1. CLASSIFICATION & INTERCONVERSION OF MATTER

SOLUTIONS

TEACHING TASK

JEE MAINS LEVEL QUESTIONS

Mutliple Choice Question Type :

1. What is the primary factor that determines whether a substance exists in a solid, liquid, or gas state at room temperature?
   A) Color B) Density C) Temperature D) Mass

Answer:C

Solution:The state (solid/liquid/gas) depends on the balance between temperature (kinetic energy) and intermolecular forces.

2. In which state of matter do particles have the least amount of energy and are closely packed in a fixed arrangement?
   A) Solid B) Liquid C) Gas D) Plasma

Answer:A

Solution:Solids have minimum energy; particles vibrate in fixed positions.

3. Which of the following best describes the arrangement of particles in a crystalline solid?
   A) Random and disorganized
   B) Tightly packed and orderly
   C) Moving freely with no specific order
   D) Gas-like arrangement

Answer:B

Solution:Crystalline solids (e.g., NaCl) have regular, repeating patterns.

4. What happens to the particles in a solid when it is heated?
   A) They move faster and become more spread out.
   B) They stop moving altogether.
   C) They vibrate more but stay in fixed positions.
   D) They change into a liquid state.

Answer:C

Solution:Heating increases vibrational energy, but particles remain in place until melting.

5. Which property of liquids allows them to take the shape of the container they are in but maintain a constant volume?
   A) Viscosity B) Density C) Surface tension D) Fluidity

Answer:D

Solution:Fluidity enables flow (shape adaptation) while maintaining volume.

6. When a liquid is heated, what happens to the kinetic energy of its particles?
   A) It decreases B) It remains constant
   C) It increases D) It transforms into potential energy

Answer:C

Solution:Heating provides energy, increasing particle motion (kinetic energy).

7. Which of the following statements is true about the behavior of gas particles?
   A) Gas particles are tightly packed together.
   B) Gas particles have a definite shape.
   C) Gas particles are in constant motion.
   D) Gas particles have strong attractive forces between them.

Answer:C

Solution:Gas particles move randomly and rapidly (kinetic theory).

8. Water at room temperature ,above 100°C, below 0°C exist as
   A) Liquid,Solid,Vapour
   B)Liquid, Vapour and Solid
   C) Solid, Liquid, Vapour
   D)Vapour, Liquid , Solid.

Answer:B

Solution:Room temp: Liquid (0°C < T < 100°C).
>100°C: Vapour (gas).
<0°C: Solid (ice).

9. A form of matter has no fixed shape but it has a fixed volume. An example of this form of matter is
   A) Krypton
   B) Kerosene
   C) Carbon steel
   D) Carbon dioxide

Answer:B

Solution: Liquids (e.g., kerosene) adapt to container shape but resist compression.

10. Which one of the following statements is not true?
   A) The molecules in a solid vibrate about a fixed position
   B) The molecules in a liquid are arranged in a regular pattern
   C) The molecules in a gas exert negligibly small forces on each other, except during collisions
   D) The molecules of a gas occupy all the space available

Answer:B

Solution:Only solids have regular patterns; liquids have short-range order only.

11. Particles of matter have .....because they are constantly moving
   A) volume
   B)density
   C) kinetic energy
   D) Heat

Answer:C

Solution:Motion = Kinetic energy (per kinetic molecular theory).

12. Matter may be a gas, a solid, or a liquiD)It can change from one state to another.Which of the following may cause matter to change state?
   A)a change in mass
   B)a change in color
   C)a change in volume
   D)a change in temperature

Answer:D

Solution: Temperature alters particle energy, enabling phase transitions (e.g., melting).

13. Which property of liquids allows them to form droplets and beads on surfaces?
   A) Viscosity
   B) Density
   C) Surface tension
   D) Boiling point

Answer:C

Solution: Surface tension minimizes surface area, causing beading/droplets.

JEE ADVANCED LEVEL QUESTIONS

Mutli Correct Answer Type :

1. Which statement(s) about solids is/are correct?
   A) Solids have a definite shape.
   B) Solids have a definite volume.
   C) Particles in solids are tightly packed.
   D) Solids can flow and take the shape of their container.

Answer:A,B,C

Solution:Solids have fixed shape/volume due to tightly packed particles in a rigid structure.
Flowability is exclusive to liquids/gases.

2. Which of the following statements about liquids is not true?
   A) Liquids have a definite shape.
   B) Liquids have a definite volume.
   C) Particles in liquids are closely packed but can move past each other.
   D) Liquids have no fixed volume or shape.

Answer:A,D

Solution:Liquids lack fixed shape but maintain volume.

3. Select the characteristics that apply to both liquids and gases.
   A) Definite shape
   B) Takes the shape of the container
   C) Definite volume
   D) Particles have more kinetic energy compared to solids

Answer:B,D

Solution:Both flow (shape adaptation) and have higher energy than solids.
Gases lack fixed volume; liquids retain it.

4. Identify the properties that are common to all three states of matter.
   A) Definite volume
   B) Indefinite shape
   C) Particles in constant motion
   D) Fixed arrangement of particles

Answer:C

Solution:All states have moving particles:
Solids: Vibrate in place.
Liquids: Slide past each other.
Gases: Move freely.

Assertion and Reason Type :

5. **Assertion** : The compressibility of gases is much higher than that of liquids.
   Reason : Gas particles are far apart and can be compressed more easily compared to the particles in liquids.

Answer:A

Solution:Assertion (True): Gases are highly compressible due to large intermolecular spaces.
Reason (True & Correct Explanation): The large gaps between gas particles allow significant compression, unlike tightly packed liquids.

6. **Assertion** : The intermolecular forces in liquids are stronger than those in

gases.

Reason : In liquids, particles are closer together than in gases, resulting in stronger attractive forces between them.

Answer:A

Solution:Assertion (True): Liquids have stronger intermolecular forces than gases (but weaker than solids).

Reason (True & Correct Explanation): Proximity of liquid particles increases attractive forces (van der Waals, hydrogen bonds).

7. **Assertion** : Plasma is considered the fourth state of matter.

Reason : Plasma consists of charged particles and occurs at extremely high temperatures, where atoms lose their electrons.

Answer:A

Solution:Assertion (True): Plasma is distinct from solids/liquids/gases.

Reason (True & Correct Explanation): Plasma forms when high temperatures ionize atoms, creating free electrons and ions (e.g., stars, lightning).

8. **Assertion** : In liquids, the particles have more freedom of movement than in solids due to weaker intermolecular forces, allowing them to flow and take the shape of the container.

Reason : The intermolecular forces in liquids are weaker than those in solids.

Answer:A

Solution:Assertion (True): Liquids flow because particles can slide past each other.

Reason (True & Correct Explanation): Weaker forces (vs. solids) enable this mobility.

Statement Type :

9. **Statement I** : Solids cannot be compressed.

Statement II : This is due to compact arrangement of molecules

Answer:A

Solution:Solids cannot be compressed because their particles are tightly packed with very little space between them.This tight or compact arrangement makes solids incompressible.

10. **Statement I** : Molecules in a solid cannot interchange their position

Statement II : Solids have strong intermolecular force of attraction

Answer:B

Solution:Statement I is true because, in solids, molecules vibrate about fixed positions and do not freely move or interchange positions (unlike in liquids or gases).

Statement II is true because solids do have strong intermolecular forces, which hold the molecules in fixed positions.

However, Statement II does not fully explain Statement I. While strong intermolecular forces prevent molecules from moving freely, the inability to interchange positions is more specifically due to the rigid structure of solids, not just the strength of intermolecular forces.

Comprehension Type :

Comprehension -I

11. Which statement accurately describes the arrangement of particles in a solid?
    A) Particles are spaced far apart and move freely.
    B) Particles are closely packed and have a fixed position.
    C) Particles have no definite arrangement.
    D) Particles are closely packed but can slide past each other.

Answer:B

Solution:A) Incorrect. (This describes gases.)
B) Correct. Solids have particles that are closely packed and vibrate in fixed positions.
C) Incorrect. (This describes gases or amorphous solids, but not crystalline solids.)
D) Incorrect. (This describes liquids.)

12. What is a characteristic feature of liquids?
    A) Definite shape and volume
    B) Particles with fixed positions
    C) Ability to take the shape of the container
    D) Particles spaced far apart

Answer:C

Solution:A) Incorrect. (Solids have definite shape and volume.)
B) Incorrect. (Fixed positions describe solids.)
C) Correct. Liquids take the shape of their container while maintaining a fixed volume.
D) Incorrect. (Particles in gases are far apart.)

13. In which state of matter do particles have the highest kinetic energy and are least attracted to each other?
    A) Solid B) Liquid C) Gas D) Plasma

Answer:C

Solution:A) Incorrect. (Solids have low kinetic energy and strong attraction.)
B) Incorrect. (Liquids have moderate kinetic energy and attraction.)
C) Correct. Gases have the highest kinetic energy and weakest intermolecular forces.
D) Incorrect. (Plasma has even higher energy, but it's not among the primary states here.)

14. Which state of matter has particles that vibrate in fixed positions?
    A) Solid B) Liquid C) Gas D) Plasma

Answer:A

Solution:A) Correct. Solids have particles vibrating in fixed positions.
B) Incorrect. (Liquids have particles that can move past each other.)
C) Incorrect. (Gas particles move freely.)
D) Incorrect. (Plasma particles are ionized and move randomly.)

Comprehension -II

15. The first Bose-Einstein condensate was produced using a gas of ..... atoms
    A)Rubidium B)Ruthenium C) Rhodium D) Radium

Answer:A

Solution:The first BEC was created in 1995 using Rubidium (Rb) atoms.

Integer Type :

16. If you heat a solid, how many states does it change into?

Answer:2

Solution:Most solids undergo 2 state changes (solid → liquid → gas).

Matrix Matching Type :

17.**Answer:A-iv,B-ii,C-i,D-iii**

Solution:

Column - I	**Column - II**
A)Bose-Einstein condensate	iv) fifth state of matter.
B)Solids	ii) many no of free surfaces
C)Liquids	i) only one free surface.
D)Gases	iii) no free surfaces

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Mutliple Choice Question Type :

1. What is the characteristic shape of a solid?

A) Takes the shape of the container B) Indefinite shape
C) Definite shape D) Variable shape

Answer:C

Solution:Solids have a fixed shape due to tightly packed particles in a rigid structure. Liquids and gases take the shape of their container (A), while solids do not.

2. In solids, how do particles generally move?

A) Freely B) Along a straight line
C) In a random and chaotic manner D) Particles don't move in solids

Answer:D

Solution:In solids, particles generally move by vibrating in a fixed position; they do not move freely like in liquids or gases. So the correct answer is D) Particles don't move in solids.

3. What term describes the ability of a liquid to flow and take the shape of its container?

A) Rigidity B) Viscosity C) Elasticity D) Fluidity

Answer:D

Solution:Fluidity is the property of liquids to flow.

Viscosity (B) refers to resistance to flow, while rigidity (A) applies to solids.

4. How do particles in liquids behave compared to solids?

A) Fixed positions B) Vibrational motion with fixed positions
C) Move freely D) Condense

Answer:C

Solution:Liquid particles can slide past one another (unlike solids, which vibrate in fixed positions).

5. What happens to the shape of a gas in a container?
A) Takes the shape of the container B) Maintains a definite shape
C) Expands to fill the entire container D) Condenses into a liquid

Answer:C

Solution:Gases have no fixed shape or volume and uniformly fill their container.

6. What best describes the movement of gas particles?
A) Fixed positions B) Vibrational motion with fixed positions
C) Move freely and rapidly D) Fixed volume

Answer:C

Solution:Gas particles have high kinetic energy, moving randomly and colliding with container walls.

7. .....is an ionised gaseous state of matter
A) Solid B) Bose-Einstein C) Liquids D) Plasma

Answer:D

Solution:Plasma is ionized gas (e.g., lightning, stars), distinct from solids/liquids/ gases.

8. Any material which has ..... and occupies ..... is called matter
A) Mass B) Space C) Both A and B D) None

Answer:C

Solution:Any material which has Mass and occupies Space is called matter

9. Which of the following is solid ?
A)Wood B)Stone C) Rock D) All the above.

Answer:D

Solution:All are solids with fixed shapes and volumes.

10. The material with negligible intermolecular forces is ....
A) Solid B) Liquid C)Gas D)Plasma

Answer:C

Solution:Gas particles have weak intermolecular forces, allowing free movement.

11. .....is the fifth state of matter
A) Solid B) Bose-Einstein C) Liquids D) Plasma

Answer:B

Solution:BEC is the fifth state, formed at near absolute zero.

12. The state of matter with no definite shape but have definite volume is .....
A)Gas B)Solid C)Liquid D)None

Answer:C

Solution:Liquids take the container's shape (no fixed shape) but have fixed volume.

13. Matter is made up of tiny particles called
A) Atoms B) Molecules C) Element D) Substance

Answer:A

Solution:Matter is made up of tiny particles called Atoms

JEE MAINS LEVEL QUESTIONS

Mutliple Choice Question Type :

1. Which of the following is the property of Solid?
   A) Can be compressed B) Have definite shape
   C) Have low density D) Intermolecular force is less

Answer:B

Solution:Solids have a fixed shape and volume due to tightly packed particles.

2. Which of the following is a property of both liquids and gases, but not solids?
   A) has definite volume. B) can be compressed
   C) has a definite shape D) has a definite texture

Answer:B

Solution:Liquids and gases are compressible (gases more so than liquids), while solids are nearly incompressible.

3. When a gas undergoes compression, what happens to its particles?
   A) They move farther apart. B) They move closer together.
   C) They stop moving. D) They change into a liquiD)

Answer:B

Solution:Compression reduces the volume, bringing gas particles nearer

4. Why does a helium balloon deflate over time when left in a room?
   A) Helium escapes through the rubber B) The balloon loses its elasticity
   C) Helium undergoes sublimation D) Helium reacts with the air

Answer:A

Solution:Helium atoms are small and diffuse through the balloon's material.

5. Which of the following materials is an example of a good conductor of electricity in the solid state?
   A) Rubber B) Wood C) Copper D) Plastic

Answer:C

Solution:Metals like copper have free electrons that conduct electricity.

6. Which of the following statements about solids is false?
   A) Particles are closely packed.
   B) Solids have a definite shape and volume.
   C) Particles have significant freedom of movement.
   D) Solids resist changes in shape.

Answer:C

Solution:Solid particles only vibrate in fixed positions; they cannot move freely.

7. What causes surface tension in liquids?
   A) High viscosity B) Cohesive forces between liquid molecules
   C) Low density D) Evaporation

Answer:B

Solution:Surface tension arises from strong intermolecular forces at the liquid's surface

8. What happens to the particles in a liquid when it is cooled?
   A) They move faster and become more spread out.
   B) They stop moving altogether.
   C) They vibrate more but stay close together.
   D) They change into a gas state.

Answer:C

Solution:Cooling reduces particle energy, leading to slower movement but maintained proximity.

9. Which of the following statements about liquids is true?
   A) Liquids have a definite shape and volume.
   B) Liquids take the shape of the container but have a constant volume.
   C) Liquids have particles with very little freedom of movement.
   D) Liquids cannot flow.

Answer:B

Solution:Liquids flow to match their container's shape but retain a fixed volume.

10. In which state of matter do particles have more energy than in a solid but less than in a gas?
   A) Solid B) Liquid C) Gas D) Plasma

Answer:B

Solution:Energy order: Solid < Liquid < Gas < Plasma.

JEE ADVANCED LEVEL QUESTIONS

Mutli Correct Answer Type :

1. Choose the incorrect statement
   A)Solids has no definite shape B)Solids do not need a container to hold them.
   C) Solids have no definite volume D)Solids do not expand on heating

Answer:A,C,D

Solution:Solids have both definite shape and volume due to their rigid, closely packed structure.

Option B is correct: Solids maintain their shape without a container (unlike liquids/ gases).

Solids do expand on heating:

Like all matter, solids expand when heated. As the temperature increases, the particles in the solid vibrate more, causing them to spread out slightly and occupy a slightly larger volume.

2. Which of the following is true about gases?
   A) Gases have no definite volume
   B) Gases have no free surface
   C)Gases have no definite shape.
   D)Gases are highly compressible

Answer:A,B,C,D

Solution:Gases fill their container entirely, so they lack definite shape/volume (A, C). They form no free surfaces (B) because particles disperse uniformly.

High compressibility (D) arises from large intermolecular spaces.

Assertion and Reason Type :

3. **Assertion** : Solids have a definite shape and volume.
   Reason : The particles in a solid are closely packed and have a fixed position.

Answer:A

Solution:Assertion (True): Solids indeed have a definite shape and volume due to their rigid structure.

Reason (True): This is because the particles in solids are tightly packed in a fixed arrangement, allowing only vibrational motion.
Correct Explanation: The reason correctly explains why solids have definite shape and volume.

4. **Assertion** : The particles in a gas are more tightly packed than those in a liquid.
   Reason : In a gas, particles have more kinetic energy, resulting in greater separation between them.

Answer:D

Solution:Assertion (False): Gas particles are actually much farther apart compared to liquids (liquids have closer packing).
Reason (True): Gases have higher kinetic energy, which keeps particles widely separated.

5. **Assertion** : The compressibility of gases is much higher than that of liquids.
   Reason : Gas particles are far apart and can be compressed more easily compared to the particles in liquids.

Answer:A

Solution:Assertion (True): Gases are highly compressible, unlike liquids.
Reason (True): The large intermolecular spaces in gases allow easy compression.

Comprehension Type :

6. What gives solids a definite shape and volume?
   A) Free movement of particles
   B) Closely packed particles with fixed arrangement
   C) Particles far apart and moving freely
   D) Lack of attraction between particles

Answer:B

Solution:Solids maintain their shape/volume because particles are tightly packed in a rigid structure and only vibrate in place.

7. What allows liquids to take the shape of their container?
   A) Fixed arrangement of particles B) Closely packed particles
   C) Freedom of movement for particles D) Rapid vibration of particles

Answer:C

Solution:Liquid particles can slide past one another (though still close together), enabling them to flow and adapt to the container's shape.

8. Which state of matter has neither a definite shape nor a definite volume?
   A) Solid B) Liquid C) Gas D) Plasma

Answer:C

Solution:Gases expand to fill their container completely, lacking fixed shape or volume.

9. In which state do particles have the most freedom to move?
   A) Solid B) Liquid C) Gas D) Plasma

Answer:C

Solution:Gas particles move freely and rapidly due to weak intermolecular forces and large spaces between them.

10. What is a characteristic of gases?
A) Fixed shape and volume B) Closely packed particles
C) Far apart particles with free movement D) All the above

Answer:C

Solution:Gases are defined by their low density, high compressibility, and particles that are widely spaced and move randomly.

11. Which state of matter do not settle to the bottom of container
A)Solids B)Liquids C) Gases D)All

Answer:C

Solution:Gases disperse uniformly throughout their container (no settling), unlike solids (settle) or liquids (form a surface).

Integer Type :

12. Among solid, liquid and gas how many of them can flow.....

Answer:2

Solution:Liquids (e.g., water) and gases (e.g., air) can flow due to particle mobility.
Solids (e.g., ice) cannot flow (rigid structure).

13. Among milk ,water,ice,oxygen . How many are solids?.....

Answer:1

Solution:Ice (solid state of water).
Others: Milk (liquid), water (liquid), oxygen (gas at room temperature).

14. Rubidium atoms turns to super cooled liquid at ..... nanokelvin temperature

Answer:170

Solution:Rubidium atoms turn to a supercooled liquid (Bose-Einstein Condensate) at approximately 100 nanokelvin (nK)

15. Among balloon, sponge and scale, how many of them can be compressed?

Answer:2

Solution:Balloon (contains compressible gas).
Sponge (porous structure allows compression).
Scale (rigid solid; negligible compressibility).

Matrix Matching Type :

16.**Answer:A-ii,B-iv,C-i,D-iii**

Solution:

Column - I	**Column - II**
A)Solids	ii) wood
B)Liquids	iv) kerosene
C)Gases	i) steam
D)Plasma	iii) ions and electyrons co-exist

KEY

				Teaching Task					
				JEE MAINS LEVEL QUESTIONS					
1	2	3	4	5	6	7	8	9	10
C	A	B	C	D	C	C	B	B	B
11	12	13							
C	D	C							
				JEE ADVANCED LEVEL QUESTIONS					
1	2	3	4	5	6	7	8	9	10
A,B,C	A,D	B,D	C	A	A	A	A	A	B
11	12	13	14	15	16	17			
B	C	C	A	A	2	A-iv,B-ii,C-i,D-iii			
				Learners Task		(CUQ'S)			
1	2	3	4	5	6	7	8	9	10
C	D	D	C	C	C	D	C	D	C
11	12	13							
B	C	A							
				JEE MAINS LEVEL QUESTIONS					
1	2	3	4	5	6	7	8	9	10
B	B	B	A	C	C	B	C	B	B
				JEE ADVANCED LEVEL QUESTIONS					
1	2	3	4	5	6	7	8	9	10
A,C,D	A,B,C,D	A	D	A	B	C	C	C	C
11	12	13	14	15	16				
C	2	1	170	2	A-ii,B-iv,C-i,D-iii				

TEACHING TASK

JEE MAINS LEVEL QUESTIONS

Mutliple Choice Question Type :

1. Matter is made up of one kind of particles is called .....
   A) Substance B)Mixture C)Element D)Compound

Answer:C

Solution:An element consists of identical atoms (e.g., gold, oxygen).

2. The temperature at which liquid changes to solid is known as .....
   A)Condensation point B)Freezing point
   C)Melting point D)Boiling point

Answer:B

Solution:The temperature at which liquid changes to solid is known as Freezing point
Example: Water → Ice at 0°C.

3. The temperature at which the solid starts melting is called
   A)Boiling point B)Freezing point
   C)Melting point D)Sublimating point

Answer:C

Solution:The temperature at which the solid starts melting is called Melting point

4. What are the properties of matter?
   A) No mass but occupies space. B) Mass but occupies no space.
   C) Mass and occupies space. D) No mass and occupies no space

Answer:C

Solution:Matter have Mass and occupies space.

5. Ice needs ___ to convert into water.
   A) bucket B) heat
   C) steam D)None of the above

Answer:B

Solution:Melting requires thermal energy (endothermic process).

6. $\text{Water} \xrightarrow[\text{Temperature}]{\text{Rise in}} \text{Water vapour}$ The above reaction is ?
   A) Evaporation B) Condensation C) Precipitation D) Freezing

Answer:A

Solution: $\text{Water} \xrightarrow[\text{Temperature}]{\text{Rise in}} \text{Water vapour}$ The above reaction is Evaporation.

7. Shiela made a cup of tea for herself. But her phone rang and she started talking on the phone. In the mean while she covered her mug of tea with a lid. After ten minutes, she removed the lid to drink tea. She observed small water droplets on the inner side of the lid. Now which process is shown in the above paragraph?
   A) Melting B) Precipitation C) Evaporation D) Condensation

Answer:D

Solution:Water vapor (gas) → Liquid droplets due to cooling on the lid.

8. Which of the following is true ?

A) Water $\xrightarrow{heat}$ Steam $\xrightarrow{heat}$ Ice

B) Water $\xrightarrow{cool}$ Ice $\xrightarrow{cool}$ Steam

C) Steam $\xrightarrow{cool}$ Water $\xrightarrow{cool}$ Ice

D) Steam $\xrightarrow{heat}$ Ice $\xrightarrow{cool}$ Water

Answer:C

Solution: Steam $\xrightarrow{cool}$ Water $\xrightarrow{cool}$ Ice

9. Solid which undergoes sublimation is

A)Argon B) Iodine C)Sodium chloride D)Water

Answer:B

Solution: Iodine Sublimes directly from solid to gas

10. Solid to Liquid : Melting :: _____ : Freezing

A) Gas to Liquid B) Liquid to Gas

C) Solid to Gas D) Liquid to Solid.

Answer:D

Solution:Freezing is the reverse of melting (Liquid → Solid).

JEE ADVANCED LEVEL QUESTIONS

Mutli Correct Answer Type :

11. Sublimable solids are

A) Water B) Common salt C)Iodine D)Naphthalene.

Answer:C,D

Solution:Sublimation is the direct transition from solid to gas without passing through the liquid phase.

Iodine (C): Sublimes at room temperature (forms purple vapor).

Naphthalene (D): Used in mothballs; sublimes easily.

12. conversion of matter to various forms depends on....

A) Temperature B)Volume C)Pressure D) Mass

Answer:A,C

Solution:Temperature (A): Determines energy of particles (e.g., melting, boiling).

Pressure (C): Affects phase transitions (e.g., high pressure can liquefy gases, low pressure promotes sublimation).

Statement Type :

13. **Statement I** : Solids do not diffuse.

Statement II : There are strong intermolecular force of attractions

Answer:B

Solution:Statement I (True): Solids do not diffuse (their particles vibrate in fixed positions; no free movement).

Statement II (True): Solids have strong intermolecular forces, which restrict particle movement.

Explanation:While Statement II is true, it does not directly explain why solids don't diffuse. Diffusion is primarily due to lack of particle mobility, not just intermolecular

forces.

14. **Statement I** : Substances containing particles of only one kind are called Pure substances.
Statement II : Sodium chloride is sublimable solid.

Answer:C

Solution:Statement I (True): Pure substances (elements/compounds) consist of identical particles (e.g., gold, NaCl).
Statement II (False): Sodium chloride (NaCl) does not sublime; it melts at high temperatures. Sublimable solids include iodine or dry ice.

Comprehension Type :

Comprehension -I :

Matter changes its state from one form to another by changing temperature and pressure.

15. On heating ice changes to .....
A)Liquid B)Solid C) Gas D)Plasma.

Answer:A

Solution:Ice (solid state of water) melts into liquid water when heated.

Comprehension -II :

16. The combination of two or mor elements in any ratio is called....
A)Compound B)Element C)Mixture D)Matter.

Answer:C

Solutin:Mixtures combine elements or compounds without fixed ratios (e.g., air, saltwater).

Integer Type :

17. Freezing point of water is .....°C.

Answer:0

Solution:Water freezes into ice at 0°C under standard pressure (1 atm).

18. Boiling point of water is .....°C.

Answer:100

Solution:Water boils and turns to steam at 100°C under standard pressure (1 atm).

Matrix Mtaching Type :

19. **Answer:A-ii,B-iii,C-iv,D-i**

Solution:

Column - I	**Column - II**
A.Solid	ii. do not diffuse
B.Liquid	iii. acquire shape of container.
C.Gases	iv. highly compressible.
D.Pure substances	i. only one kind of particles.

20. **Answer:A-iii,B-iv,C-i,D-ii**

Solution:

Column - I	**Column - II**
A. Liquid to Solid	iii. Freezing
B.Vapour to Liquid	iv. Condensation.
C. Solid to Liquid	i.Melting
D. Liquid to Vapour	ii.Vapourisation

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Mutliple Choice Question Type :

1. Which of the following are types of matter based on physical classification?
   A) Solids B)Liquids C)Gases D)All.

Answer:D

Solution:Matter is physically classified into these three states.

2. A substance which is formed by chemical combination of two or more elements in a fixed ratio is called....
   A)Atom B) Compound C)Mixture D)Element.

Answer:B

Solution:Compounds have fixed compositions (e.g., H_2O). Mixtures (C) have variable ratios.

3. The conversion of a liquid to solid on cooling is called.....
   A)Boiling B)Melting C) Freezing D)Condensation.

Answer:C

Solution: The conversion of a liquid to solid on cooling is called Freezing

4. The process by which liquid converts to gas is called .....
   A)Vapourisation B)Melting C)Freezing D)Cooling.

Answer:A

Solution:The process by which liquid converts to gas is called Vaporization

5. Melting point of ice is .....
   A)0°C B)20 °C C)100 °C D)75°C

Answer:A

Solution:Ice melts to water at 0°C under standard pressure.

6. Boiling point of water is .....
   A)0°C B)20 °C C)10 °C D)100°C

Answer:D

Solution:Water boils at 100°C (1 atm pressure).

7. ..... cannot diffuse.
   A)Solids B)Liquids
   C)Gases D)None of the above.

Answer:A

Solution:Solid particles vibrate in fixed positions; no free movement to diffuse.

8. which of the following are sublimable in nature?
   A)Camphor B)Naphthalene C)Iodine D) All the above.

Answer:D

Solution:All three (Camphor, Naphthalene, Iodine)sublime (solid → gas directly).

9. The process of converting solid directly to gas without liquid state is called.....
   A)Melting B)Sublimation C)Condensation D)Freezing.

Answer:B

Solution:The process of converting solid directly to gas without liquid state is called Sublimation

10. Matter is made up of smaller particles are called....
A) Molecules B)Compound C)Mixture D)Pure substance.

Answer:A

Solution:Molecules are the smallest units of matter retaining chemical properties (atoms for elements).

JEE MAINS LEVEL QUESTIONS

Mutliple Choice Question Type :

1. .....melts to form water.
A)Ice B)Solid C)Gas D)Substance.

Answer:A

Solution:Ice is the solid state of water; it melts at 0°C to form liquid water.

2. The molecules of .....have large space between them.
A)Solid B)Liquid C)Gases D)Substance.

Answer:C

Solution:Gas particles are far apart with weak intermolecular forces

3. ..... state of matter is incompressible.
A)Solid B)Liquid C)Gas D)Plasma.

Answer:A

Solution:Solids are nearly incompressible due to tightly packed particles.

4. The temperature at which solid changes to liquid is called.....
A)Melting point B)Boiling point C)Evaporation D)Condensation

Answer:A

Solution:The temperature at which solid changes to liquid is called Melting point

5. Find the odd one out.
A) Wood B) Brick C) Book D) Milk

Answer:D

Solution:Wood, brick, and book are solids; milk is a liquid.

6. Which of the following does not take the shape of the container it is in?
A) A pen B) Oil C) Water D) None of these

Answer:A

Solution:A pen is a solid and retains its shape, unlike liquids (oil, water) or gases

7. During which state will the shape of the matter take on the shape of the area/ container?
A) Solids B) Liquids C) Gases D) None of these.

Answer:C

In the gaseous state, particles are far apart and move freely in all directions. This allows gases to not only fill the volume of any container but also take its entire shape. Liquids also take the shape of their container, but only the shape of the part they occupy, not the full volume—gases go all the way!

8. We can melt solids by the process of _____.

A) cooling B) heating
C) both (a) and (b) D) None of the above

Answer:B

Solution:Melting requires heat energy to overcome intermolecular forces.

9. Particles of matter moves faster due to high _____
A)Energy B)Mass C)Color D)Weight

Answer:A

Solution:Higher energy (e.g., thermal) increases particle kinetic energy.

10. Which of the following is a property of diffusion?
A) Slowest in liquids B) Fastest in gases
C) Based on motion of particles D) All of the above.

Answer:D

Solution:Diffusion is:
Slowest in liquids (compared to gases).
Fastest in gases (due to free movement).
Driven by particle motion (kinetic theory).

JEE ADVANCED LEVEL QUESTIONS

Mutli Correct Answer Type:

11. Sublimable solids are
A) Water B) Common salt C)Iodine D)Naphthalene.

Answer:C,D

Solution:Sublimation is the process where a solid changes directly into gas without becoming liquid.
Iodine and Naphthalene are classic examples of sublimable solids.

12. The temperature at which solid converts to liquid and vice-versa is called
A)Melting point B)Boiling point
C)Freezing point D)Condensation point.

Answer:A,C

Solution:Melting Point: Temperature at which solid → liquid
Freezing Point: Temperature at which liquid → solid

Comprehension Type :

Comprehension -I :

13. The process of converting liquid to vapour at a particular temperature is called
A)Melting B)Boiling C)Condensation D)Freezing.

Answer:B

Solution:Boiling is the process where a liquid changes to vapour at its boiling point.

Comprehension - II :

14. The substance which contain atoms of only one kind is called....
A) Molecule B)Atom C)Pure substance D)Mixture

Answer:C

Solution:A pure substance that contains only one kind of atom is typically an element.

Integer Type :

15. Based on physical classification, matter is of ..... types.

Answer:5

Solution:Matter exists in five states :

1.Solids 2. Liquids 3.Gases 4. Plasma 5.Bose-Einstein condensate.

16. Among Iodine,Naphthalene ,ice . how many are sublimable in nature?.....

Answer:2

Solution:Iodine and naphthalene sublime at room temperature, while ice melts into water before vaporizing.

17. Among wood, air, perfume, how many can diffuse easily?.....

Answer:2

Solution:Air (gases) and perfume (vapors) diffuse easily, while wood (a solid) does not.

KEY

				TEACHING TASK					
				JEE MAINS LEVEL QUESTIONS					
1	2	3	4	5	6	7	8	9	10
C	B	C	C	B	A	D	C	B	D
				JEE ADVANCED LEVEL QUESTIONS					
11	12	13	14	15	16	17	18	19	
C,D	A,C	B	C	A	C	0	100	A-ii,B-iii,C-iv,D-i	
20									
A-iii,B-iv,C-i,D-ii									
				LEARNERS TASK					
				CUQ's					
1	2	3	4	5	6	7	8	9	10
D	B	C	A	A	D	A	D	B	A
				JEE MAINS LEVEL QUESTIONS					
1	2	3	4	5	6	7	8	9	10
A	C	A	A	D	A	C	B	A	D
				JEE ADVANCED LEVEL QUESTIONS					
11	12	13	14	15	16	17			
C,D	A,C	B	C	5	2	2			