CBE 9th : Chemistry NOTES

MATTER IN OUR SURROUNDING

POINTS TO REMEMBER

1. Anything that occupies space and has mass is known as matter.
2. Matter is not continuous but rather consists of large number of particles.
3. Characteristics of Particle
   - Large number of particles constitutes matter.
   - Particles of matter are very small in size.
   - Particles of matter have spaces between them
   - Particles of matter are continuously moving
4. Solids have definite shape, distinct boundaries and fixed volume
5. Liquids have fixed volume but no fixed shape.
6. Gases neither have fixed shape nor volume.
7. Solids possess least compressibility.

8. Liquids possess higher compressibility than solids.
9. Gases possess highest compressibility as compared to solids and liquids.
10. The process in which a solid changes to liquid state by absorbing heat at constant temperature is called fusion.
11. The temperature at which a solid melts to become a liquid at the atmospheric pressure is called as melting point.
12. SI unit of temperature is Kelvin. T (K) = T (°C) +273
13. The hidden heat which breaks the force of attraction between the molecules during change of state is called latent heat.
14. Latent heat of fusion is the amount of heat energy required to change 1kg of solid into liquid at its melting point.
15. The melting point of a solid is an indication of the strength of the force of attraction between its particles.
16. The temperature at which a liquid changes to solid by giving out heat at atmospheric pressure is called freezing point.
17. The temperature at which a liquid starts boiling at the atmospheric pressure is known as boiling point.
18. Latent heat of vaporisation is the heat energy required to change 1kg of liquid to gas at atmospheric pressure at its boiling point.
19. Boiling is a bulk phenomenon.
20. The phenomenon of change of a liquid into its gaseous state at any temperature below its boiling point is known as evaporation.
21. In evaporation, the conversion of liquid to gaseous state occurs at a much slower rate, compared to boiling.
22. Evaporation takes place only at the surface of the liquid while boiling can take place in all parts of the liquid.
23. Evaporation is surface phenomenon.
24. Boiling is a bulk phenomena.
25. The amount of water vapour present in the air is called humidity.
26. Evaporation is a continuous or ongoing process.
27. Evaporation causes cooling.
28. The process of evaporation of water from the aerial parts of plants especially leaves is known as transpiration.
29. The rate of evaporation is affected by the surface area exposed to atmosphere, temperature, humidity and wind speed.
30. Since evaporation is a surface phenomenon, therefore, it increases with an increase in surface area.
31. Evaporation increases with an increase in temperature.
32. Evaporation decreases with an increase in humidity.
33. Evaporation increases with the increase in wind speed.
34. The process in which a gas changes into liquid state by giving out heat at constant temperature is called condensation.

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CONCEPT APPLICATION LEVEL - I [NCERT Questions]

Q.1 Which of the following are matter?
Chair, air, love, smell, hate, almonds, thought, cold, cold drink, smell of perfume.

Ans. Anything that occupies space and has mass is called matter. Matter can exist in three physical states—solid, liquid, and gaseous.
Chair and almond are forms of matter in the solid state.
Cold drink is a liquid state of matter.
Air and smell of perfume are gaseous states of matter.
Note : The sense of smell is not matter. However, the smell or odour of a substance is classified as matter. The smell of any substance (say, perfume) is the gaseous form of that substance which our olfactory system can detect (even at very low concentrations). Hence, smell of perfume is matter.

Q.2 Give reasons for the following observation :
The smell of hot sizzling food reaches you several metres away, but to get the smell from cold food you have to go close.

Ans. Solids diffuse at a very slow rate. But, if the temperature of the solid is increased, then the rate of diffusion of the solid particles into air increases. This is due to an increase in the kinetic energy of solid particles. Hence, the smell of hot sizzling food reaches us even at a distance, but to get the smell from cold food we have to go close.

Q.3 A diver is able to cut through water in a swimming pool. Which property of matter does this observation show?

Ans. The ability of a diver to cut through water in a swimming pool shows that matter is made up of particles.

Q.4 What are the characteristics of particles of matter?

Ans. The characteristics of particles of matter are :
(i) Particles of matter have spaces between them.
(ii) Particles of matter are continuously moving.
(iii) Particles of mater attract each other.

Q.5 The mass per unit volume of a substance is called density (density = mass/volume). Arrange the following in order of increasing density - air, exhaust from chimney, honey, water, chalk, cotton, and iron.

Ans. The given substances in the increasing order of their densities can be represented as :
Air < Exhaust from chimney < Cotton < Water < Honey < Chalk < Iron

Q.6 (a) Tabulate the differences in the characteristics of states of matter.

(b) Comment upon the following: rigidity, compressibility, fluidity, filling a gas container, shape, kinetic energy, and density.

Ans. (a) The differences in the characteristics of states of matter are given in the following table.

S. No.	Solid state	Liquid state	Gaseous state
1	Definite shape and volume.	No definite shape. Liquids attain the shape of the vessel in which they are kept.	Gases have neither a definite shape nor a definite volume.
2	Incompressible	Compressible to a small extent.	Highly compressible
3	There is little space between the particles of a solid.	These particles have a greater space between them.	The space between gas particles is the greatest.
4	These particles attract each other very strongly.	The force of attraction between liquid particles is less than solid particles.	The force of attraction is least between gaseous particles.
5	Particles of solid cannot move freely.	These particles move freely.	Gaseous particles are in a continuous, random motion.

(b)
- Rigidity can be expressed as the tendency of matter to resist a change in shape.
- Compressibility is the ability to be reduced to a lower volume when force is applied.
- Fluidity is the ability to flow.
- By filling a gas container we mean the attainment of shape of the container by gas.
- Shape defines a definite boundary.
- Kinetic energy is the energy possessed by a particle due to its motion.
- Density is mass per unit volume.

Q.7 Give reasons :

(a) A gas fills completely the vessel in which it is kept.

(b) A gas exerts pressure on the walls of the container.

(c) A wooden table should be called a solid.

(d) We can easily move our hand in air, but to do the same through a solid block of wood, we need a karate expert.

Ans. (a) There is little attraction between particles of gas. Thus, gas particles movefreely in all directions. Therefore, gas completely fills the vessel in which it is kept.

(b) Particles of gas move randomly in all directions at high speed. As a result, the particles hit each other and also hit the walls of the container with a force.
Therefore, gas exerts pressure on the walls of the container.

(c) A wooden table has a definite shape and volume. It is very rigid and cannot be compressed i.e., it has the characteristics of a solid. Hence, a wooden table should be called a solid.

(d) Particles of air have large spaces between them. On the other hand, wood has little space between its particles. Also, it is rigid. For this reason, we can easily move our hands in air, but to do the same through a solid block of wood, we need a karate expert.

Q.8 Liquids generally have lower density as compared to solids. But you must have observed that ice floats on water. Find out why.

Ans. The mass per unit volume of a substance is called density (density = mass/volume).
As the volume of a substance increases, its density decreases.
Though ice is a solid, it has large number of empty spaces between its particles.
These spaces are larger as compared to the spaces present between the particles of water. Thus, the volume of ice is greater than that of water. Hence, the density of ice is less than that of water. A substance with lower density than water can float on water. Therefore, ice floats on water.

Q.9 Convert the following temperature to Celsius scale :
(a) 300 K **(b) 573 K**

Ans. (a) 300 K = (300 – 273)°C = 27°C (b) 573 K = (573 – 273)°C = 300°C

Q.10 What is the physical state of water at :
(a) 250°C **(b) 100°C**

Ans. (a) Water at 250°C exists in gaseous state.
(b) At 100°C, water can exist in both liquid and gaseous form. At this temperature, after getting the heat equal to the latent heat of vaporization, water starts changing from liquid state to gaseous state.

Q.11 For any substance, why does the temperature remain constant during the change of state?

Ans. During a change of state of a substance at its melting point or boiling point, the temperature remains constant because all the heat supplied to a susbtance is utilised in changing the state by overcoming the forces of attraction without increasing kinetic energy between the particles. Therefore, this heat does not contribute in increasing the temperature of the substance.

Q.12 Suggest a method to liquefy atmospheric gases.

Ans. By applying pressure and reducing the temperature, atmospheric gases can be liquefied.

Q.13 Why does a desert cooler cool better on a hot dry day?

Ans. When a liquid evaporates, the particles of the liquid absorb energy from the surroundings to compensate the loss of energy during evaporation. This makes the surroundings cool.
In a desert cooler, the water inside it is made to evaporate. This leads to absorption of energy from the surroundings, thereby cooling the surroundings. Again, we know that evaporation depends on the amount of water vapour present in air (humidity). If the amount of water vapour present in air is less, then evaporation is more. On a hot dry day, the amount of water vapour present in air is less. Thus, water present inside the desert cooler evaporates more, thereby cooling the surroundings more.
That is why a desert cooler cools better on a hot dry day.

Q.14 How does water kept in an earthen pot (matka) become cool during summers?

Ans. There are some pores in an earthen pot through which the liquid inside the pot evaporates. This evaporation makes the water inside the pot cool. In this way, water kept in an earthen pot becomes cool during summers.

Q.15 Why does our palm feel cold when we put some acetone or petrol or perfume on it?

Ans. When we put some acetone or petrol or perfume on our palm, it evaporates. During evaporation, particles of the liquid absorb energy from the surrounding or the surface of the palm to compensate for the loss of energy, making the surroundings cool. Hence, our palm feels cold when we put some acetone or petrol or perfume on it.

Q.16 Why are we able to sip hot tea or milk faster from a saucer than a cup?

Ans. A liquid has a larger surface area in a saucer than in a cup. Thus, it evaporates faster and cools faster in a saucer than in a cup. For this reason, we are able to sip hot tea or milk faster from a saucer than a cup.

Q.17 What type of clothes should we wear in summers?

Ans. We should wear cotton clothes in summers. During summers, we sweat more. On the other hand, cotton is a good absorber of water. Thus, it absorbs sweat from our body and exposes the liquid to the atmosphere, making evaporation faster. During this evaporation, particles on the surface of the liquid gain energy from our body surface, making the body cool.

Q.18 Convert the following temperatures to Celsius scale.

(a) 300 K **(b) 573 K**

Ans. Kelvin is an SI unit of temperature, where 0°C = 273.16 K (approximately 273 K)

(a) 300 K = (300 – 273) °C = 27 °C (b) 573 K = (573 – 273) °C = 300 °C

Q.19 Convert the following temperatures to Kelvin scale.

(a) 25°C **(b) 373°C**

Ans. Kelvin is an SI unit of temperature, where 0°C = 273.16 K (approximately 273 K)

(a) 25 °C = (25 + 273) K = 298 K (b) 373 °C = (373 + 273) K = 646 K

Q.20 Give reason for the following observations.

(a) Naphthalene balls disappear with time without leaving any solid.

(b) We can get the smell of perfume sitting several metres away.

Ans. (a) Naphthalene undergoes sublimation easily i.e., the change of state of naphthalene from solid to gas takes place easily. Thus, naphthalene balls disappear with time without leaving any solid.

(b) Gaseous particles possess high speed and large spaces between them. Particles of perfume diffuse into these gaseous particles at a very fast rate and reach our nostrils. This enables us to smell the perfume from a distance.

Q.21 Arrange the following substances in increasing order of forces of attraction between particles :– water, sugar, oxygen.

Ans. Sugar is a solid; the forces of attraction between the particles of sugar are strong. Water is a liquid; the forces of attraction here are weaker than sugar. Oxygen is a gas; the forces of attraction are the weakest in gases.

Thus, the increasing order of forces of attraction between the particles of water, sugar and oxygen is Oxygen < Water < Sugar

Q.22 What is the physical state of water at –

(a) 25°C **(b) 0°C** **(c) 100°C**

Ans. (a) Water at 25°C is present in the liquid state.

(b) At 0 °C, water can exist as both solid and liquid. At this temperature, after getting the heat equal to the latent heat of fusion, the solid form of water i.e., ice starts changing into its liquid form i.e., water.

(c) At 100 °C, water can exist as both liquid and gas. At this temperature, after getting the heat equal to the latent heat of vaporization, water starts changing from its liquid state to its gaseous state, i.e., water vapours.

Q.23 Give two reasons to justify –

(a) water at room temperature is a liquid.

(b) an iron almirah is a solid at room temperature.

Ans. (a) At room temperature (25°C), water is a liquid because it has the following characteristic of liquid:

(i) At room temperature, water has no shape but has a fixed volume that is, it occupies the shape of the container in which it is kept.

(ii) At room temperature, water flows.

(b) An iron almirah is a solid at room temperature (25°C) because:

(i) It has a definite shape and volume like a solid at room temperature.

(ii) It is rigid as solid at room temperature.

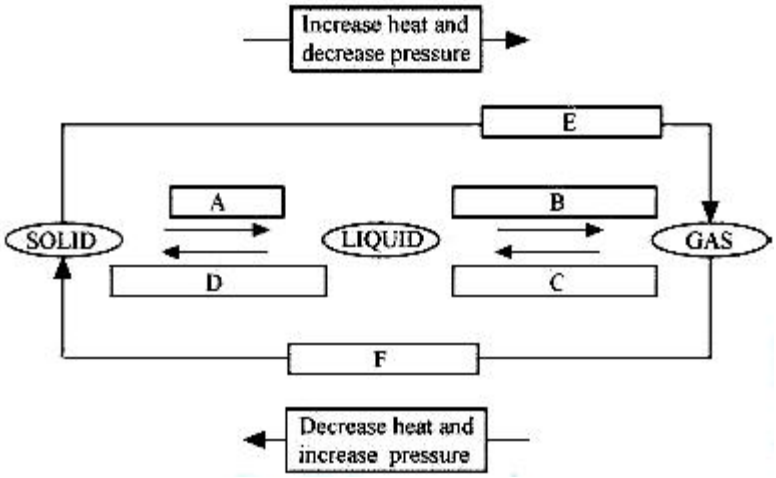
Q.24 Why is ice at 273 K more effective in cooling than water at the same temperature?

Ans. Ice at 273 K has less energy than water (although both are at the same temperature). Water possesses the additional latent heat of fusion. Hence, at 273 K, ice is more effective in cooling than water.

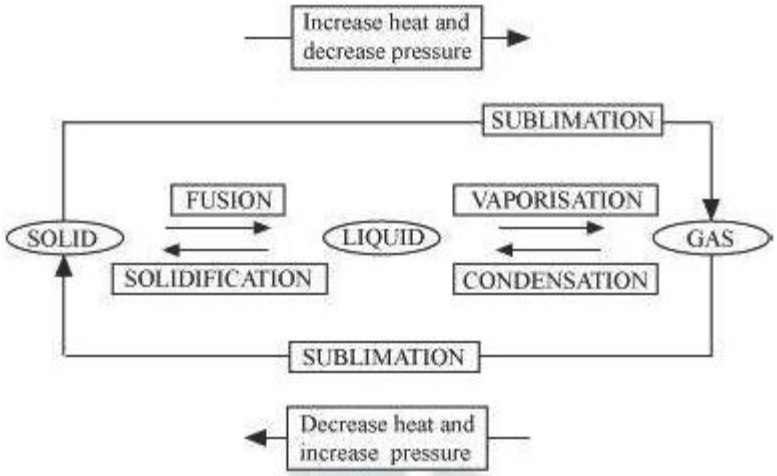
Q.25 What produces more severe burns, boiling water or steam?

Ans. Steam has more energy than boiling water. It possesses the additional latent heat of vaporization. Therefore, burns produced by steam are more severe than those produced by boiling water.

Q.26 Name A, B, C, D, E and F in the following diagram showing change in its state.



Ans.



(A) Fusion (B) Vaporisation (C) Condensation

(D) Solidification (E) Sublimation (F) Sublimation

CONCEPT APPLICATION LEVEL - II

MULTIPLE CHOICE QUESTION WITH ONE CORRECT ANSWERS :

Q.1 When iron nails are placed in copper sulphate solution, after 10 minutes, its blue colour disappears and the solution appears
(A) reddish brown (B) blue (C) light blue (D) greenish

Q.2 Which of the following compounds when dissolved in water give coloured solution ?
(A) Barium chloride (B) Sugar (C) Sodium chloride (D) Copper sulphate.

Q.3 On adding an aqueous solution of barium chloride to that of sodium sulphate, we immediately observe that
(A) A white precipitate is formed (B) A yellow precipitate is formed
(C) A clear and colourless solution is formed (D) No reaction takes place.

Q.4 What is observed when iron nails are added to copper sulphate solution ?
(A) The solution becomes pale green and raddish brown deposit is seen on the nails
(B) The solution becomes colourless
(C) There is no reaction
(D) The solution becomes pale green and no change is observed in sand the iron nails.

Q.5 The process of evaporation is employed to separate a substance from its mixture if :
(A) substance is soluble in water
(B) substance is soluble in water but does not decompose on heating
(C) substance is soluble in water but can decompose on heating
(D) substance is soluble in water but sublimes on heating

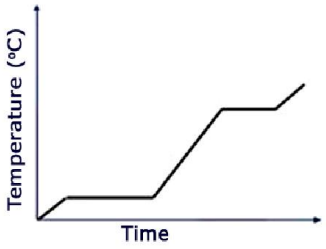
Q.6 Which of the following apparatus is required to determine the boiling point of water ?
(A) Tripod stand, conical flask, thermometer, wire gauze, stand with clamp, pair of tongs
(B) Funnel, burner, clamp and stand, test tube, thermometer, wire gauze, stand with clamp.
(C) Boiling tube beaker, thermometer, burner, cork with one hole, stan with clamp, wire gauze.
(D) Round bottom flask, burner, thermometer, wire gauze, stand with clamp, cork with two holes, glass tube.

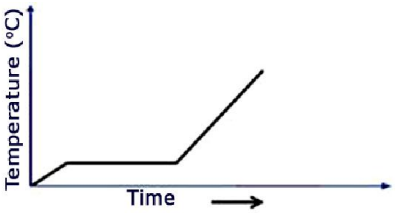
Q.7 In order to find the boiling point of water, one of the precautions is that the bulb of the thermometer should not touch the side of the beaker. This precaution is taken beause :
(A) Sides of the beaker are at slightly higher temperature
(B) Sides of the beaker are at slightly lower temperature
(C) The bulb of the thermometer is likely to break
(D) None of these

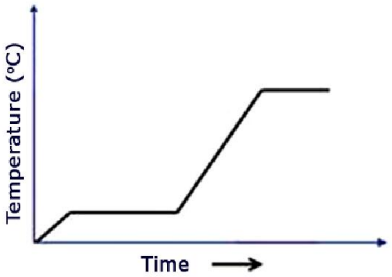
Q.8 When ice melts, cooling is observed because of one of the following :
(A) Density of ice is less than that of water (B) Ice floats over water
(C) Ice absorbs heat from the surroundings (D) Melting point of ice is 0°C

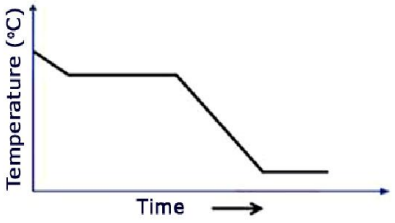
Q.9 In the determination of the melting point of ice, the ice is contaminated with some non-volatile impurities like common salt. The melting point of ice will.
(A) increase (B) decrease
(C) not change (D) may increase or decrease

Q.10 Ice at -10°C is heated slowly until water formed start boiling. What kind of temperature-time graph will explain the correctly?

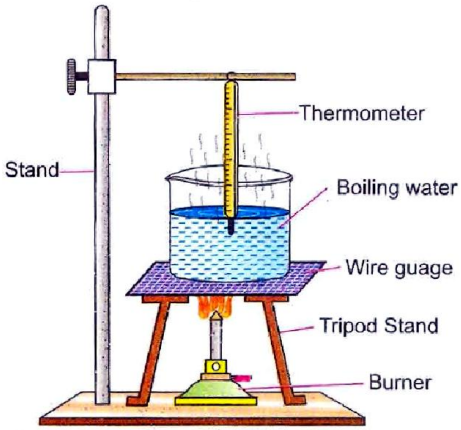
(A) 

(B) 

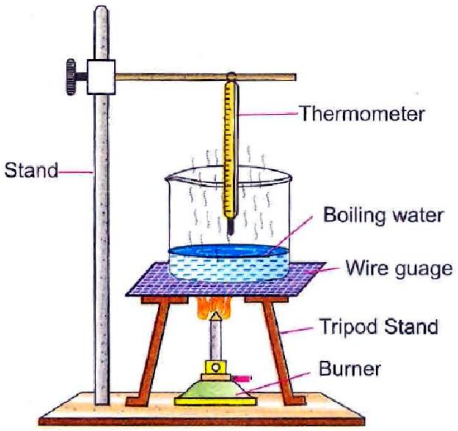
(C) 

(D) 

Q.11 Two students Arpit and Rakshita are asked to arrange the apparatus to determine the boiling point of water. They arranged the apparatus as shown below by figures A and B respectively :



(A)



(B)

The diagram in which the apparatus is correctly arranged is :

(A) A only (B) B only (C) both A nad B (D) neither A nor B

Q.12 While determining the boiling point of water, the thermometer should be kept in such a way that its bulb

(A) remains dipped in water (B) remains just above the surface of water

(C) in touch with the bottom of container (D) remains near the cork of the container

Q.13 While determining the melting point of ice karan used a glass stirrer. The purpose of using glass stirrer is to :

(A) help the fusion process (B) keep the temperature uniform

(C) increase the kinetic energy (D) decrease the kinetic energy

Q.14 A beaker contains 50 g of ice and water mixture. The temperature of this mixture is
(A) less than 0ºC (B) 0ºC (C) more than 0ºC (D) 4°C

Q.15 A thermometer has 20 equal divisions between 90ºC and 100ºC marks. A student while determining the boiling point of water finds that the mercury thread becomes stationary at the 19th mark above 90ºC. He should record the boiling point of water as :
(A) 90.19°C (B) 99.5°C (C) 109°C (D) 119°C

SUBJECTIVE

Q.16 Name the property of gases that helps aquatic plants and animals to survive in water. **[SAI-2013,14]**
Sol Diffustion. Oxygen diffuses in water, which aquatic plants and animals take in.

Q.17 What is the common between three states of matter? **[SAI-2013, 14]**
Sol. The three states of matter can be interconverted.

Q.18 What is atmospheric pressure? What is determined by atmospheric pressure? **[SAI-2014, l5]**
Sol. The pressure exerted by the air is known as atmospheric pressure. At sea level it is taken a 1 atmosphere. It determines both melting and boiling points of any matter because with increase in atmospheric pressure, both melting and boiling points increase.

Q.19 Why evaporation is called a surface phenomenon ? **[SAI-2013,14]**
Sol. Because it is only the particles from the surface which gain enough energy to overcome the forces of attraction present in the liquid and change into the vapour state.

Q.20 (a) Explain why temperature remains constant during interconversion of states of matter.
(b) "Sublimation does not require heating." Is this statement true ? Justify your answer. **[SAI-2015]**
Sol. (a) • Heat supplied to a substance is getting used during changing its state to overcome the force of attraction between the particles.
• The excess heat is absorbed by the particles in the form of latent heat.
(b) Yes, this statement is true. For example, comphor disappears if kept in open air for a few days.

Q.21 It is hot summer day, Priyanshi and Ali are wearing cotton and nylon clothes respectively. Who do you think would be more comfortable and why ? **[SAI–2014]**
Sol. Cotton being a better absorber of water than nylon helps in absorption of water than nylon helps in absorption of sweat followed by evaportion which leads to cooling. So Priyanshi is more comfortable, whereas Ali is not so comfortable.

Q.22 (a) Why does the smell of hot cooked food reach you several metres away within seconds ?

(b) What is the effect of the following on the rate of diffusion :

(i) Temperature (ii) Density of liquid ? **[SAI–2014]**

Sol. (a) The process of diffusion is faster at higher tmperature. Therefore, vapours from hot sizzling food move faster and reach us several metres away within few seconds. But, to get the smell of cold food, we have to go close as it does not emit vapour.

(b) (i) Rate of diffusion increases with increase in temperature. It is due to increase in the kinetic energy of the particles.

(ii) Rate of diffusion is more for a liquid having lower density.

Q.23 (a) When common salt is dissolved in water, what will be the change in volume and why ?

(b) What property of matter is exhibited by this ?

(c) Write any one similarity between three states of matter. **[SAI–2015]**

Sol. (a) Volume will remain same because the particles of salt will get into spaces between the particlesof matter and become invisible. This results in no increase in the volume.

(b) It shows that particles of matter have spaces in-between them.

(c) In all three states of matter, particles occupy space and have mass between them.

Q.24 (a) List out three differnece between evaporation and boiling. **[SAI–2014]**

(b) Why perspiration keeps our body cool ?

Sol. (a)

	Evaporation		**Boiling**
(i)	Evaporation is a surface phenomenon.	(i)	Boiling is a bulk phenomenon.
(ii)	It causes cooling as evaporated molecules	(ii)	It does not cause cooling as heat is constantly absorbed for the process.
(iii)	It Occurs at any temperature below the boiling point of the liquid.	(iii)	It occurs at fixed temperature at the boiling point of the liquid.

(b) During evaporation of sweat latent energy of vaporisation is absorbed from the body and we feel cool.

Q.25 A doctor advises to use ice pad on forehead to bring high fever down insted of using water at 0°C. Why? **[SAI–2014]**

Sol. Because ice pad will absorb more heat as compared to water at 0°C. This energy absorbed will be used to change the state of substance and is known as latent heat of fusion.

Q.26 5 mL of dettol is added to a beaker containing 500 mL of water and stirred. State four observations that you make. **[SAI–2013,14]**

Sol. (i) Level of water remains almost the same.

(ii) A true solution is obtained

(iii) The solution of water becomes white.

(iv) Smell can be detected even on repeated dilution.

CONCEPT APPLICATION LEVEL - III

MULTIPLE CHOICE QUESTIONS

Q.1 The chemical substance used to keep within the clothes to protect from the insects and moths are
(A) sodium chloride. (B) naphthalene. (C) iodine. (D) ammonium chloride.

Q.2 The fifth state of matter is formed by
(A) condensation of water vapours. (B) evaporation of liquids.
(C) sublimation of substance. (D) cooling of gas at super low temperature

Q.3 The temperature at which celsius and fahrenheit scales shows the same reading is
(A) 40° K (B) 100° F (C) –40° C (D) –100° C

Q.4 The super energetic particle is
(A) Solid (B) Plasma (C) Liquid (D) Gas

Q.5 The more effective in cooling is
(A) water at 0°C (B) water at 100ºC (C) ice at 0°C (D) gas at 0ºC

Q.6 The sponge has a
(A) lesser mass than the gold. (B) lesser volume than the gold.
(C) larger mass than the gold. (D) larger volume than the gold.

Q.7 Plasticine is a
(A) solid (B) highly viscous solid
(C) highly viscous liquid (D) gas

Q.8 The liquid is
(A) Honey. (B) Cotton wool. (C) Flour. (D) Plasticine.

Q.9 The type of clothes that are comfortable for us in summer is
(A) Silk clothes (B) Cotton clothes (C) Leather clothes (D) Rayon clothes

Q.10 The following which has definite shape and volume is
(A) Water. (B) Ice. (C) Oxygen. (D) Steam.

Q.11 The following which uses compressed air is
(A) tyres of a bullock cart. (B) juice cans.
(C) air guns. (D) balloons.

Q.12 250 mL milk + 770 cubic meter milk =
(A) 1020 mL (B) 1020 cubic meters
(C) 250.00077 mL (D) 770.00025 cubic meters

Q.13 The following which diffuses faster is
(A) a drop of ink in water. (B) Oxygen in nitrogen.
(C) milk in water. (D) sugar in salt.

Q.14 Anne filled 1L of air in a jar of capacity 750 ml. Volume of air in the jar is
(A) 1000 mL. (B) 875 mL. (C) 750 mL. (D) 250 mL.

Q.15 The following that determines the state of the matter is
(A) pressure and temperature. (B) pressure and volume.
(C) volume and temperature. (D) temperature.

Q.16 Energy of particles in steam at 373 K
(A) > Energy of particles in water at 373K. (B) < Energy of particles in water at 373 K.
(C) = Energy of particles in water at 373 K. (D) Energies cannot be compared.

Q.17 The following that sublimes on heating is
(A) Ice. (B) Dry ice. (C) Water. (D) Water vapours.

Q.18 Melting points of four solids A, B, C & D are 773°C, 826°C, 932°C and 1238°C respectively. The one which has strongest force of attraction between its particles is
(A) A. (B) B. (C) C. (D) D.

Q.19 The normal atmospheric pressure is
(A) 1 atmosphere. (B) 1.01×10 Pa. (C) 1 bar. (D) 1 torr.

Q.20 Rate of evaporation is highest in
(A) an open vessel of diameter 25 cm. (B) an open vessel of diameter 30 cm.
(C) an open vessel of diameter 27.5 cm. (D) an open vessel of radius 26 cm.

Q.21 The liquid which has the highest rate of evaporation is :
(A) Petrol (B) Nail-polish remover (C) Water (D) Alcohol

Q.22 A gas which obeys the gas laws is known as :
(A) An ideal gas (B) A heavier gas (C) A lighter gas (D) A real gas

Q.23 Diffusion is a property of matter, based on
(A) Motion of its particles (B) Size of its particles
(C) Pressure (D) Temperature

Q.24 The process of changing liquid into solid is called
(A) Evaporation (B) Freezing (C) Condensation (D) Sublimation

Q.25 The tendency of non-reacting gases to mix with each other is called as
(A) Chemical reaction (B) Diffusion (C) Effusion (D) Explosion

Q.26 By which property are gases and liquids different from solid ? **[Raj. NTSE Stage-I/14]**
(A) Volume (B) Mass (C) Conductivity (D) Fluidity

Q.27 Ice is floating on water in a beaker when ice completely melts then level of water in beaker :
(A) Increases (B) Decreases **[Delhi NTSE Stage-I/15]**
(C) remains the same (D) First increases decreases

Q.28 The boiling point of a gas is –80°C. This temperature is equivalent to **[Raj. NTSE Stage-I/15]**
(A) –193 K (B) 193 K (C) 353 K (D) – 353 K

Q.29 When the solid melts, its temperature : **[Haryana_NTSE Stage-I/15]**
(A) increases (B) decreases
(C) remain constant (D) first increases then decrease

Q.30 A drop each of two non-corrosive and non-irritating liquids A and B at a temperature of 22ºC are placed on the skin. Liquid A gives a more cooling sensation than liquid B.Which of the following can be said about the liquids A and B? **[NTSE Stage-II ,2013]**
(A) Liquid A has higher boiling point than that of liquid B.
(B) Liquid A has higher latent heat of vaporisation than that of liquid B.
(C) Liquid A has lower latent heat of vaporisation than that of liquid B.
(D) The boiling points of liquid A and B are equal.

Q.31 Identify the false statement among the following :
(A) Compound is homogeneous in nature.
(B) In compound constituents do not retain their properties.
(C) The constituents of a mixture can be separated by physical method.
(D) During formation of mixtures there is a change in the molecular composition.

Q.32 **Assertion (A) :** Dogs stretch out their tongues in summer.
Reason (R) : Evaporation leads to cooling.
(A) Both A and R are true and R is the correct explanation for A.
(B) Both A and R are true but R is not the correct explanation for A.
(C) A is true and R is false.
(D) A is false and R is true.

Q.33 **Assertion (A) :** Rate of evaporation is less in rainy season.
Reason (R) : Rate of evaporation is directly proportional to humidity.
(A) Both A and R are true and R is the correct explanation for A.
(B) Both A and R are true but R is not the correct explanation for A.
(C) A is true and R is false.
(D) A is false and R is true.

Q.34 **Assertion (A) :** Baking soda($NaHCO_3$) is a compound.
Reason (R) : Properties of $NaHCO_3$ are absolutely different from sodium, carbon, hydrogen and oxgen.
(A) Both A and R are true and R is the correct explanation for A.
(B) Both A and R are true but R is not the correct explanation for A.
(C) A is true and R is false.
(D) A is false and R is true.

Q.35 **Assertion (A) :** Carbonated drinks produce a hiss sound when opened.
Reason (R) : Carbonated drinks are prepared by the diffusion of gas in water and when opened, the gases come out of the pressurized bottles causing a hissing sound.
(A) Both A and R are true and R is the correct explanation for A.
(B) Both A and R are true but R is not the correct explanation for A.
(C) A is true and R is false.
(D) A is false and R is true.

Q.36 **Assertion (A) :** The temperature remains constant during change of state.
Reason (R) : Heat is used to overcome the forces of attraction.
(A) Both A and R are true and R is the correct explanation for A.
(B) Both A and R are true but R is not the correct explanation for A.
(C) A is true and R is false.
(D) A is false and R is true.

Q.37

Column I (principle)	**Column II (Procedure)**
(1) Evaporation	(a) Purification of drinking water which contains suspended matter
(2) filtration	(b) Earthen pots
(3) Sublimation	(c) Odonil used in washroom

(A) 1 → a, 2 → c, 3 → b
(B) 1 → c, 2 → a, 3 → b
(C) 1 → c, 2 → b, 3 → a
(D) 1 → b, 2 → a, 3 → c

Q.38

Column I	**Column II**
(1) Dry ice	(a) Domestic gas
(2) LPG	(b) Solid carbon dioxide
(3) Marsh gas	(c) Methane
(4) Super cooled liquid	(d) Water

(A) 1 → c, 2 → b, 3 → d, 4 → a
(B) 1 → d, 2 → c, 3 → b, 4 → a
(C) 1 → b, 2 → a, 3 → c, 4 → d
(D) 1 → b, 2 → c, 3 → d, 4 → a

Q.39

Column I	**Column II**
(1) Smell of hot food reaches far away	(a) There are vacant spaces between water molecules in ice.
(2) Ice floats on water	(b) matter uses latent heat to change the state.
(3) Temperature remains constant during the change of state	(c) High temperature and low humidity causes increased evaporation.
(4) Desert cool better on a hot dry day	(d) Hot particles diffuse faster in air

(A) 1 → d, 2 → a, 3 → b, 4 → c
(B) 1 → d, 2 → c, 3 → b, 4 → a
(C) 1 → b, 2 → a, 3 → c, 4 → d
(D) 1 → b, 2 → c, 3 → d, 4 → a

Q.40

Column I	**Column II**
(1) Diffusion	(a) Sublime
(2) Naphthalene	(b) The free mixing of molecules.
(3) Evaporation	(c) Independent
(4) Intensive	(d) Liquid into vapours

(A) 1 → c, 2 → b, 3 → d, 4 → a
(B) 1 → b, 2 → a, 3 → d, 4 → c
(C) 1 → b, 2 → a, 3 → c, 4 → d
(D) 1 → b, 2 → c, 3 → d, 4 → a

ANSWER KEY

CONCEPT APPLICATION LEVEL - II

Q.1	D	Q.2	D	Q.3	A	Q.4	A	Q.5	B	Q.6	D	Q.7	B
Q.8	C	Q.9	B	Q.10	C	Q.11	B	Q.12	A	Q.13	B	Q.14	C
Q.15	B												

CONCEPT APPLICATION LEVEL - III

Q.1	B	Q.2	D	Q.3	C	Q.4	B	Q.5	C	Q.6	D	Q.7	A
Q.8	A	Q.9	B	Q.10	B	Q.11	C	Q.12	D	Q.13	C	Q.14	C
Q.15	A	Q.16	A	Q.17	B	Q.18	D	Q.19	A	Q.20	B	Q.21	A
Q.22	A	Q.23	A	Q.24	B	Q.25	B	Q.26	D	Q.27	C	Q.28	B
Q.29	C	Q.30	C	Q.31	D	Q.32	A	Q.33	C	Q.34	A	Q.35	A
Q.36	A	Q.37	D	Q.38	C	Q.39	A	Q.40	B				