* **Choose the correct alternative from those given below question** [23]

1. The primary difference between solids and liquids is that the constituent particles are:
   (A) closely packed in solids, while they are stationary in liquids.
   (B) far apart in solids and have fixed positions in liquids.
   (C) always moving in solids and have a fixed position in liquids.
   (D) closely packed in solids and move past each other in liquids.

   **Ans. :** (D) closely packed in solids and move past each other in liquids.

2. Which of the following is the basic unit of matter?
   (A) Molecule (B) Atom (C) Element (D) Compound

   **Ans. :** (B) Atom

3. Which of these is NOT a form of matter?
   (A) Solid (B) Liquid (C) Energy (D) Gas

   **Ans. :** (C) Energy

4. Which of the following is true about matter?
   (A) It occupies space (B) It has mass
   (C) It is made up of particles (D) All of the above

   **Ans. :** (D) All of the above

5. Which statement is correct about atoms and molecules?
   (A) Atoms are larger than molecules
   (B) Molecules are smaller than atoms
   (C) Molecules are made of atoms
   (D) Atoms are made of molecules

   **Ans. :** (C) Molecules are made of atoms

6. The particles of matter are
   (A) Stationary
   (B) Invisible and always moving
   (C) Not attracted to each other
   (D) Fixed in space

   **Ans. :** (B) Invisible and always moving

7. When sugar dissolves in water, it shows:
   (A) Sugar disappears

(B) Particles are stationary

(C) Matter is continuous

(D) Matter is made up of particles

**Ans. :** (D) Matter is made up of particles

8. When two gases are mixed, they:

(A) Settle at the bottom

(B) Do not mix

(C) Diffuse into each other

(D) React to form liquid

**Ans. :** (C) Diffuse into each other

9. How many main physical states of matter are there?

(A) Two (B) Three (C) Four (D) Five

**Ans. :** (B) Three

10. Which of the following is NOT a state of matter?

(A) Solid (B) Liquid (C) Vapour (D) Gas

**Ans. :** (C) Vapour

11. The interparticle space is maximum in:

(A) Solids (B) Liquids (C) Gases (D) All are equal

**Ans. :** (C) Gases

12. Which of these has the least interparticle space?

(A) Air (B) Water (C) Wood (D) Steam

**Ans. :** (C) Wood

13. The arrangement of particles in solids is:

(A) Loose and irregular

(B) Tightly packed and fixed

(C) Random and moving freely

(D) Widely spaced

**Ans. :** (B) Tightly packed and fixed

14. Liquids flow easily because:

(A) Particles are fixed

(B) Interparticle space is zero

(C) Interparticle space is moderate

(D) Particles do not move

**Ans. :** (C) Interparticle space is moderate

15. Particles in a gas move:

(A) Slowly in fixed positions

(B) Randomly and rapidly in all directions

(C) Not at all

(D) Only in one direction

**Ans. :** (B) Randomly and rapidly in all directions

16. In solids, the movement of particles is:

(A) Very fast

(B) Freely in all directions

(C) Vibrational at fixed positions

(D) Rotational

**Ans. :** (C) Vibrational at fixed positions

17. Which statement is correct? If we add sugar to water, the volume of the solution

(A) Increases

(B) Decreases

(C) Remains constant

(D) First increase, then decrease

**Ans. :** (D) First increase, then decrease

18. When the same volume of liquid is poured into containers of different shapes, which parameter changes?

(A) Volume (B) Shape (C) Size (D) Structure

**Ans. :** (B) Shape

19. Vibration happens between molecules of which state of matter:

(A) Solid (B) Liquid (C) Semi-solid (D) Gas

**Ans.:** (A) Solid

20. The temperature at which a solid starts changing into a liquid state is

(A) Freezing point (B) Melting point (C) Boiling point (D) Critical point

**Ans. :** (B) Melting point

21. The maximum interparticle space is present in

(A) Solid (B) Liquid (C) Gas (D) All of these

**Ans. :** (C) Gas

22. Assertion (A): The physical state of a substance depends on the arrangement and movement of its particles.
Reason (R): Solids have the least interparticle spacing and particles vibrate in fixed positions, while gases have maximum spacing and move freely in all directions.

(A) Both (A) and (R) are true, and (R) is the correct explanation of (A).

(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

**Ans.:** (A) Both (A) and (R) are true, and (R) is the correct explanation of (A).

23. Assertion (A): Gases can be compressed easily as compared to solids and liquids.
Reason (R): The particles in gases are closely packed with very little inter-particle space.

(A) Both (A) and (R) are true, and (R) is the correct explanation of (A).

(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

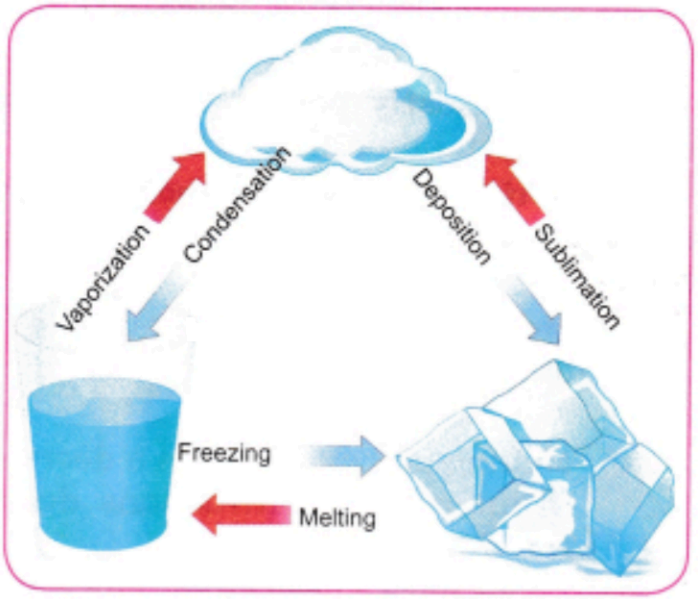
(D) (A) is false, but (R) is true.

**Ans. :** (C) (A) is true, but (R) is false.

*** Answer the following as requested in detail.** **[5]**

24. Represent diagrammatically the changes in the arrangement of particles as ice melts and transforms into water vapour.

**Ans. :** As ice melts into water and then vaporizes into steam, the arrangement of water particles changes significantly. Initially, in ice (a solid), water molecules are tightly packed in a fixed, crystalline structure with limited movement (vibrations). As ice melts, the particles gain kinetic energy, breaking free from their fixed positions and becoming able to slide past each other, forming liquid water. Further heating increases the kinetic energy, causing the particles to move more rapidly and spread out, eventually breaking free from the liquid and becoming water vapour, a gas with particles moving randomly and freely.




Ice (Solid)

• Arrangement: Water molecules are tightly packed in a regular, crystalline structure.

• Movement: Molecules vibrate in fixed positions

Liquid Water

• Arrangement: Molecules are closer together than in a gas, but not in a regular structure. They can move around and slide past each other.

• Movement: Molecules can move around and slide past each other.

Water Vapor (Gas)

• Arrangement: Molecules are far apart and move randomly and freely in all directions.

• Movement: Molecules move rapidly and randomly, colliding with each other and the container walls.

*** Fill in the blanks:** **[10]**

25. Matter is made up of very tiny _____

**Ans. :** Particles

26. These tiny particles can be _____ or _____

**Ans. :** Atoms, Molecules

27. The three states of matter are _____, _____, and _____

**Ans. :** Solid, Liquid, Gas

28. The particles in a solid are packed very _____

**Ans. :** Closely

29. The particles in a gas are _____ apart.

**Ans. :** Far

30. Particles move the slowest in _____

**Ans. :** Solids

31. Particles move the fastest in _____

**Ans. :** Gases

32. _____ take the shape of container but have fixed volume.

**Ans. :** Liquid

33. In _____ particles moves in random direction.

**Ans. :** Gases

34. _____ effects how fast molecules moves.

**Ans. :** Temperature

*** Answer the following questions in short.** **[56]**

35. Choose the correct answer with justification. If we could remove all the constituent particles from a chair, what would happen?

(i) Nothing will change.

(ii) The chair will weigh less due to lost particles.

(iii) Nothing of the chair will remain.

**Ans. :** (iii) Nothing of the chair will remain.

Justification: A chair is made up of constituent particles (atoms and molecules). If

you remove all the particles from the chair, there is nothing left to form the structure, shape, weight, or existence of the chair.

36. 1. Light an incense stick in one corner of the room.

*Burning of an incense stick*

2. Wait for a few minutes and observe.
3. Do you notice the fragrance from a distance?

**Ans. :** Observations:

• We can smell the fragrance of an incense stick from one corner.

• Slowly, the fragrance of this incense stick can be smelled all around the room.

Conclusions:

• The smell of an incense stick can be observed throughout the room because the particles of air are moving randomly.

• As the interparticle forces are weak, they can move freely around the room.

37. Is every speck of this fine chalk powder still composed of the same substance, or has it changed into something else on breaking or grinding?

**Ans. :** Yes, even after breaking or grinding, each speck of chalk powder (fine-grinded) is the same as the previous state because this change is a physical change in which only the size of chalk changes, not any chemical change occurred.

38. Are the units of chalk obtained in this manner considered the smallest units of chalk?

**Ans. :** No, the obtained units of chalk in the process of grinding are not the smallest unit. Every unit of chalk is even consists of constituent particles, which are the basic units of chalk.

39. Do gases also have a fixed volume?

**Ans. :** No, gases don't have a fixed shape or volume. The volume of gas changes with the amount of closeness of particles or the interparticle attraction between particles.

40. Why do gases mix easily, while solids do not?

**Ans. :** Gas particles are far apart from each other, and that's why they move very fast in all directions. Gases have weak intermolecular forces, so they don't attach. Due to this reason, gas particles spread easily around other particles.

41. In which of the three states of matter – solids, liquids, or gases is the movement of atoms about their own position? Give a reason for the same.

**Ans. :** Movement in solids is about their own position. The reason for this is that the inter-particle space is minimum in solids, as a result, particles are closely packed and hence movement of atoms or molecules is about their own position.

42. What factors decide the state of matter of a substance?

**Ans. :** The state of matter is influenced by temperature, pressure, and intermolecular forces.
For example, heating a solid increases particle energy, which may lead to a change in state.

43. How do intermolecular forces differ in solids, liquids, and gases?

**Ans. :** - In solids, intermolecular forces are the strongest, keeping particles tightly bound in fixed positions.
- In liquids, these forces are weaker, allowing particles to move around while remaining close.
- In gases, intermolecular forces are negligible, so particles move freely and independently.

44. escribe the motion of particles in solids, liquids, and gas

**Ans. :** In solids, particles vibrate in fixed positions due to strong intermolecular forces. In liquids, particles have more energy and slide past each other. In gases, particles move rapidly in all directions, as forces are very weak and energy is high.

45. State which of the three states of matter, i.e., solids, liquids, or gases, has
(a) No definite volume
(b) A definite shape
(c) High density
(d) No free surfaces
(e) Particles that diffuse very easily.

**Ans. :** (a) No definite volume – gases
(b) A definite shape – solids
(c) High density – solids
(d) No free surfaces – gases
(e) Particles which diffuse very easily – gases

46. Describe the motion of particles in solids, liquids, and gases.

**Ans. :** - In solids, particles vibrate in fixed positions due to strong intermolecular forces.

- In liquids, particles have more energy and slide past each other.
- In gases, particles move rapidly in all directions, as forces are very weak and energy is high.

47. What causes matter to change its state?

**Ans. :** self

48. Which state of matter has the highest kinetic energy?

**Ans. :** self

49. Which state of matter flows and takes the shape of its container?

**Ans. :** self

50. What happens to particles of a solid when heated?

**Ans. :** self

51. Is air a form of matter?

**Ans. :** self

52. Why do gases have more inter-particle space than solids?

**Ans. :** self

53. What is the role of temperature in changing the state of matter?

**Ans. :** self

54. How is the arrangement of particles different in liquids and gases?

**Ans. :** self

55. What happens to interparticle forces when a solid melts?

**Ans. :** self

56. Explain how the particles are arranged in a liquid.

**Ans. :** self

57. Describe how interparticle spacing and movement differ in solids, liquids, and gases.

**Ans. :** self

58. Compare the motion of particles in the three states of matter with examples.

**Ans. :** self

59. Describe the arrangement and movement of particles in a solid and compare it with a gas.

**Ans. :** self

60. How do interparticle forces vary between solids, liquids, and gases?

**Ans. :** self

61. Explain how and why a solid changes to a liquid and then to a gas.

**Ans. :** self

62. Why do gases expand to fill any container while solids do not?

**Ans. :** self

*** State whether the following sentences are true or false. Correct the false sentences and rewrite them.** [21]

63. Melting ice into water is an example of the transformation of a solid into a liquid.

**Ans. :** true: Melting ice into water is an example of the transformation of a solid into a liquid.

64. The melting process involves a decrease in interparticle attractions during the transformation.

**Ans. :** true: The Melting process involves a decrease in interparticle attraction during the transformation.

65. Solids have a fixed shape and a fixed volume.

**Ans. :** true: Solids have a fixed shape and a fixed volume.

66. The interparticle interactions in solids are very strong, and the interparticle spaces are very small.

**Ans. :** true: The interparticle interactions in solids are very strong, and the interparticle spaces are very small.

67. When we heat camphor in one corner of a room, the fragrance reaches all corners of the room.

**Ans. :** true: When we heat camphor in one corner of a room, the fragrance reaches all corners of the room.

68. On heating, we are adding energy to the camphor, and the energy is released as a smell.

**Ans. :** false: The correct statement is: On heating, energy is added to camphor, causing it to undergo sublimation. The camphor directly converts into gas, and the vapour carries its characteristic smell.

69. All matter is made up of tiny particles.

**Ans. :** true

70. Particles of matter are visible to the naked eye.

**Ans. :** false

71. The spaces between particles are the same in all states of matter.

**Ans. :** false

72. Matter is anything that has mass and occupies space.

**Ans. :** true

73. Water is not considered matter because it flows.

**Ans. :** false

74. Solid, liquids, and gases are all composed of particles.

**Ans. :** true

75. Atoms and molecules are the smallest units of matter.

**Ans. :** true

76. Temperature and pressure determine the state of matter.

**Ans. :** true

77. Gases have no fixed shape but have fixed volume.

**Ans. :** false

78. In solids, particles vibrate but remain in their fixed position.

**Ans. :** true

79. Liquids have fixed volume but take the shape of the container.

**Ans. :** true

80. The particles in a gas are tightly packed and cannot move freely.

**Ans. :** false

81. The boiling point of a substance is the temperature at which it starts to boil.

**Ans. :** false

82. In reference to air pollution, the term is Suspended Particulate Matter (SPM).

**Ans. :** true

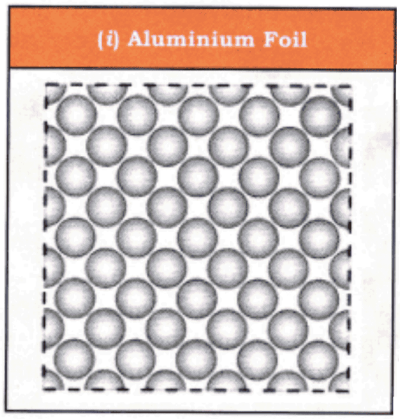
83. All three states of matter can co-exist at a time for any substance.

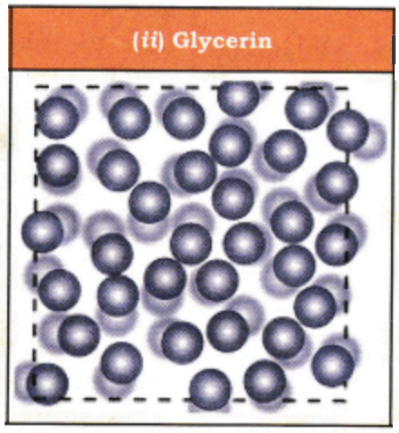
**Ans. :** true

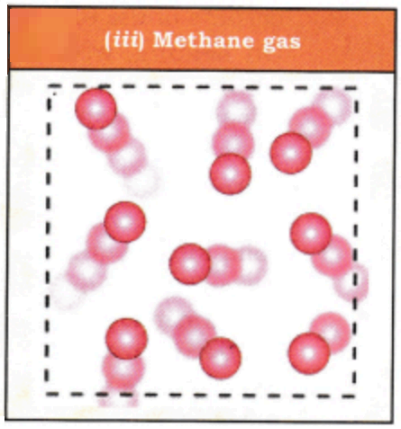
*** Answer the following questions in short.** **[24]**

84. Draw a picture representing particles present in the following:
(i) Aluminium foil
(ii) Glycerin
(iii) Methane gas

**Ans. :** Pictorial representation of particles of Aluminium foil, Glycerin, and Methane gas.




85. Sugar and sand are both solids. Why does sugar dissolve in water, but sand does not?

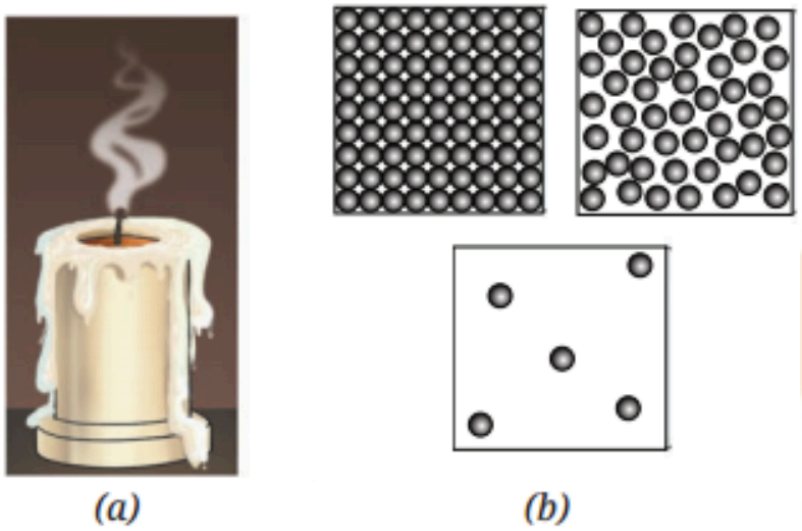
**Ans. :** Sugar particles are solid, but they dissolve in water and occupy some space between the water molecules. Because water can break down sugar particles, which reduces the total volume of the mixture. Whereas sand particles have a rigid crystal structure, which cannot be broken down by water molecules, and hence settle down in water and increasing the total volume.

86. When spilled on the table, milk in a glass tumbler flows and spreads out, but the glass tumbler stays in the same shape. Justify this statement.

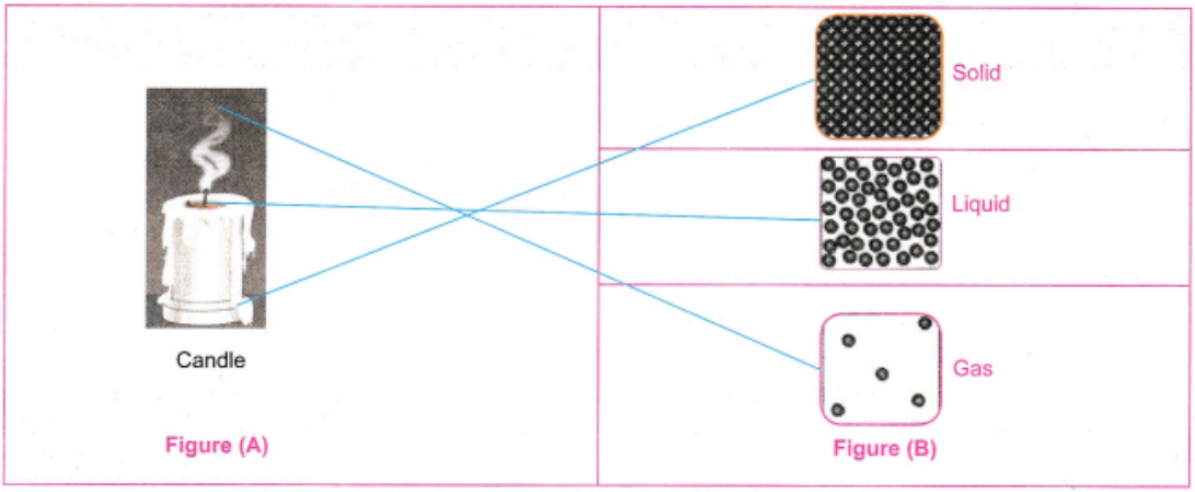
**Ans. :** In this case, milk is spilled on the table, and it spreads around the table because its state is liquid. Liquids can take the shape of their surrounding because their molecules are free to move. This is the reason the milk flows around the table.

Whereas the glass tumbler's shape does not change because it is a solid. In solids, the molecules are closely packed.

87. Observe figure (A), which shows the image of a candle that was just extinguished after burning for some time. Identify the different states of wax in the figure and match them with figure B, showing the arrangement of particles.




**Ans. :** Different states of wax




88. Why does the water in the ocean taste salty, even though the salt is not visible? Explain.

**Ans. :** Ocean water tastes salty because it contains a high concentration of dissolved salts, primarily sodium chloride (common table salt). These salts are not visible because they are dissolved at a molecular level, meaning the individual salt molecules are dispersed throughout the water, making it appear clear.

89. Grains of rice and rice flour take the shape of the container when placed in different jars. Are they solids or liquids? Explain.

**Ans. :** Grains of rice and rice flour are considered solids, despite appearing to take the shape of their container. This is because each grain retains its shape and volume, even when mixed. The "flowing" behavior is due to the ability of these small, irregularly shaped particles to move past each other with minimal friction.

90. Differentiate the terms atoms, molecules, and ions.

**Ans. :**

| Atom | Molecules | Ions |
|---|---|---|
| An atom is the smallest particle of an element that can take part in a reaction. It is the basic unit of matter. Examples: $O, H, CI$ | A molecule is the smallest particle of a substance that retains the characteristics of the substance. Examples: $O_2, H_2, Cl_2$ | An ion is any atom or a group of atoms that has a resultant charge due to loss or gain of electrons. Examples: $O^{2-}, H^{1+}, Cl^{1-}$ |

91. State in which of the following examples, i.e., a piece of wood, water, or a light gas, is the
(a) Inter-particle space maximum
(b) Inter-particle attraction maximum
(c) Energy possessed by particles of matter, very large.

**Ans. :** (a) Inter-particle space maximum – a light gas,
(b) Inter-particle attraction maximum – a piece of wood,
(c) Energy possessed by particles of matter, very large – a light gas

*** Answer the following questions in on sentence** **[7]**

92. Name the three main states of matter.

**Ans. :** Solid, Liquid, and Gas.

93. What determines the different states of matter?

**Ans. :** Interparticle spacing and the energy of particles.

94. Which state of matter has the least interparticle space?

**Ans. :** Solid state.

95. In which state do particles move freely and rapidly?

**Ans. :** Gaseous State.

96. Define 'particulate nature of matter'.

**Ans. :** The particulate nature of matter means that all matter is made up of tiny particles. These particles are constantly moving and have space between them.

97. How does temperature affect the state of matter?

**Ans. :** Increasing temperature gives particles more energy, which can change solids to liquids and liquids to gases.

98. What is the significance of interparticle spacing in matter?

**Ans. :** Interparticle spacing affects properties like shape, volume, and compressibility of a substance.

* Match the Following. [4]

99.

| Column A | Column B |
|---|---|
| Q.1. Particulate matter | (a) Very large |
| Q.2. Matter is composed of | (b) Tiny particles suspended in the air |
| Q.3. The state of matter depends on | (c) Atoms 86 molecules |
| Q.4. Interparticle spacing in gases | (d) Temperature and Pressure |

Ans. :

| Column A | Column B |
|---|---|
| 1. Particulate matter | (b) Tiny particles suspended in the air |
| 2. Matter is composed of | (c) Atoms molecules |
| 3. The state of matter depends on | (d) Temperature and Pressure |
| 4. Interparticle spacing in gases | (a) Very large |

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