
4. SORTING MATERIALS INTO GROUPS

SOLUTIONS

TEACHING TASK

JEE MAIN LEVEL QUESTIONS

1. Metals have shiny appearance called:

- A) Smoothness B) Lustre C) Conduction D) Transparency

Answer:B

Solution:Lustre refers to the shiny appearance of metals due to their ability to reflect light.

2. Substance which completely disappears in water is called as:

- A) Soluble B) Insoluble C) Transparent D) Opaque

Answer:A

Solution:A soluble substance dissolves completely in water (e.g., salt, sugar).

3. Which of the following will sink in water:

- A) A dry leaf B) A bird feather C) A plastic scale D) A metal key

Answer:D

Solution:A metal key is denser than water, so it sinks. The others are lighter and tend to float.

4. The liquid which is soluble in water is:

- A) Kerosene B) Coconut oil C) Mustard oil D) Lemon juice

Answer:D

Solution: Lemon juice is miscible with water, while oils and kerosene are not.

5. Identify the translucent material.

- A) Glass B) Frosted glass C) Water D) Air

Answer:B

Solution:Translucent materials allow partial light to pass through (blurry vision), unlike transparent or opaque materials.

6. An iron nail is kept in each of the following liquids. In which case would it lose its shine and appear dull?

- A) Mustard oil B) Soft drink(coca cola) C) Coconut oil D) Kerosene

Answer:B

Solution:Soft drinks contain acids (like carbonic and phosphoric acid), which can react with the iron nail, causing rusting or corrosion. This dulls the nail's surface.

7. Pick one material from the following which is completely soluble in water?

- A) Chalk powder B) Tea leaves C) Glucose D) Saw dust

Answer:C

Solution:Glucose is a sugar and dissolves completely in water. The others (chalk, tea leaves, saw dust) are insoluble or only partially soluble.

8. While doing an activity in class, the teacher asked Paheli to handover a translucent material. Which among the following materials will Paheli pick and give to her teacher?

- A) Glass tumbler B) Mirror C) Muslin cloth D) Aluminum foil

Answer:C

Solution: Muslin cloth allows some light to pass through but not clear images—this makes it translucent.

Other options: Glass tumbler and mirror are transparent/reflective.

Aluminium foil is opaque.

9. Which pair of substances among the following would float in a tumbler half-filled with water?

A) Cotton B) Feather C) Pin, oil drops D) Rubber band, coin

Answer: A, B

Solution: Both cotton and feather are light and have enough surface area to float initially on water.

JEE ADVANCED LEVEL QUESTIONS

Multi correct answer type:

10. You are provided with following materials. Which of the following materials will you identify as transparent?

A) Magnifying glass B) Mirror C) Stainless steel D) Glass tumbler

Answer: A, D

Solution:

A) Magnifying glass – Made of clear glass/plastic, transparent.

D) Glass tumbler – Also allows light to pass through clearly.

B) Mirror – Reflects light, not transparent.

C) Stainless steel – Opaque and reflective.

11. Sejal found a bag containing the following materials, Help Sejal in finding the materials which is/are opaque

A) Mirror B) Paper stained with oil C) Magnet D) Glass spectacles

Answer: A, C

Solution: A) Mirror – Reflects light, but doesn't let it pass through = opaque.

C) Magnet – Solid and metallic = opaque.

B) Paper stained with oil – Translucent (partially see-through).

D) Glass spectacles – Transparent.

12. Which of the following statements are true?

A) Materials are grouped for convenience.

B) Materials are grouped to study their properties.

C) Materials are grouped for fun.

D) Materials are grouped according to their use.

Answer: A, B, D

Solution: Grouping materials helps organize knowledge, study behavior, and decide their uses.

Assertion and Reason Type:

A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

B) Both Assertion and Reason are true, but Reason is NOT the correct explanation for Assertion.

C) Assertion is true, but Reason is false. D) Assertion is false, but Reason is true.

13. Assertion : copper, aluminum, silver are good conductors of electricity

Reason : These are the materials that allow the easy flow of electrical

charge (electricity)

Answer:A

Solution: Assertion (True): Copper, aluminum, and silver are indeed excellent conductors of electricity due to their free electrons that facilitate charge movement.

Reason (True): The reason correctly defines conductors as materials that allow the easy flow of electrical charge.

Explanation Check: The reason directly explains why these metals are good conductors.

14. Assertion : Sugar (sucrose) is soluble in water.

Reason : Soluble Materials that can dissolve in a particular solvent.

Answer:A

Solution: Sugar dissolves in water, and the reason clearly explains the meaning of solubility.

Comprehension Type:

Materials can be classified based on their behavior during combustion, which is the process of burning. Combustion involves a chemical reaction between a material and oxygen, typically resulting in the release of heat and the formation of new substances. Here are the main classifications based on combustion:

15. Which of the following materials that can undergo combustion?

A) Wood B) Paper C) Petrol D) All the above

Answer:D

Solution:Wood, paper, and petrol are all combustible materials, meaning they can catch fire and burn in the presence of oxygen.

16. Materials that do not easily catch fire or burn under normal conditions are called

A) Combustible materials B) Non-Combustible materials

C) Semi Combustible materials D) All the above

Answer:B

Solution:Non-combustible materials are those that do not burn easily—e.g., metals, glass, and stone.

Integer type:

17. Wood, Metal, Brick, Cardboard, Frosted glass, Wax paper - out of them how many are Translucent Materials ?

Answer:2

Solution:Frosted glass – Translucent

Wax paper – Translucent

Wood, Metal, Brick, Cardboard – Opaque

18. Based on electrical conductivity materials are classified into how many types?

Answer:3

Solution:Materials are generally classified into:

Conductors (e.g., copper, aluminium)

Insulators (e.g., rubber, plastic)

Semiconductors (e.g., silicon)

19. rocks, minerals, Glass, Cork, Styrofoam - out of them how many can float on

water ?

Answer:2

Solution:Cork – Floats (low density)

Styrofoam – Floats (very low density)

Rocks, minerals, glass – Sink (high density)

Matrix Matching Type:

20. Column-I

Column-II

A) Rubber

1) Combustible substance

B) Paper

2) Transparent material

C) Metals

3) Electric Insulator

D) Water

4) Sinking material

Answer:A-3,B-1,C-4,D-2

Solution:

A) Rubber

3) Electric Insulator

B) Paper

1) Combustible substance

C) Metals

4) Sinking material

D) Water

2) Transparent material

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS

1. Which of the following materials is hard?

A) Cotton B) Paper C) Sponge D) Table

Answer:D

Solution:A table is made of wood or metal — hard materials. Others like cotton, sponge, and paper are soft.

2. Which of the following will float on water?

A) Iron B) Ice C) Stone D) Book

Answer:B

Solution:Ice is less dense than water and floats. Iron, stone, and books sink.

3. An object can be made of different ____.

A) Materials B) Shape C) Size D) All of the above

Answer:D

Solution:An object can be:

Made of different materials (e.g., a chair can be made of wood, plastic, or metal).

Have different shapes (e.g., a bottle can be round, square, or cylindrical).

Come in different sizes (e.g., a ball can be small, medium, or large).

4. Which of the following is a miscible liquid?

A) Ink B) Petrol C) Oil D) Milk

Answer:A

Solution:Ink dissolves in water. Petrol, oil, and milk are either immiscible or form suspensions.

5. Heavy substances ____ in water.

A) Sink B) Float C) Sometimes sink and sometimes float D) First float, then sink

Answer:A

Solution:Heavier and denser substances sink in water.

6. The liquids that dissolve in one another are called ____.

A) Immiscible B) Miscible C) Insoluble D) None

Answer:B

Solution: Miscible liquids mix completely, like ink in water.

7. The property of materials to be compressed easily is ____.

A) Softness B) Hardness C) Lustre D) All the above

Answer:A

Solution: Soft materials (like sponge or cotton) can be compressed easily.

8. The materials which allow light to pass through them completely are called ____.

A) Transparent B) Translucent C) Opaque D) Lustrous

Answer:A

Solution: Transparent materials like glass or clear plastic let all light pass through.

9. The substances that allow light to pass through them partially are called ____.

A) Transparent B) Translucent C) Opaque D) Lustrous

Answer:B

Solution: Translucent materials (like frosted glass) allow partial light.

10. Which of the following materials is transparent?

A) Stainless steel plate B) Glass tumbler C) Mirror D) Plastic bottle

Answer:B

Solution: Glass tumbler allows light to pass through.

Mirror reflects, plastic bottle may be translucent or opaque, steel plate is opaque.

JEE MAIN LEVEL QUESTIONS

11. Which of the following materials is translucent?

A) Stained glass B) Mirror C) Wall D) Cloth

Answer:A

Solution: Translucent materials allow light to pass through but scatter it, making objects appear blurry.

Stained glass lets light through but is not fully transparent (correct answer).

Mirror is opaque and reflects light.

Wall is opaque (no light passes).

Cloth can be translucent (if thin) but is generally opaque.

12. Which of the following materials do not have lustre?

A) Iron B) Gold C) Plastic D) Clothes

Answer:C,D

Solution: Lustre refers to a shiny appearance, and metals like gold and iron typically have a lustrous quality. Plastic and clothes, on the other hand, are considered non-lustrous materials.

13. Which of the following materials do not have lustre?

A) Iron B) Gold C) Plastic D) Clothes

Answer:C,D

Solution: Lustre refers to a shiny appearance, and metals like gold and iron typically have a lustrous quality. Plastic and clothes, on the other hand, are considered non-lustrous materials.

14. Which of the following statements is incorrect?

A) Some materials appear shiny, while others appear dull.

B) Some materials are rough, while others are smooth.

- C) Certain materials are hard, while others are soft.
D) Some stones are transparent, while some glasses are opaque.

Answer:D

Solution:A, B, C are correct (materials vary in shine, texture, hardness).
D is incorrect because:

Most stones are opaque (except rare ones like quartz).

Glass is usually transparent/translucent, not opaque (unless treated).

15. All gases in the air are ____ conductors of heat.

- A) Good B) Bad C) Both A and B D) Sometimes good, sometimes bad

Answer:B

Solution:Gases are generally poor conductors of heat — that's why air is used as an insulator (e.g., in thermos flasks or jackets).

16. Choose the odd one out of the given options below.

- A) Gold B) Silver C) Diamond D) Plastic

Answer:D

Solution:Gold, Silver, Diamond are natural, precious materials with high value and lustre.

Plastic is man-made, non-metallic, and less valuable (odd one out).

17. Purpose of sorting materials into groups is

- A) to study their properties B) convenience C) both A) and B) D) Mud

Answer:C

Solution:Sorting helps in studying properties (e.g., hardness, solubility).

It also provides convenience (easy identification and usage).

18. Which one of the following liquids is immiscible with water?

- A) Vinegar B) Glycerine C) Lemon juice D) Kerosene

Answer:D

Solution:Immiscible means does not mix with water.

Vinegar, Glycerine, Lemon juice dissolve in water (miscible).

Kerosene (oil-based) floats on water (immiscible).

19. Which one of the following liquids is immiscible with water?

- A) Vinegar B) Glycerine C) Lemon juice D) Kerosene

Answer:D

Solution:Immiscible means does not mix with water.

Vinegar, Glycerine, Lemon juice dissolve in water (miscible).

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20. Which one of the following liquids is immiscible with water?

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Answer:D

Solution:Immiscible means does not mix with water.

Vinegar, Glycerine, Lemon juice dissolve in water (miscible).

Kerosene (oil-based) floats on water (immiscible).

21. We see a number of things lying around us. For example. pen, paper, chair, cooking utensils, water, fruits etc. Choose the option which is not related to them.

- A) They have varying shapes and sizes.
B) They are made of different substances.
C) Some are man-made while some are naturally formed.

D) All are made up of plastics.

Answer:D

Solution:A, B, C are true (objects vary in shape, material, and origin).

D) is false because not all are made of plastic (e.g., water, fruits, paper).

JEE ADVANCED LEVEL QUESTIONS

Multi correct answer type:

22. Which among these is not soluble in water:

A) Metal B) Lemon juice C) Wood D) Plastic

Answer:A,C,D

Solution:Lemon juice (B) is soluble in water (forms a homogeneous mixture).

Metal (A), Wood (C), Plastic (D) are insoluble in water.

Metals may react but don't dissolve.

Wood and plastic are hydrophobic (water-repelling).

23. Freshly cut surface of _____ doesnot shine.

A) Cotton B) jute C) iron D) wood

Answer:A,B,D

Solution:Iron (C) is metallic and shines when cut.

Cotton (A), Jute (B), Wood (D) are non-lustrous and do not shine when cut.

Assertion and Reason Type:

A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

B) Both Assertion and Reason are true, but Reason is NOT the correct explanation for Assertion.

C) Assertion is true, but Reason is false.

D) Assertion is false, but Reason is true.

24. Assertion : Materials which can be compressed or scratched easily are called soft.

Reason : The material which can difficult to compress are called hard.

Answer:A

Solution:Soft materials can be easily compressed or scratched (e.g., sponge, cotton).

Hard materials resist compression or scratching (e.g., metal, stone).

Both statements are true and the reason correctly explains the assertion.

25. Assertion : The materials through which objects can be seen but not clearly are known as materials translucent.

Reason : The oily patch on paper are the translucent.

Answer:A

Solution:Translucent materials allow partial light through but don't show clear images (e.g., frosted glass, oily paper).

Oily paper becomes translucent, which supports the definition.

Comprehension Type:

Materials can be classified based on their electrical and thermal conductivity.

Conductivity is a measure of how well a material allows the flow of electricity or heat. Here are the main classifications based on conductivity

26. Materials that will not allow the flow of heat is called

A) Thermal Conductors B) Electrical Insulators

C) Electrical Conductors D) Thermal Insulators

Answer:D

Solution:Thermal insulators (like wood, plastic, rubber) do not allow heat to flow easily.

Thermal conductors (A) allow heat flow (incorrect).

Electrical insulators/conductors (B, C) relate to electricity, not heat (incorrect).

27. Which is the correct example of Thermal Conductors?

A) Copper B) Silver C) aluminum D) All the above

Answer:D

Solution:Copper, silver, and aluminum are all excellent thermal conductors (used in cookware, electronics).

They allow heat to pass through them efficiently.

Matrix Matching :

28. Column-I

Column-II

A) float on the surface of a fluid

B) form a homogeneous solution

C) easy flow of heat

D) do not allow any light to pass through

1) Miscible Liquids

2) Buoyant Materials

3) Opaque Materials

4) Thermal Conductors

Answer:A-2,B-1,C-4,D-3

Solution:

A) float on the surface of a fluid

B) form a homogeneous solution

C) easy flow of heat

D) do not allow any light to pass through

2) Buoyant Materials

1) Miscible Liquids

4) Thermal Conductors

3) Opaque Materials

KEY

TEACHING TASK									
1	2	3	4	5	6	7	8	9	10
B	A	D	D	B	B	C	C	A,B	A,D
11	12	13	14	15	16	17	18	19	
A,C	A,B,D	A	A	D	B	2	3	2	
20									
A-3,B-1,C-4,D-2									
LEARNERS TASK									
1	2	3	4	5	6	7	8	9	10
D	B	D	A	A	B	A	A	B	B
11	12	13	14	15	16	17	18	19	20
A	C,D	C,D	D	B	D	C	D	D	D
21	22	23	24	25	26	27	28		
D	A,C,D	A,B,D	A	A	D	D	A-2,B-1,C-4,D-3		