

CHAPTER – 1

MATERIALS AROUND US

VERY SHORT ANSWER TYPE (2 MARKS):

1. Which of the following is a material with lustre? Wood, aluminium, plastic, cotton.

Answer: Aluminium (Metals typically possess a characteristic metallic shine or lustre).

2. Which material is generally used for making a pen?

Answer: Plastic or Metal (like steel/brass).

3. Name a liquid which floats on the surface of water.

Answer: Mustard oil (or any vegetable oil/kerosene), because its density is lower than that of water and it is immiscible.

4. Name two objects made from opaque materials.

Answer: A wooden chair and a steel container (light cannot pass through them).

5. Name a substance which exists in all the three states.

Answer: Water (H₂O). It exists as ice (solid), water (liquid), and water vapour (gas).

6. Name a liquid substance which is a good conductor of heat.

Answer: Mercury (Hg), which is a liquid metal at room temperature.

7. Which materials allow light to pass through them?

Answer: Transparent materials (e.g., clear glass, pure water, clear air).

8. Why is a tumbler not made with a piece of cloth?

Answer: A tumbler is meant to hold liquids. Cloth has fine pores through which liquids easily leak or seep out.

9. Out of wax and stone, which will sink and which will float on water?

Answer: Wax will float (density < water) and stone will sink (density > water).

10. Name two solids that have an odour or smell.

Answer: Camphor and Naphthalene (both undergo sublimation and release distinct aromas).

11. What are elastic materials? Give an example.

Answer: Materials that can regain their original shape and size after the deforming force is removed.

Example: Rubber band.

12. What are brittle solids?

Answer: Solids that break easily into pieces when stressed or struck with a force rather than bending.

Example: Glass, Chalk.

13. Salt is a powder made up of a number of small particles. Name some other similar substances.

Answer: Sugar powder, Chalk powder, and Sand.

14. What is common between a pen, a coin, a cake of soap and a stone?

Answer: They are all solids at room temperature; they have a definite mass, volume, and fixed shape.

15. In this list of items, identify the substance which is transparent: Glass tumbler, steel plate, aluminium foil, soap, plasticine.

Answer: Glass tumbler.

16. Name two solids which are soluble in water.

Answer: Sugar and Common salt (Sodium Chloride).

17. Name two solids which are insoluble in water.

Answer: Sand and Chalk powder.

18. Name few materials which are metals.

Answer: Iron (Fe), Copper (Cu), Aluminium (Al), and Gold (Au).

19. Name few materials which are non-metallic.

Answer: Wood, Plastic, Rubber, and Carbon.

20. Name few objects which are attracted by a magnet.

Answer: Iron nails, Steel paper clips, and Sewing needles.

SHORT ANSWER TYPE (3 MARKS):

1. Why do we use glass panes in windows and showcases?

Answer: Glass is a transparent material that allows visible light to pass through it cleanly. This lets us see things clearly inside a showcase or outside a window without opening it.

2. What are miscible and immiscible liquids? Explain with examples.

Answer: Miscible Liquids: Liquids that mix completely with each other to form a single, uniform phase.
Example: Water and Alcohol or Water and Vinegar.

Immiscible Liquids: Liquids that do not mix with each other and separate out into distinct layers when left undisturbed. Example: Water and Mustard oil.

3. What types of substances float on water and what type of substances sink? Give two examples of each.

Answer: Substances with a lower density than water float. Examples: Cork, Wood, Ice.

Substances with a higher density than water sink. Examples: Iron nail, Stone.

4. Define the terms malleable and ductile.

Answer: **Malleability:** The property of a material (mostly metals) by which it can be beaten into thin sheets without breaking.

Ductility: The property of a material by which it can be drawn out into long, thin wires.

5. Which of the given materials would you choose to make a school bell and why? Plastic, wood, brass, stone.

Answer: Brass. Metals like brass are sonorous, meaning they produce a deep, ringing, long-lasting sound when struck hard. Plastic, wood, and stone do not have this acoustic property.

6. Most of the substances show more than one property. Classify the given objects on the basis of more than one property: Iron nails, stone, paper, butter.

Answer: Iron nails: Hard, metallic, lustrous, magnetic, conductor of heat/electricity.

Stone: Hard, opaque, non-magnetic, insoluble in water, sinks in water.

Paper: Soft, combustible, flexible, opaque/translucent, floats on water initially.

Butter: Soft, insoluble in water, floats on water, translucent, melts easily upon heating.

7. Identify what is common between the pairs of substances given below:

Salt and sand, salt and sugar, wood and paper, oil and butter.

Answer: Salt and sand: Both are granular solids at room temperature.

Salt and sugar: Both are white, crystalline solids that are completely soluble in water.

Wood and paper: Both are organic plant derivatives consisting primarily of cellulose and are highly combustible.

Oil and butter: Both are lipids (fats), insoluble in water (hydrophobic), and lighter than water.

8. Consider the following examples and classify them on the basis of classification keys as hard, soft, weak, strong, brittle and non-brittle:

(i) Aluminium foil (ii) Paper bag (iii) Glass table top (iv) Stone

Answer: Aluminium foil – Soft, Strong and Non-brittle.

Paper bag – Soft, Weak and Non-brittle.

Glass table top – Hard and Brittle.

Stone – Hard, Strong and Brittle

9. Two groups of objects are shown below. Which group represents malleable objects? What does the other group represents?

Group A: Chalk, brick, lump of soil

Group B: Bottle cap, screw, nail

Answer: Group B represents malleable objects (they are metallic items that can deform without breaking). Group A represents brittle objects, which crumble or break easily when structural pressure is applied.

10. What are the similarities between iron, copper and aluminium?

Answer: They are all metals.

2. They have lustre (metallic shine).

3. They are good conductors of heat and electricity.

4. They are malleable and ductile.

11. Write any five properties of material which can be used as the basis of sorting.

Answer: Appearance / Lustre (Shiny vs. Dull)

2. Hardness (Hard vs. Soft)

3. Solubility in water (Soluble vs. Insoluble)

4. Floatation (Floats vs. Sinks in water)

5. Transparency (Transparent, Translucent, or Opaque)

12. Metals have lustre (shine). Give reason why some metal articles become dull and lose their shine?

Answer: Metals chemically react with oxygen, carbon dioxide, and moisture present in the atmosphere. This forms a thin layer of oxides, hydroxides, or carbonates on their surface (corrosion/tarnishing), dulling their original sheen.

13. Metals are generally solids and are hard. Name a metal which is liquid and a metal which is soft.

Answer: Liquid metal: Mercury (Hg)

Soft metal: Sodium (Na) or Potassium (K) (can be sliced easily with a common kitchen knife).

14. Why water is called a universal solvent?

Answer: Water can dissolve a wider variety of chemical substances (polar molecules and ionic compounds) than any other known liquid compound on Earth.

15. Why do we use a specific material for making certain articles such as metals for utensils? What type of material should be used for the handles of utensils?

Answer: Materials are selected based on their operational properties. UTensils require materials with high thermal conductivity and melting points (like stainless steel, copper, or aluminium) to cook food quickly.

The handles, conversely, must be made of thermal insulators (like Bakelite, plastic, or wood) to protect our hands from the transferred heat.

LONG ANSWER TYPE (5 MARKS):

1. Identify the magnetic materials in the following items and list them– iron nails, hair pins, paper cups, rubber, wood, aluminium wires and plastic rod.

Answer: Iron nails and steel hair pins (Ferromagnetic metals). The rest are non-magnetic.

2. Show with the help of an experiment that water is transparent.

Answer: Procedure: Drop a small steel coin or a brightly coloured marble into a clear glass beaker filled up with clean water.

Observation: Look directly down through the water layer from above the beaker. The structural details, markings, and exact edges of the coin remain fully visible.

Conclusion: Because light rays reflect cleanly from the submerged coin and travel unobstructed through the liquid phase to reach our eyes, water is classified as a transparent medium.

3. Why do shopkeepers usually prefer to keep some materials in transparent containers? What should be these containers made up of?

Answer: Transparent containers let customers instantly view the inventory items inside (candies, biscuits, pulses) without manual opening. These display containers are typically engineered from high-clarity glass or clear thermoplastics (like PET or Acrylic).

4. Name some substances which are made from plastic, paper, leather, steel, wood.

Answer: Plastic: Buckets, toys, water bottles.

Paper: Books, notebooks, cardboard boxes.

Leather: Belts, jackets, shoes, wallets.

Steel: Utensils, surgical scalpels, structural beams.

Wood: Tables, doors, baseball bats, pencils.

5. What is common in the following?

- (i) A bag, a purse, a belt and seat cover (ii) Lemon juice, orange juice, honey and milk
(iii) Metal, wood, cardboard and brick (iv) Gold, silver, aluminium and copper
(v) Stone, glass and iron nails

Answer: (i) A bag, a purse, a belt and seat cover: They are typically fabricated using flexible, durable sheet materials like leather or polymer synthetics.

(ii) Lemon juice, orange juice, honey and milk: They are all liquid/viscous fluids that are thoroughly soluble/miscible in water.

(iii) Metal, wood, cardboard and brick: They are all highly rigid, opaque solids.

(iv) Gold, silver, aluminium and copper: They are all highly lustrous, malleable, ductile metals and premium electrical conductors.

(v) Stone, glass and iron nails: They are highly rigid, hard materials that sink in water due to high density.

6. A) In which of the following sets does each object exist as a solid at room temperature?

- (i) Mercury, iron and gold (ii) Stone, water and cricket ball
(iii) Salt, sugar and cork (iv) Oxygen, nitrogen and sulphur
(v) copper, Silver and gold

Answer. The completely solid set at room temperature is (v) Copper, silver and gold and

(iii) Salt, sugar and cork.

B) You are given samples of common salt and chalk powder without labelling. How will you identify two samples? Explain.

Answer: Add a spoonful of each sample separately into two glasses of water and stir.

The sample that completely dissolves to yield a perfectly clear solution is common salt.

The sample that remains insoluble, turns the water turbid, and slowly settles at the bottom is chalk powder.

7. From the following sets of non-living objects, sort out all the groups in man-made and naturally occurring substances:

- (i) Water, air, car (ii) stone, water, petroleum
(iii) Soil, computer, gold (iv) Iron, bicycle, calcium (v) Silver, butter, soap

Answer: Naturally Occurring Groups: (ii) Stone, water, petroleum.

Man-made & Natural Mixtures:(i) Water, air (Natural); Car (Man-made).

(iii) Soil, gold (Natural); Computer (Man-made).

(iv) Iron, calcium (Natural/Elemental); Bicycle (Man-made).

(v) Silver (Natural); Butter, soap (Processed/Man-made).

8. Differentiate among opaque, translucent and transparent materials, by giving two examples of each.

Answer: 1. Opaque Materials:

Definition: Opaque materials do not allow any light to pass through. Objects on the other side of an opaque material cannot be seen.

Examples: Wood, Metal sheet

2. Translucent Materials:

Definition: Translucent materials allow some light to pass through, but objects on the other side appear blurred or unclear.

Examples: Frosted glass, Wax paper

3. Transparent Materials:

Definition: Transparent materials allow light to pass through completely, so objects on the other side can be clearly seen.

Examples: Clear glass, Clear plastic sheet

SUBJECTIVE QUESTIONS:

1. Things can be grouped on the basis of our senses also. Give one example each of the materials based on senses.

Answer: Sense of Sight (Appearance): Lustrous things (Shiny gold) vs. Dull things (Coal).

Sense of Touch (Texture): Smooth things (Silk, Polished marble) vs. Rough things (Tree bark).

Sense of Hearing (Acoustics): Sonorous objects (Metallic coins/bells).

2. Name the three states of matter. Which state of matter can easily change its shape and volume?

Answer: Solid, Liquid, and Gas. Gases can effortlessly alter both their configuration and active volume because intermolecular attractive forces are negligible, leaving their constituent particles free to occupy any space.

3. Why are the handles of kitchen utensils made from wood or bakelite? Why do we often use a cloth to pick up utensils from the stove?

Answer: Wood and Bakelite are excellent thermal insulators (poor conductors of heat). They block the heat energy of the cooking vessel from burning our hands. A thick cloth serves the exact same insulating purpose by trapping pockets of air, minimizing conductive thermal transfer.

4. What is the criteria of grouping the materials? Mention the properties which can be used as the basis of grouping.

Answer: Materials are classified systematically based on similarities and variations in their structural/chemical behavior.

Properties used: Physical state, density/floatation, water solubility, transparency, magnetic responsiveness, and thermal/electrical conductivity.

5. Give two examples of substances with the following properties:

(i) Brittle	(ii) Combustible
(iii) Ductile	(iv) Good conductor
(v) Lustrous	(vi) Opaque
(vii) Transparent	(viii) Elastic

Answer: 1. Brittle Substances

Glass – Shatters easily on impact.

Dry clay – Crumbles or breaks under pressure.

2. Combustible Substances

Wood – burns easily while ignited

Kerosene – Highly flammable liquid fuel.

3. Ductile Substances

Copper – Used in electrical wiring due to high ductility.

Aluminium – Can be drawn into thin wires and foils.

4. Good Conductors of Electricity

Silver – Excellent electrical and thermal conductor.

Copper – Widely used in electrical cables.

5. Lustrous Substances

Gold – Shiny yellow metal.

Polished Aluminium – Shiny and reflective.

6. Opaque Substances

Wood – Light does not pass through solid wood.

Iron – Solid metal blocks light completely.

7. Transparent Substances

Clear glass – Objects can be seen clearly through it.

Pure water – Transparent liquid.

8. Elastic Substances

Rubber – Returns to original shape after stretching.

Spring steel – Can be bent or coiled and returns to shape.

6. Make a classification key for the following group of substances:

Air, soap, butter, milk, cotton ball, salt, hydrogen, honey, oil.

Answer: 1. Gas → Air

2. Liquid → Milk

3. Solid → a. Fibrous → Cotton Ball

b. Non-fibrous → i. Fatty → Butter

ii. Non-fatty, man-made → Soap

7. Select those objects from the following which can shine: Glass bowl, plastic toy, steel spoon, cotton shirt.

Answer: Glass bowl and steel spoon are capable of reflecting light cleanly to display a polished gleam.

8. State whether the statements given below are true or false:

Answer: (i) Stone is transparent, while glass is opaque. False (Stone is opaque, glass is transparent).

(ii) A notebook has lustre while eraser does not. False (Neither generally exhibits metallic lustre).

(iii) Chalk dissolves in water. False (Chalk powder is insoluble; it settles out).

(iv) A piece of wood floats on water. True (Wood's density is usually less than water's).

(v) Sugar does not dissolve in water. False (Sugar is highly soluble).

(vi) Oil mixes with water. False (Oil is hydrophobic and immiscible).

(vii) Sand settles down in water. True (Sand is insoluble and heavier than water).

(viii) Vinegar dissolves in water. True (Acetic acid solutions mix completely with water).

9. Given below are the names of some objects and materials: Water, basketball, orange, sugar, globe, apple and earthen pitcher. Group them as:

A) Round shaped and other shapes:

Answer. Round shaped: Basketball, Orange, Globe, Apple, Earthen pitcher.

Other shapes: Water (takes shape of container), Sugar (crystalline/cuboidal blocks).

B) Eatables and non-eatables:

Eatables: Water, Orange, Sugar, Apple.

Non-eatables: Basketball, Globe, Earthen pitcher.

10. Find the odd out from each set of the following:

Answer:A) Chair, bed, table, baby, cupboard: Baby (It is a living organism; the rest are non-living wooden/structural furniture).

B) Rose, jasmine, boat, marigold, lotus: Boat (It is a transport item; the rest are natural flowers).

C) Aluminium, iron, copper, silver, sand: Sand (It is a compound/silicate mixture; the others are elemental metals).

D) Sugar, salt, sand, copper sulphate: Sand (It is insoluble in water; the others form solutions upon mixing).