1. What is the correct term for the phase change from gas directly into solid?
   (*a*) Evaporation (*b*) Sublimation (*c*) Fusion (*d*) Condensation
2. When a crystal of copper sulphate is added to water in a beaker, water becomes blue. This is an example of
   (*a*) diffusion (*b*) evaporation (*c*) sublimation (*d*) effusion
3. When heat is supplied by a burner to boiling water, then the temperature of water during vaporisation
   (*a*) rises slowly (*b*) rises rapidly
   (*c*) first rises and then becomes constant (*d*) does not rise at all
4. A gas can be liquefied by
   (*a*) lawering the temperature (*b*) increasing the temperature
   (*c*) increasing the pressure
   (*d*) both by increasing the pressure and lawering the temperature
5. A liquid boils at 100°C. Its temperature can also be expressed as
   (*a*) 87.5° F (*b*) 373 K (*c*) 173 K (*d*) 132° F
6. The three states of water ; ice, water and steam can be arranged in the decreasing order of interparticle forces a
   (*a*) ice < steam < water (*b*) water < steam < ice
   (*c*) ice < water < steam (*d*) steam < water < ice
7. When water solidifies to ice, then heat is
   (*a*) absorbed (*b*) evolved
   (*c*) may be evolved or absorbed (*d*) no change in heat
8. Evaporation decreases by
   (*a*) increase in temperature (*b*) increase in humidity
   (*c*) increase in wind speed (*d*) increase in surface area
9. Which of the following state has maximum energy?
   (*a*) ice (*b*) water
   (*c*) steam (*d*) all have same energy
10. Which of the following is not matter?
    (*a*) Cold drink (*b*) Cold (*c*) Hot coffee (*d*) Air

B. Say True or False

11. Gases have more intermolecular spaces than liquids.
12. 92 K is equivalent to – 181°C.
13. On condensation heat is absorbed.
14. If the boiling point of a substance is below the room temperature at the atmospheric pressure, then it is called a liquid.
15. Rate of evaporation increases with decrease in humidity.

C. Fill the Blanks

16. The process of conversion of a gas into a liquid by increasing pressure and decreasing temperature is called.....
17. Condensation process is opposite to ..... process.
18. With increase in wind speed evaporation.....
19. A liquid diffuses ..... than a gas.
20. The process of change of a solid directly into gaseous state is called .....

NTSE—Target: Scholastic Aptitude Test-SAT

1. Which of the following is not a matter ?
   (a) Chair (b) Air
   (c) Smell (d) Cold drink.
2. 300 K temperature may be written in Celsius scale as
   (a) 300°C (b) 127°C
   (c) 27°C (d) 573°C.
3. The physical state of water at 10°C is
   (a) Solid (b) liquid
   (c) gas (d) may be solid or liquid.
4. The substance which can readily sublime is
   (a) Ammonium chloride
   (b) Sodium chloride
   (c) Hydrochloric acid
   (d) Chlorine gas.
5. The large volumes of gases can be put into small volumes of cylinders because of their property known as
   (a) Sublimation (b) Compressibility
   (c) Evaporation (d) Solidification.
6. The temperature at which a liquid changes into gas is known as
   (a) melting point (b) transition point
   (c) boiling point (d) Kelvin point.
7. The boiling point of water at normal atmospheric pressure is
   (a) 273 K (b) 373 K
   (c) 100 K (d) 0°C
8. Which of the following factor does not increase the rate of evaporation ?
   (a) increase of temperature
   (b) increase in wind speed
   (c) increase in surface area
   (d) increase in humidity

Which of the following is not correct regarding gases?
(a) Gases exert pressure
(b) Gases are more compressible than liquids
(c) Gases have very weak tendency to diffuse
(d) Gases have weak intermolecular forces of attraction.

10. Which of the following has highest intermolecul forces of attraction?
    (a) liquid water (b) liquid ethyl alcohol
    (c) gaseous CO_2 (d) solid CO_2. (2012-13
11. In the sublimation process
    (a) a solid changes directly to vapour state
    (b) liquid changes to vapour state
    (c) solid initially melts and then changes to vapour state
    (d) vapour changes to the liquid state.
12. When water solidifies to ice, then heat is
    (a) absorbed (b) evolved
    (c) heat may be evolved or absorbed
    (d) no change in heat
13. The three states of matter can be arranged in the decreasing order of interparticle forces as
    (a) solid > gas > liquid
    (b) liquid > gas > solid
    (c) solid > liquid > gas
    (d) gas > liquid > solid (2013-14)
14. The standard room temperature is taken as
    (a) 273 K (b) 0°C
    (c) 298 K (d) 373 K
15. Which of the following statements is not correct ?
    (a) Steam produces more severe burns on the skin than the boiling water.
    (b) Water at room temperature is a liquid.
    (c) Ice at 273 K causes less cooling than water at the same temperature.
    (d) We can sip hot tea from a saucer faster than from a cup.
16. The freezing point of water is
    (a) 273 K (b) 298 K
    (c) 373 K (d) 300 K
17. 1 atm is equal to
    (a) 1 Pascal (b) 1.01×10^5 Pascal
    (c) 1 mm Hg (d) 100 mm Hg

1. Label the changes (a) to (d) below :

Ice (*s*) $\underset{(c)}{\overset{(a)}{\rightleftharpoons}}$ Water (*l*) $\underset{(d)}{\overset{(b)}{\rightleftharpoons}}$ Steam (*g*)

2. Complete the following conversions :

(*a*) .....°C = 372 K

(*b*) 82°C = ... K

(*c*) 373°C = ... K

(*d*) .....°C = 569K

(*e*) 1 atm = ... Pascal

(*f*) ..... atm = 2.02×10^5 Pascal

(*g*) 2000 mL = ... L

(*h*) 1 L = ... dm^3

3. Name the following phenomena :

(*a*) Conversion of liquid to gas .....

(*b*) Conversion of gas to solid directly .....

(*c*) Conversion of gas to liquid .....

4. Predict whether the process of evaporation increases/decreases with the following factors :

(*a*) decrease in humidity .....

(*b*) decrease in wind speed .....

(*c*) increase of temperature .....

(*d*) increase of surface area .....

(*e*) decrease of temperature .....

5. Complete the following paragraph :

There are three states of matter namely ....., ... and ..... . The particles of solids are ..... closely packed than liquids while those of gases are ..... packed than liquids. The particles in a ..... can move around freely because there are weak ..... between them. When particles come closer together, for example when a gas ..... energy is given out. But we need to supply ..... to increase distance between particles.

6. In which state of matter particle motion is maximum?
7. Melting point of a substance is below room temperature. Predict its state at room temperature.
8. Define latent heat of fusion.
9. Name the process which is opposite to vaporisation.
10. Out of Celsius and Kelvin scale of temperature, which is considered better and why?
11. At what temperature does solid ice and liquid water co-exist?
12. What is value of temperature in Kelvin scale corresponding to –10°C?
13. Write full form of LPG and CNG.
14. Arrange the three states of matter in the increasing order of particle motion.
15. What is dry ice?
16. Do we sweat more on a dry day or on a humid day?
17. What type of clothes should we wear in summer?
18. The melting point of wax is 339K. What is its value in Celsius scale?
19. Name two factors which increase the rate of evaporation.
20. Define sublimation. Name one substance which sublimes.
21. Which type of motion is associated with solids?
22. How is Celsius degree related to Kelvin degree?
23. How is Fahrenheit degree related to Celsius degree?
24. What phenomenon occurs during drying of wet clothes?
25. Arrange the following substances in the increasing order of forces of attraction between their particles :

    Water, ice, steam

B. Quiz Questions:

1. A rubber band changes its shape when stretched. Can it be regarded as solid? Say yes or no.
2. Carbon dioxide gas is heavier than both nitrogen and oxygen but it does not form lower layer in the atmosphere. This is because of a phenomenon known as ..... .
3. The physical states of water at 0°C and 27°C are ..... and ..... respectively. Complete it.
4. If boiling point of water is 100°C, its value in Kelvin scale is ..... .
5. The evaporation increases with increase in temperature and decrease in humidity. Is it true or false?
6. Does the temperature of a liquid become constant once it starts boiling? Say yes or no.
7. Does water boil at 100°C under all pressures?
8. Which of the two diffuses faster : a liquid or a gas?
9. Select the substances which can sublime :

    ammonium chloride, calcium nitrate, naphthalene, wax
10. Solid carbon dioxide is called ..... .
11. Out of solid, liquid or gaseous state, which state has low molecular motion of its molecules?
12. Can we regard smell of perfume as matter? Say yes or no.
13. The melting points of two substances A and B are 265K and 305K respectively. Substance A is liquid and substance B is solid. Is it true or false?
14. Does sodium chloride sublime on heating? Say yes or no.
15. Does the temperature of a solid become constant once it starts melting? Say yes or no.
16. Alcohol evaporates faster than water. Is it true or false?
17. The boiling point of water is lower in Shimla (hill station) than Delhi. True or False.
18. A punctured tyre becomes flat more easily in summers than in winters. True or False.

1. Which one of the following sets of phenomena would increase on raising the temperature?
   (*a*) Diffusion, evaporation, compression of gases
   (*b*) Evaporation, compression of gases, solubility
   (*c*) Evaporation, diffusion, expansion of gases
   (*d*) Evaporation, solubility, diffusion, compression of gases

2. Seema visited a Natural Gas Compressing Unit and found that the gas can be liquefied under specific conditions of temperature and pressure. While sharing her experience with friends she got confused. Help her to identify the correct set of conditions
   (*a*) Low temperature, low pressure
   (*b*) High temperature, low pressure
   (*c*) Low temperature, high pressure
   (*d*) High temperature, high pressure

3. The property to flow is unique to fluids. Which one of the following statements is correct?
   (*a*) Only gases behave like fluids
   (*b*) Gases and solids behave like fluids
   (*c*) Gases and liquids behave like fluids
   (*d*) Only liquids are fluids

4. During summer, water kept in an earthen pot becomes cool because of the phenomenon of
   (*a*) diffusion (*b*) transpiration
   (*c*) osmosis (*d*) evaporation

5. A few substances are arranged in the increasing order of 'forces of attraction' between their particles. Which one of the following represents a correct arrangement?
   (*a*) Water, air, wind (*b*) Air, sugar, oil
   (*c*) Oxygen, water, sugar (*d*) Salt, juice, air

6. On converting 25°C, 38°C and 66°C to Kelvin scale, the correct sequence of temperature will be
   (*a*) 298 K, 311 K and 339 K
   (*b*) 298 K, 300 K and 338 K
   (*c*) 273 K, 278 K and 543 K
   (*d*) 298 K, 310 K and 338 K

7. Choose the correct statement of the following
   (*a*) conversion of solid into vapours without passing through the liquid state is called vaporisation.
   (*b*) conversion of vapours into solid without passing through the liquid state is called sublimation.
   (*c*) conversion of vapours into solid without passing through the liquid state is called freezing.
   (*d*) conversion of solid into liquid is called sublimation.

8. The boiling points of diethyl ether, acetone and n-butyl alcohol are 35°C, 56°C and 118°C respectively. Which one of the following correctly represents their boiling points in Kelvin scale?
   (*a*) 306 K, 329 K, 391 K (*b*) 308 K, 329 K, 392 K
   (*c*) 308 K, 329 K, 391 K (*d*) 329 K, 392 K, 308 K

9. Which condition out of the following will increase the evaporation of water?
   (*a*) Increase in temperature of water
   (*b*) Decrease in temperature of water
   (*c*) Less exposed surface area of water
   (*d*) Adding common salt to water

10. In which of the following conditions, the distance between the molecules of hydrogen gas would increase?
   (*i*) Increasing pressure on hydrogen contained in a closed container
   (*ii*) Some hydrogen gas leaking out of the container
   (*iii*) Increasing the volume of the container of hydrogen gas
   (*iv*) Adding more hydrogen gas to the container without increasing the volume of the container
   (*a*) (*i*) and (*iii*) (*b*) (*i*) and (*iv*)
   (*c*) (*ii*) and (*iii*) (*d*) (*ii*) and (*iv*)

18. A solid melts at 52°C. Its temperature on Kelvin scale is
(a) 52 K (b) 325 K
(c) 352 K (d) 425 K **(2014-15)**

19. A substance is said to be in the liquid state if under normal pressure its
(a) melting point is above the room temperature
(b) boiling point is below the room temperature
(c) melting point is below the room temperature
(d) boiling point is above the room temperature.

20. Which of the following statements explains why a gas fills the container in which it is kept?
(i) The particles in a gas are larger than those in a liquid.
(ii) The particles in a gas have very small attractive forces between them.
(iii) The particles in a gas are constantly moving very quickly.
(a) (i) only (b) (ii) only
(c) (i) and (ii) (d) (ii) and (iii)

21. When heat is supplied constantly by a gas burner with a small flame to melt ice, then the temperature of ice during melting.
(a) increases slowly to form water
(b) remains constant
(c) first remains constant and then decreases
(d) decreases very slowly. **(2012-13)**

22. The conversion of a solid into vapours without passing through the liquid state is called
(a) sublimation (b) vaporisation
(c) fusion (d) liquefication **(2013-14)**

23. Latent heat of vaporisation of water is
(a) 18 kJ/kg (b) 22.5×10^2 kJ/kg
(c) 3.34×10^5 J/kg (d) Zero **(2013-14)**

24. Which of the following does not undergo sublimation?
(a) Sodium chloride (b) Ammonium chloride
(c) Camphor (d) Iodine **(2013-14)**

25. Ice melts at 0°C. This temperature is equivalent to
(a) 32°F (b) 0°F
(c) 273°F (d) 66°F

26. The body temperature of a normal healthy person is 98.6°F. What is the temperature on the Celsius scale?
(a) 42°C (b) 28.6°C
(c) 37°C (d) 48.2°C

27. When water solidifies to ice, then heat is
(a) absorbed
(b) evolved
(c) no change
(d) may be evolved or absorbed

28. At the melting point temparature of ice,
(a) only ice is present
(b) only water is present
(c) both ice and water are present
(d) none of these is correct.

29. Dry ice is an example of ..... process.
(a) evaporation (b) crystallisation
(c) sublimation (d) purification **(2014-15)**

30. The boiling point of a gas is – 80°C. This temperature is equivalent to
(a) −193 K (b) 193 K
(c) 353 K (d) −353 K. **(2015-16)**