmium sulphate and cupric oxide are mixed to get orange and dark red colour. Manganese dioxide and sodium chromate are mixed to get purple and green colour.

Q 5) Identify the different term.

1. Plastic, Glass, Thermocol, Sand

Ans: Sand (this is natural made material and others are man-made materials.)

2. Polyurethane, Polyester, Bakelite, Polystyrene

Ans: Polystyrene (this the type of thermoplastic and others are the types of thermosetting.

Q 6) Identify the correlation.

1. Ropes: _____: : Milk bags: Polyethylene

Ans: Polypropylene

2. _____: Polyurethane: : Fibre glass: Polyester

Ans: Seats in vehicles

Q 7) Write whether the following statements are true or false.

1. Plastic does not corrode.

Ans: True

2. Burning of thermocol releases poisonous gases in atmosphere.

Ans: True

3. Polyethylene plastic is used for manufacturing artificial teeth.

Ans: False (Polyacrylic plastic is used for manufacturing artificial teeth.)

4. Glass is the non-crystalline solid material formed from mixture of silica and silicate.

Ans: True

5. Layered glass is the type of optical glass.

Ans: False (Layered glass is the type of Processed glass.)

Q 8) Write the definition.

1. Degradable materials.

Ans: Some materials are naturally degraded, they are called as degradable materials.

2. Non-degradable materials.

Ans: Some materials are not naturally degraded, they are called as non-degradable materials.

3. Natural materials.

Ans: Naturally available materials are called natural materials.

4. Man-made materials.

Ans: Human beings performed research on various natural materials and manufactured new materials. There materials are called as man-made materials.

5. Thermoplastic plastic

Ans: The plastic that can be moulded as per our wish is called thermoplastic.

6. Thermosetting plastic

Ans: Once a specific shape is given with the help of mould, its shape cannot be changed on heating. Such plastic is called as thermosetting plastic.

Q 9) Write the answers in one sentence.

1. Why glass is used in electric appliances?

Ans: Glass is a bad conductor of electricity hence glass is used as insulator in electric appliances.

2. How much is the degradation period of cotton cloth?

Ans: The degradation period of cotton cloth is 1 year.

3. What are the vessels used to cook food in microwave oven made of?

Ans: The vessels used to cook food in microwave oven are made up of plastic.

4. What are domestically useful items and some spare parts of airplane engines are made of?

Ans: Domestically useful items and some spare parts of airplane engines are made from Melamine thermosetting plastic.

5. What risk will be createdif the food kept in thermocol is reheated?

Ans: If the food kept in thermocol is reheated, styrene may dissolve in that food. Hence, there is possibility of health problems.

****