Synthetic Fibers and Plastics

Very Short Answer Type Questions

Q.1. Name the units of which cellulose polymer is made.

Answer: Cellulose polymer is made from the repeat units of the monomer glucose.

Q.2. Name the man-made fibre prepared from natural materials.

Answer: Rayon is the man-made fibre prepared from the natural materials.

Q.3. Name the man-made fibre which is regarded as artificial silk.

Answer: Rayon is the man-made fibre which is regarded as artificial silk.

Q.4. Name the fibre obtained by the chemical treatment of wood pulp (or cellulose).

Answer: Rayon is obtained by the chemical treatment of wood pulp or cellulose.

Q.5. Name the first fully synthetic fibre.

Answer. Nylon is the first fully synthetic fibre. It was prepared from coal, water and air.

Q.6. Name the fibre used for making parachutes and rock-climbing ropes.

Answer: Nylon is used for making parachutes and rock-climbing ropes.

Q.7. Which synthetic fibre contains the organic group similar-to those which give fruits their sweet smell.

Answer: Polyester is the synthetic fibre which contains the organic group similar-to those which give fruits their sweet smell.

Q.8. Which synthetic fibre feels like wool and used as a substitute for wool?

Answer: Acrylic is the synthetic fibre feels like wool and used as a substitute for wool.

Q.9. To which kind of synthetic fibers does terylene belong?

Answer: Terylene is a kind of a polyester.

Q.10. State one disadvantage of using synthetic fibers for making clothes.

Answer: Synthetic fibers are different from the natural fibers. They melt on heating. If the clothes made of synthetic fibers catch fire, it can be very dangerous. The fabric will melt and can stick to the body of the person wearing it. Hence, we should not wear synthetic clothes while working in a kitchen or working in a laboratory.

Q.11. Name the form of polyester which is replacing materials like glass and used for making bottles and jars.

Answer: PET is a very familiar form of polyester. It is used for making bottles and utensils which is replacing materials like glass.

Q.12. Name four different plastics.

Answer: Polythene, PVC- Poly vinyl chloride, bakelite and melamine are the examples of different plastics.

Q.13. Give one use of Teflon.

Answer: Teflon is used for nonstick coating on cookware. It is a special plastic on which oil and water do not stick.

Q.14. Which of the two is a thermosetting plastic: PVC or bakelite?

Answer: The plastics which cannot be softened by heating, when moulded once are called thermosetting plastics. Bakelite is a thermosetting plastic.

Q.15. Fill in the following blanks with suitable words:

(a) Synthetic fibers are also called.....or……fibers.

(b) Synthetic fibers are made from raw materials called.....

(c) Like synthetic fibers, plastic is also a .....

(d) The use of plastics can be reduced by using bags made of .....or .....instead of polythene bags.

Answer: (a) man-made or artificial, Rayon and nylon are the examples of synthetic fibers.

(b) petrochemicals, Nylon was the first fully synthetic fiber. It was petrochemicals which is derived from fossil fuels

(c) polymer, the arrangement of units in a plastic can be linear or cross-linked.

(d) paper or jute bag Disposal of plastic is a major problem. This is can be reduced by use paper or jute bag.

Short Answer Type Questions

Q.16. What is a polymer? Name the natural polymer from which cotton is made.

Answer: A synthetic fibre is made of small units which are joined together. These units are made of chemical substances. Such small units combine to form a large single unit called a polymer. Hence, a polymer is made of many repeating units. Polymers also

occur in nature. For example, cotton is a natural polymer which is made from the cellulose. Cellulose is made up of a large number of glucose units.

Q.17. State the characteristics of synthetic fibers.

Answer: A synthetic fibre is made of small units which are joined together. These units are made of chemical substances. Such small units combine to form a large single unit called a polymer. Hence, a polymer is made of many repeating units. Following are the characteristics of synthetic fibers:

● Synthetic fibers absorb very less water and they dry up quickly.

● They are durable and are less expensive.

● They are readily available and are easy to maintain.

● Due to such unique properties, synthetic fibers are used to make dress materials.

Q.18. What is nylon? State the important properties of nylon.

Answer: Nylon is the first fully synthetic fibre. It was made in 1931, without the use of any natural raw material from plants or animals. It was prepared from coal, water and air. Following are the properties of nylon:

● Nylon has the ability to show variation of luster. It has the ability to be very lustrous, semi lustrous or dull.

● It is highly durable and is used for making seatbelts and tire cords.

● Nylon fibre is very strong, elastic and light. It is lustrous and easy to wash. Hence, it became very popular for making clothes.

● A nylon thread is actually very strong than steel wire. It is also used for making parachutes and ropes for rock climbing.

● It is also used for making articles such as socks, ropes, tents, toothbrushes, car seat belts, sleeping bags and curtains.

Q.19. Give the important uses of nylon.

Answer: Nylon is the first fully synthetic fibre. Nylon is the first fully synthetic fibre. Following are the uses of nylon:

● It is highly durable and is used for making seatbelts and tire cords.

● Nylon fibers is very strong, elastic and light. It is lustrous and easy to wash. Hence, it became very popular for making clothes.

● A nylon thread is actually very strong than steel wire. It is also used for making parachutes and ropes for rock climbing.

● It is also used for making articles such as socks, ropes, tents, toothbrushes, car seat belts, sleeping bags and curtains.

Q.20. What is polyester? Name a popular polyester.

Answer: Polyester is the synthetic fibre which is made up of repeating units of a chemical called an ester. Esters are the chemicals which give fruits their smell. Polycot, poly wool and terry cot are popular polyesters. These are made by mixing two types of fibers. For example, polycot is a mixture of polyester and cotton. Poly wool is a mixture of polyester and wool. Fabrics made from polyester does not get wrinkled easily. It remains crisp and easy to wash. Hence, it is suitable for making dress material.

Q.21. Arrange the following fibers in the order of increasing strength (keeping the fibre of least strength first): Nylon, Cotton, Wool, Polyester, Silk

Answer: Some fibers are stronger than the others. The fibers are arranged in terms of strength in the following way: Wool, Cotton, Polyester, Nylon, Silk.

Silk is the strongest fibre whereas wool is the weakest in terms of strength.

Q.22. What is PET? State the uses of PET.

Answer: PET is a form of polyester. Polyester is the synthetic fibre which is made up of repeating units of a chemical called an ester. Esters are the chemicals which give fruits their smell. PET is used for making bottles, utensils, films and wires.

Q. 23. What is acrylic? State one important property of acrylic.

Answer: Acrylic is a synthetic fibre which appears to resemble wool. It is flexible, resistant to moth, oil and chemicals. The clothes made from acrylic are relatively cheap and are available in a variety of colours.

Q.24. Write the uses of acrylic fibers.

Answer: Acrylic is a synthetic fibre which appears to resemble wool. It is flexible, resistant to moth, oil and chemicals. It is used in the following ways:

● It is used for making sweaters and tracksuits and also for the linings of boots and gloves.

● It is also used in making furnishing fabrics and carpets.

● It can also be used to make fur and many different knitted clothes.

Q.25. Why should we not wear clothes made of synthetic fibers (like nylon or polyester) while working in the kitchen?

Answer: Synthetic fibers such as nylon or polyester are different from the natural fibers. They melt on heating. If the clothes made of synthetic fibers catch fire, it can be very

dangerous. The fabric will melt and can stick to the body of the person wearing it. Hence, we should not wear synthetic clothes while working in a kitchen or working in a laboratory.

Q.26. What type of shirts should we buy for summer: cotton shirts or shirts made from synthetic materials (like polyester)? Give reason for your answer.

Answer: We should buy cotton shirts to wear in summers. This is because cotton absorbs sweat from our body and allows it to evaporate into the air. It also discourages the growth of bacteria and does not cause any skin allergies.

Q.27. Explain how, manufacturing of synthetic fibers is actually helping in the conservation of forests.

Answer: The raw materials for natural fibers are mainly derived from plants and animals. It requires the cutting of a lot of trees which leads to deforestation. On the other hand, the raw materials for synthetic fibers are mainly petrochemicals such as coal. Hence, the manufacturing of synthetic fibers helps in the conservation of forests.

Q.28. What are plastics? Name any five commonly used articles made of plastics.

Answer: Plastic is a polymer like a synthetic fibre. The arrangement of units in a plastic can be linear or cross-linked. Plastic articles are available in all possible shapes and sizes. It can be easily moldable and can be shaped in any form. It can be recycled, reused, coloured, melted and can be rolled into sheets or made into wires. Plastic is used to manufacture toys, combs, containers, utensils and electrical switches.

Q.29. What are the various types of plastics? Give two examples of each type of plastics.

Answer: Plastic is a polymer like a synthetic fibre. The arrangement of units in a plastic can be linear or cross-linked. Based on the arrangement of monomers, plastics are of the following types:

● **Thermoplastics**: The plastics which gets deformed easily on heating and can be bent easily are called thermoplastics. For example, polythene and PVC are thermoplastics. These are used in the manufacturing of toys, combs and different types of containers.

● **Thermosetting plastics:** The plastics which when molded once, cannot be softened by heating are called thermosetting plastics. For example, Bakelite is a thermosetting plastic which is a poor conductor of heat and electricity. It is used to make electrical switches and handles of utensils. Melamine is a thermosetting plastic which is resistant to fire and can tolerate heat better than other plastics. It is used to make floor tiles, kitchenware and fire-resistant fabrics.

Q.30. Why are thermoplastics not used for making frying pan handles?

Answer: Thermoplastics gets deformed easily on heating and can also be bent easily. As a result, they are not used for making frying pan handles. Frying pan handles are

made with thermosetting plastics which are resistant to fire and can tolerate heat better than other plastics.

Q.31. Explain why, frying pan handles are made of thermosetting plastics.

Answer: Frying pan handles are made with thermosetting plastics which are resistant to fire and can tolerate heat better than other plastics. For example, Bakelite is a thermosetting plastic which is a poor conductor of heat and electricity.

Q.32. Why are electric witches, plugs and sockets made of thermosetting plastics?

Answer: The plastics which when molded once, cannot be softened by heating are called thermosetting plastics. For example, Bakelite is a thermosetting plastic which is a poor conductor of heat and electricity. It is used to make electrical switches and handles of utensils. Melamine is a thermosetting plastic which is resistant to fire and can tolerate heat better than other plastics. Hence, electric witches, plugs and sockets made of thermosetting plastics.

Q.33. Explain the difference between thermoplastics and thermosetting plastics.

Answer: Thermoplastics: The plastics which gets deformed easily on heating and can be bent easily are called thermoplastics. For example, polythene and PVC are thermoplastics. These are used in the manufacturing of toys, combs and different types of containers.

Thermosetting plastics: The plastics which when molded once, cannot be softened by heating are called thermosetting plastics. For example, Bakelite is a thermosetting plastic which is a poor conductor of heat and electricity. It is used to make electrical switches and handles of utensils. Melamine is a thermosetting plastic which is resistant to fire and can tolerate heat better than other plastics. It is used to make floor tiles, kitchenware and fire-resistant fabrics.

Q.34. Should the handle and bristles of a toothbrush be made of the same type of plastic material? Explain your answer.

Answer: The handle and bristles of a toothbrush should be made of different type of plastic material. The handle of toothbrush should be hard and strong whereas the bristles should be soft and flexible.

Thus, the handle is made of plastic while the bristles are made of nylon.

Q.35.Explain why, plastic containers are preferred for storing food.

Answer: Plastic is a polymer like a synthetic fibre. The arrangement of units in a plastic can be linear or cross-linked. Plastic containers are preferred for storing food because of the following reasons:

● Plastic is non-reactive. It does not react with water and air. It is therefore, safe to keep food in plastic containers.

● Plastic is light, strong and durable and can be molded into different shapes and sizes. It is cheaper than metals. It is widely used in making household items including food containers.

● Plastics are poor conductors of heat and electricity and can be used for making handles of frying pans.

Q.36. Choose the thermoplastics and thermosetting plastics from the following: Melamine, Polythene, Bakelite, Polyvinyl chloride.

Answer: Melamine and Bakelite are thermosetting plastics. The plastics which when moulded once, cannot be softened by heating are called thermosetting plastics. For example, Bakelite is a thermosetting plastic which is a poor conductor of heat and electricity. It is used to make electrical switches and handles of utensils. Melamine is a thermosetting plastic which is resistant to fire and can tolerate heat better than other plastics. It is used to make floor tiles, kitchenware and fire-resistant fabrics.

Polythene and poly vinyl chloride are thermoplastics. The plastics which gets deformed easily on heating and can be bent easily are called thermoplastics. For example, polythene and PVC are thermoplastics. These are used in the manufacturing of toys, combs and different types of containers.

Q.37. State two uses of polythene.

Answer: Polythene is a thermoplastic. It is used in the manufacturing of toys, combs and different types of containers.

Q. 38. Write the full form of PVC. Is it thermoplastic or thermosetting plastic?

Answer: The full form of PVC is polyvinyl chloride. PVC is a thermoplastic. The plastics which gets deformed easily on heating and can be bent easily are called thermoplastics.

Q.39. Write two uses of Bakelite.

Answer: Bakelite is a thermosetting plastic. The plastics which when molded once, cannot be softened by heating are called thermosetting plastics. For example, Bakelite is a thermosetting plastic which is a poor conductor of heat and electricity. It is used to make electrical switches and handles of utensils.

Q.40. State two uses of melamine.

Answer: Melamine is a thermosetting plastic. The plastics which when molded once, cannot be softened by heating are called thermosetting plastics. Melamine is a thermosetting plastic which is resistant to fire and can tolerate heat better than other plastics. It is used to make floor tiles, kitchenware and fire-resistant fabrics.

Q. 41 Give two uses of PVC.

Answer: The full form of PVC is polyvinyl chloride. PVC is a thermoplastic. The plastics which gets deformed easily on heating and can be bent easily are called thermoplastics. It is used in the manufacturing of toys, combs and different types of containers.

Q.42. Write some of the uses of plastics in healthcare industry.

Answer: Modern healthcare would not be possible without the use of plastic materials. Plastics can be used in healthcare in the following ways:

● Plastics are used in the packaging of tablets, syringes, doctor's gloves and a number of medical instruments.

● Threads used for stitching wounds are made of medical instruments.

● Plastics are used for making intravenous blood bags and heart valves as well.

Q.43. Classify the following as biodegradable and non-biodegradable materials: Woollen clothes, Polythene bags, Paper, Aluminium cans, Toothbrush, Peels of vegetables and fruits, Cotton cloth, Jute bag, Electric switch, Frying pan handle.

Answer: A material which gets decomposed through natural processes, such as action by bacteria, is called biodegradable. Following are the biodegradable materials:

Woollen clothes, paper, peels of vegetables and fruits, Cotton cloth and Jute bag.

A material which is not easily decomposed by natural processes is termed as non-biodegradable. Following are the non-biodegradable materials:

Polythene bags, Aluminium cans, Toothbrush, Electric switch and Frying pan handle.

Q.44. State whether plastic is biodegradable or non-biodegradable? Give reasons for your answer.

Answer: Plastic is non-biodegradable. It takes several years for plastic to decompose and it is not environment friendly. It causes environmental pollution. Also, the burning process of synthetic material is quite slow. It does not get completely burnt easily. It releases lots of poisonous fumes into the atmosphere when burned and causes air pollution.

Q.45. Explain how, the use of plastics has a bad effect on the environment.

Answer: The use of plastic has a bad effect on the environment because it is non-biodegradable. It takes several years for plastic to decompose and it is not environment friendly. It causes environmental pollution. Also, the burning process of synthetic material is quite slow and it does not get completely burnt easily. It releases lots of poisonous fumes into the atmosphere when burned and causes air pollution.

Q.46. Explain why, the disposal of plastic wastes is a major problem. Give two reasons only.

Answer: The disposal of plastic wastes is a major problem because of the following reasons:

(i) Plastic is non-biodegradable. It takes several years for plastic to decompose and it is not environment-friendly.

(ii) It causes environmental pollution.

(iii) The disposal of plastic wastes is a major problem. Plastics cannot be burnt because they release poisonous gases.

(iv) Plastic bags thrown in the garbage can be swallowed by the animals such as cows. It can result in choking their respiratory system and can be fatal. Therefore, we must avoid the use of plastic as much as possible.

Q.47. What are the various ways to save the environment from excessive plastic wastes?

Answer: Plastic is non-biodegradable. It takes several years for plastic to decompose and it is not environment friendly. It causes environmental pollution. Following are the ways to save the environment from excessive plastic wastes:

● We must try to Reduce, Reuse, Recycle and recover the use of plastic items. We must develop the habits which are environment friendly.

● We must not throw plastic in the water bodies or on the roads.

● We must take a cotton carry bag or a jute bag while shopping.

● We must try to minimize the use of plastic materials. For example, we must use a steel lunch box or steel containers instead of plastic ones.

Q.48. How do carelessly thrown plastic bags (polythene bags) affect:

(a) dirty water drains and sewers?

(b) animals (such as cows)?

Answer: (a) Plastic is non-biodegradable. It takes several years for plastic to decompose. When thrown in the water drains or in sewers it results in choking of the drains. Therefore, we must avoid the use of plastic as much as possible.

(b) Plastic bags thrown in the garbage can be swallowed by the animals such as cows. It can result in choking their respiratory system and can be fatal. Therefore, we must avoid the use of plastic as much as possible.

Q.49.What is meant by the 3R's principle in the context of use of plastics?

Answer: 3R's principle in the context of use of plastics means we must try to Reduce, Reuse and Recycle the use of plastic items. We must develop the habits which are environment-friendly. In order to achieve this, we must not throw plastic in the water

bodies or on the roads. We must take a cotton carry bag or a jute bag while shopping. We must try to minimize the use of plastic materials. For example, we must use a steel lunch box or steel containers instead of plastic ones.

Q.50.State the various ways in which we can avoid (or minimize) the use of plastics.

Answer: We must try to Reduce, Reuse, Recycle and recover the use of plastic items. We must develop the habits which are environment friendly. In order to achieve this, we must try to do the following:

● We must take a cotton carry bag or a jute bag while shopping.

● We must try to minimize the use of plastic materials. For example, we must use a steel lunch box or steel containers instead of plastic ones.

● We must not throw plastic in the water bodies or on the roads.

Long Answer Type Questions

Q.51 A. What is rayon? How is rayon made?

Answer: Rayon is the man-made fibre prepared from the natural materials. It is the man-made fibre which is regarded as artificial silk. It is obtained by the chemical treatment of wood pulp or cellulose. Although rayon is obtained from natural source, wood pulp, yet it is a manmade fibre. Its fibers can also be woven like those of natural fibers. It is cheaper than silk but can be woven like silk fibers. It can also be dyed in a variety of colours.

Q.51 B. Give any two uses of rayon.

Answer: Rayon can be used in the following ways:

● It can be mixed with cotton to make bed sheets.

● It can also be mixed with wool to make carpets.

● It is also used in textile industry to make textiles.

Q.52 A. What are synthetic fibers? Name any two synthetic fibers.

Answer: Synthetic fibers are man-made fibers which are made up of small units which are joined together. These units are made of chemical substances. Such small units combine to form a large single unit called a polymer. Hence, a polymer is made of many repeating units. Polymers also occur in nature.

Example: Rayon and Nylon are synthetic fibers. Rayon is obtained by the chemical treatment of wood pulp or cellulose. Nylon is the first fully synthetic fibre. It was prepared from coal, water and air.

Q.52 B. Why have synthetic fibers become more popular than natural fibers?

Answer. Synthetic fibers become more popular than natural fibers because they are cheaper than natural fibers. The raw materials for synthetic fibers are mainly petrochemicals such as coal. Hence, the manufacturing of synthetic fibers helps in the conservation of forests. Synthetic fibers are used in the manufacture of a variety of household articles such as ropes, buckets, furniture, containers, etc. to highly specialized uses in aircrafts, ships, space crafts, healthcare, etc.

Q.53 A. What are thermoplastics? Give two examples of thermoplastics.

Answer: Plastic is a polymer like a synthetic fibre. The arrangement of units in a plastic can be linear or cross-linked. The plastics which gets deformed easily on heating and can be bent easily are called thermoplastics. For example, polythene and PVC are thermoplastics. These are used in the manufacturing of toys, combs and different types of containers.

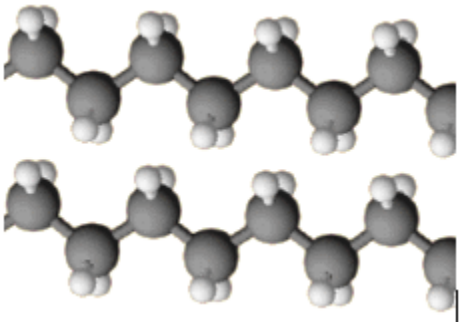
Q.53 B. What are thermosetting plastics? Give two examples of thermosetting plastics.

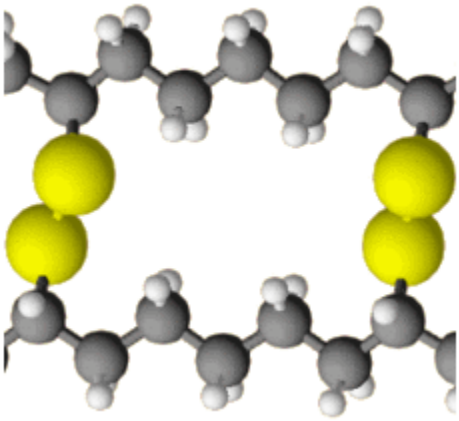
Answer: Thermosetting plastics: The plastics which when moulded once, cannot be softened by heating are called thermosetting plastics. For example, Bakelite is a thermosetting plastic which is a poor conductor of heat and Melamine is a thermosetting plastic which is resistant to fire and can tolerate heat better than other plastics. It is used to make floor tiles, kitchenware and fire resistant fabrics. It is used to make electrical switches and handles of utensils.

Q.54. Explain why, thermoplastics become soft on heating but thermosetting plastics do not become soft on heating. Draw labelled diagrams to illustrate your answer.

Answer: Thermoplastic materials are made of polymers which are linked by intermolecular forces, forming linear or branched structures. On the other hand, thermosetting plastics are those materials that are made by polymers joined together by chemical bonds, having a highly-crosslinked polymer structure. In case of thermoplastics, the shape hardens when it is cooled, but can be reshaped when heated up again. Polythene is a thermoplastic polymer. Its tangled polymer chains can uncoil and slide past each other, making it a flexible material. On the other hand, Thermosetting polymers, once moulded, cannot be softened when heated. They cannot be reshaped. Vulcanised rubber is a thermosetting polymer which is used to make tyres. Its polymer chains are joined together by cross-links, so they cannot slide past each other easily.

Thermoplastic polymers





Thermosetting polymer with cross links.

Q.55. What is meant by biodegradable and non-biodegradable materials? Give examples of two biodegradable and two non-biodegradable materials.

Answer:

The materials which gets decomposed through natural processes, such as by the action of microorganisms are called biodegradable materials. For example, peels of vegetables and fruits, cotton clothes, wood and paper are biodegradable substances. These materials are easily decomposed by microorganisms. Temperature and sunlight may also play roles in the decomposition of biodegradable plastics and other materials.

The materials which are not easily decomposed by natural processes are called non-biodegradable materials. For example, tin, aluminium and other metal cans and plastics are non-biodegradable materials. Plastics can take several years to decompose. These materials are not environmental friendly and cause environmental pollution.

Multiple Choice Questions (MCQs)

Q.56. Rayon is different from truly synthetic fibers because:

Answer: Rayon is the man-made fibre which is regarded as artificial silk. It is obtained by the chemical treatment of wood pulp or cellulose.

Q.57. The synthetic material which can be used for marking fabrics as well as shatterproof bottles and jars is:

Answer:

Polyester is the synthetic fibre which contains the organic group similar-to those which give fruits their sweet smell. PET is a very familiar form of polyester. It is used for making bottles and utensils which is replacing materials like glass.

Q.58. Which of the following has cross-linked polymer chains?

Answer: Bakelite is a thermosetting plastic which is a poor conductor of heat and electricity. It is used to make electrical switches and handles of utensils.

Q.59. The man-made fibre made from the cellulose polymer is:

Answer: Rayon is obtained by the chemical treatment of wood pulp or cellulose. It is the man-made fibre which is regarded as artificial silk.

Q.60. Which of the following is not a thermoplastic polymer?

Answer: The plastics which gets deformed easily on heating and can be bent easily are called thermoplastics. For example, polythene and PVC are thermoplastics.

Q.61. The synthetic polymer which can be used as a substitute for wool for making sweaters and shawls, etc. is:

Answer: Acrylic is a synthetic fibre which appears to resemble wool. It is flexible, resistant to moth, oil and chemicals. It is used for making sweaters and tracksuits and also for the linings of boots and gloves.

Q.62. Which of the following is not a synthetic fibre?

Answer: Flax is a blue-flowered herbaceous plant that is cultivated for its seed and for textile fiber made from its stalks.

Q.63. The synthetic fibre which contains the group similar to those which give fruits their ‘sweet smell’ is:

Answer: Polyester is the synthetic fibre which contains the organic group similar-to those which give fruits their sweet smell. Terylene is a kind of a polyester.

Q.64. The man-made fibre which contains identical to:

Answer: Cotton is a natural fibre.

Q.65. One of the following man-made fibre is not prepared from raw materials obtained from petrochemicals. This one is:

Answer: Rayon is obtained by the chemical treatment of wood pulp or cellulose.

Q.66. Which of the following plastics do not have cross-links between their polymer chains

(A) Nylon **(B)** Nekamine **(C)** Terylene **(D)** Bakelite

Answer: Nylon and Terylene are thermoplastic polymers. They do not have cross-links between their polymer chains.

Q.67. The clothes of a person working in the kitchen catch fire accidently causing severe burns. The person is most likely wearing clothes made of:

Answer: Terylene is a synthetic fibre. If the clothes made of synthetic fibers catch fire, it can be very dangerous. The fabric will melt and can stick to the body of the person wearing it causing severe burns.

Q.68. The plastic which is coated on the uniforms of firemen to make them fire-resistant is:

Answer

Melamine is a thermosetting plastic which is resistant to fire and can tolerate heat better than other plastics. It is used to make floor tiles, kitchenware and fire resistant fabrics.

Q.69. Which of the following is a man-made fibre prepared from wood-pulp?

Answer: Rayon is obtained by the chemical treatment of wood pulp or cellulose. It is the man-made fibre which is regarded as artificial silk.

Q.70. The manufacture of one of the following artificial fibers contributes to deforestation this fibre is:

Answer: Rayon is obtained by the chemical treatment of wood pulp or cellulose causing deforestation.

Q.71. The non-stick coating on frying pans is that of a plastic called:

Answer: Teflon is a special plastic on which oil and water do not stick. It is used for nonstick coating on cook wares.

Q.72. Which of the following plastics is used for making electric switches?

Answer: Bakelite is a thermosetting plastic which is a poor conductor of heat and electricity. It is used to make electrical switches and handles of utensils.

Q.73. Which of the following are thermosetting polymers?

(A) Melamine **(B) Terylene** **(C) Polythene** **(D) Bakelite**

Answer: Bakelite is a thermosetting plastic which is a poor conductor of heat and electricity. It is used to make electrical switches and handles of utensils. Melamine is a thermosetting plastic which is resistant to fire and can tolerate heat better than other plastics. It is used to make floor tiles, kitchenware and fire-resistant fabrics.

Q.74. The similarity between artificial silk and cotton is that:

Answer: Rayon is obtained by the chemical treatment of wood pulp or cellulose. It is the man-made fibre which is regarded as artificial silk.

Q.75. Which of the following plastic objects can be recycled?

(A) Electric socket (B) Polythene bag (C) PVC pipe (D) Ashtray

Answer:

Polythene bag and PVC pipe are the thermoplastics which can be recycled.

Questions Based on High Order Thinking Skills (HOTS)

Q.76. Match the terms of column A correctly with the phrases given in column B:

Column A	Column B
(i) Polyester	**(a)** Prepared by using wood pulp
(ii) Teflon	**(b)** Used for making parachutes
(iii) Rayon	**(c)** Used to make non- stick cookware
(iv) Nylon	**(d)** Fabrics do not wrinkle easily

Answer(i) Polyester - (d) Fabrics do not wrinkle easily

Fabrics made from polyester does not get wrinkled easily. It remains crisp and easy to wash. Hence, it is suitable for making dress material.

(ii) Teflon - (c) Used to make non- stick cookware

Teflon is a special plastic on which oil and water do not stick. It is used for nonstick coating on cook wares.

(iii) Rayon - (a) Prepared by using wood pulp

Rayon is obtained by the chemical treatment of wood pulp or cellulose. It is the man-made fibre which is regarded as artificial silk.

(iv) Nylon - (b) Used for making parachutes

Nylon is the first fully synthetic fibre. It was prepared from coal, water and air. It is used for making parachutes and rock-climbing ropes.

Q.77. Which plastic is used:

(a) for making uniforms of fire-men fire resistant?

(b) for giving non-stick coating on frying pans?

(c) for making handles of frying pans?

(d) for making insulation of electric wires?

(e) for making electric switches?

(f) for making flexible water bottles?

Answer: (a) Melamine is a thermosetting plastic which is resistant to fire and can tolerate heat better than other plastics. It is used to make floor tiles, kitchenware and fire-resistant fabrics. It is also used for making uniforms of fire-men.

(b) Teflon is used for giving non-stick coating on frying pans. It is a special plastic on which oil and water do not stick. It is used for nonstick coating on cook wares.

(c) Bakelite is used for making handles of frying pans. Frying pan handles are made with thermosetting plastics which are resistant to fire and can tolerate heat better than other plastics. For example, Bakelite is a thermosetting plastic which is a poor conductor of heat and electricity.

(d) PVC (Polyvinyl chloride) is used for making wire insulation.

(e) Bakelite is a thermosetting plastic which is a poor conductor of heat and electricity. It is used to make electrical switches and handles of utensils.

(f) PET is used for making flexible water bottles. It is a very familiar form of polyester. It is used for making bottles and utensils which is replacing materials like glass.

Q.78. Which of the following articles made of plastics 'can be recycled' and which cannot be recycled'? give reasons for your choice?

Telephone instruments, plastic toys, cooker handles, plastic covering on electrical wires, electric switches, ballpoint pens, carry bags, plastic bottles, plastic chairs

Answer: PVC (Polyvinyl chloride) bags, Plastic bottles and Plastic chairs are made of thermoplastics. These articles can be recycled. **Thermoplastic** materials are made of

polymers which are linked by intermolecular forces, forming linear or branched structures. In case of thermoplastics, the shape hardens when it is cooled, but can be reshaped when heated up again. Polythene is a thermoplastic polymer. Its tangled polymer chains can uncoil and slide past each other, making it a flexible material.

Telephone instruments, Cooker handles, Electric switches and Ball point pens are made of Thermosetting plastics. Thermosetting plastics are those materials that are made by polymers joined together by chemical bonds, having a highly-crosslinked polymer structure. Thermosetting polymers, once moulded, cannot be softened when heated. They cannot be reshaped.

Q.79. Out of the following materials:

cotton, nylon, terylene, wool, Pet, acrylic

(a) which materials are polyesters?

(b) which materials is a polyamide?

(c) which material is used as a substitute for wool?

(d) which material is used as a substitute for glass?

Answer: (a) Terylene and PET are polyesters. Polyester is the synthetic fibre which contains the organic group similar-to those which give fruits their sweet smell. PET is a very familiar form of polyester. It is used for making bottles and utensils which is replacing materials like glass.

(b) Nylon is a polyamide. Nylon is the first fully synthetic fibre. It was prepared from coal, water and air. It is used for making parachutes and rock-climbing ropes.

(c) Acrylic is used as a substitute for wool. It is a synthetic fibre which appears to resemble wool. It is flexible, resistant to moth, oil and chemicals. The clothes made from acrylic are relatively cheap and are available in a variety of colours.

(d) PET is a material used as a substitute for glass. It is a form of polyester. Polyester is the synthetic fibre which is made up of repeating units of a chemical called an ester. Esters are the chemicals which give fruits their smell. PET is used for making bottles, utensils, films and wires.

Q.80. The synthetic fibre A is chemically a polyamide whereas the synthetic fibre B contains a large number of ester groups. another synthetic fibre C is made of a polymer D which consists of a number of glucose units joined one after the other.

(a) Which fibre could be (i) terylene (ii) rayon and nylon?

(b) Name the polymer D.

(c) Which fibre (A, B or C) is prepared from a natural raw material?

(d) Which fibre (A, B or C) contains the same type of groups as those in a PET jar?

Answer: (i) terylene could be the synthetic fibre B which contains a large number of ester groups.

(ii) Rayon could be the synthetic fibre C which is made of polymer D containing glucose.

(iii) Nylon could be the fibre A which is chemically a polyamide is nylon. It is the first fully synthetic fibre. It was prepared from coal, water and air.

(b) Polymer D is Cellulose. A polymer is made of many repeating units. Polymers also occur in nature. For example, cotton is a natural polymer which is made from the cellulose. Cellulose is made up of a large number of glucose units.

(c) Fibre C is prepared from a natural raw material. Fibre C is Rayon. Rayon is obtained by the chemical treatment of wood pulp or cellulose. It is the man-made fibre which is regarded as artificial silk.

(d) The fibre B which is terylene contains the same type of groups as those in a PET jar. Terylene and PET are both polyesters.