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| ***Question 1*** | Which of the following statements is incorrect? |
| ***A)*** | The particles of matter are very, very small. |
| ***B)*** | The particles of matter attract one another. |
| ***C)*** | The particles of all the matter have spaces between them. |
| ***D)*** | The particles of some of the matter are moving constantly. |
| ***Correct Answer*** | *(D)* |
| ***Explanation*** | The particles of some of the matter are moving constantly. |
| ***Difficulty Level*** | Easy |

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| ***Question 2*** | Among the following, which one is the false statement? |
| ***A)*** | Sublimation is the process of conversion of a matter from its liquid state to gaseous state at specific  conditions of temperature and pressure. |
| ***B)*** | Naphthalene, camphor, iodine, ammonium chloride undergo sublimation. |
| ***C)*** | The melting point of ice is 0°C or 273.16K |
| ***D)*** | *Condensation is the process of conversion of matter from its gaseous state to liquid state at specific*  *conditions of temperature and pressure.* |
| ***Correct Answer*** | Sublimation is the process of conversion of a matter from its liquid state to gaseous state at specific conditions of temperature and  pressure. |
| ***Explanation*** | Sublimation is the process of transformation directly from the solid phase to the gaseous phase, without passing through an  intermediate liquid phase. Also, at pressures below the triple point pressure, an increase in temperature will result in a solid  being converted to gas without passing through the liquid region. |
| ***Difficulty Level*** | Medium |

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| ***Question 3*** | Humidity is amount of: |
| ***A)*** | Water vapours in air |
| ***B)*** | Ice in air. |
| ***C)*** | Liquid water in air. |
| ***D)*** | Water vapours and liquid water in air. |
| ***Correct Answer*** | Water vapours in air |
| ***Explanation*** | Humidity is the amount of water vapour present in air. Water vapour, the gaseous state of water, is generally invisible to the human  eye. Humidity indicates the likelihood for precipitation, dew, or fog to be present. |
| ***Difficulty Level*** | Hard |

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| ***Question*** | 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. |
| ***Correct Answer*** | Kerosene. |
| ***Explanation*** | Liquids have no fixed shape but have a fixed volume. Among the given options, only kerosene is a liquid. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | On converting 25°C, 38°C and 66°C to Kelvin scale, the correct sequence of temperature will be: |
| ***A)*** | 298K, 311K and 339K |
| ***B)*** | . 298K, 300K and 338K |
| ***C)*** | 273K, 278K and 543K |
| ***D)*** | 298K, 310K and 338K |
| ***Correct Answer*** | 298K, 311K and 339K |
| ***Explanation*** | On converting 25°C, 38°C and 66°C, to kelvin scale, we get the following temperatures ⇒ 25°C + 273 = 298K ⇒ 38°C + 273 = 311K ⇒ 66°C + 273 = 339K Therefore, the correct sequence of temperature will be 298K, 311K and 339K. |
| ***Difficulty Level*** | Medium |

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| ***Question*** | Which of the following statement is correct? |
| ***A)*** | Sponge is compressible, but considered as a solid. |
| ***B)*** | A rubber band, change shape under force and not regains the same shape when force is removed. |
| ***C)*** | Mass multiply be volume is called density of its substance. |
| ***D)*** | The common name of solids and liquids is fluid. |
| ***Correct Answer*** | Sponge is compressible, but considered as a solid. |
| ***Explanation*** | Yes, sponge is a solid. Although sponge has small pores which traps air however it releases the same when the sponge is pressed and by this we are able to compress it. This helps the sponge to regain its shape and mass. |
| ***Difficulty Level*** | hard |

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| ***Question*** | What will be the correct sequence of temperature when 25°C and 45°C are converted to Kelvin scale and Fahrenheit scale? |
| ***A)*** | 278.16K, 308.16K, 74°F, 103°F |
| ***B)*** | 298.16K, 318.16K, 74° F, 103°F |
| ***C)*** | 298.16K, 318.16K, 77° F, 113°F |
| ***D)*** | 318.16K, 298.16K, 77° F, 113°F |
| ***Correct Answer*** | 298.16K, 318.16K, 77°F, 113°F |
| ***Explanation*** |  |
| ***Difficulty Level*** |  |
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| ***Question*** | . Which of the following factors are responsible for the change in state of solid carbon dioxide when kept exposed to air?  1. Increase in pressure  2. Increase in temperature  3. Decrease in pressure  4. Decrease in temperature |
| ***A)*** | (i) and (ii) |
| ***B)*** | (i) and (iii) |
| ***C)*** | (ii) and (iii) |
| ***D)*** | (ii) and (iv) |
| ***Correct Answer*** | (ii) and (iii) |
| ***Explanation*** | Increase in temperature and decrease in pressure are the two factors responsible for the change of solid carbon dioxide into gas. |
| ***Difficulty Level*** | Easy |
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| ***Question*** | 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. |
| ***Correct Answer*** | Increase in temperature of water. |
| ***Explanation*** | Increase in temperature of water will increase the evaporation of water. It is because, on increasing the temperature, kinetic energy of water molecules increases and more particles get enough kinetic energy to go into the vapour state. This increases the rate of evaporation. |
| ***Difficulty Level*** | Medium |
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| ***Question*** | Find out the false sentences |
| ***A)*** | Golgi apparatus is involved with the formation of lysosomes |
| ***B)*** | Nucleus, mitochondria and plastid have DNA; hence they are able to make their own structural proteins. |
| ***C)*** | Mitochondria is said to be the power house of the cell as ATP is generated in them. |
| ***D)*** | Cytoplasm is called as protoplasm. |
| ***Correct Answer*** | Cytoplasm is called as protoplasm. |
| ***Explanation*** | Along with the function of secretion of various enzyme proteins and producing vacoules, Golgi apparatus is also involved in the synthesis of cell wall, plasma membrane and lysosome. Nucleus, mitochondria and plastids have their own genome (i.e., DNA) and ribosomes. They are self replicating organelles i.e., they have power to divide and are able to synthesise their own structural protein (semi autonomous organelles). Mitochondria is site of cellulose respiration and synthesis of energy rich compounds (ATP). Therefore it is called as power house of the cell. The part of cell which between the plasma membrane and nuclear envelope is called the cytoplasm. |
| ***Difficulty Level*** | Hard |
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| ***Question*** | The boiling point of diethylether, acetone and n-butyl alcohol are 35°C, 56°C and 118°C respectively. Which one of the following represents their boiling points in kelvin scale? |
| ***A)*** | 306K, 329K, 391K |
| ***B)*** | 308K, 329K, 392K |
| ***C)*** | 308K, 329K, 391K |
| ***D)*** | 328K, 391K, 307K |
| ***Correct Answer*** | 308K, 329K, 391K |
| ***Explanation*** | The correct order of boiling points of diethyl ether, acetone and n-butyl alcohol in kelvin scale is 308K, 329K and 391K, which can be explained as (T°C + 273 = 7K). Boiling point of diethyl ether = 35°C + 273 = 308K Boiling point of acetone = 56°C + 273 = 329K Boiling point of n-butyl alcohol = 118°C + 273 = 391K |
| ***Difficulty Level*** | Easy |
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| ***Question*** | Kinetic energy of particles of water in three vessels X, Y and Z are Ex, Ey and Ez respectively. Then the temperature of water in the three vessels are: |
| ***A)*** | TZ > TX > TY |
| ***B)*** | TX > TY > TZ |
| ***C)*** | TX > TZ > TY |
| ***D)*** | TY > TZ > TX |
| ***Correct Answer*** | TX > TY > TZ |
| ***Explanation*** | Because increase in temprature increases vibrations of atoms and thus their kinetic energy increases. The higher the temperature,the higher will be the kinetic energy. |
| ***Difficulty Level*** | Medium |
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| ***Question*** | The boiling point of ethane is, -88°C. This temperature will be equivalent to: |
| ***A)*** | 285K |
| ***B)*** | 288K |
| ***C)*** | 185K |
| ***D)*** | 361K |
| ***Correct Answer*** | 185K |
| ***Explanation*** | We have to add 273 to the given value to get the answer i.e. -88 + 273 = 185K |
| ***Difficulty Level*** | Hard |

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| ***Question*** | When a gas jar full of air is placed upside down on a gas jar full of bromine vapours, the red-brown vapours of bromine from the lower jar go upward into the jar containing air. In this experiment: |
| ***A)*** | Air is heavier than bromine. |
| ***B)*** | Both air and bromine have the same density. |
| ***C)*** | Bromine is heavier than air. |
| ***D)*** | Bromine cannot be heavier than air because it is going upwards against gravity. |
| ***Correct Answer*** | Bromine is heavier than air. |
| ***Explanation*** | The process occurring here is diffusion and it is unaffected by the mass. Therefore, bromine being heavier, mixes with the colourless air. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | 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. |
| ***Correct Answer*** | Oxygen, water, suga |
| ***Explanation*** | The correct order of increasing ‘force of attraction’ between their particles is Oxygen < Water < Sugar It is because the force of attraction increases in the order i.e., Gas < Liquid < Solid. |
| ***Difficulty Level*** | Medium |

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| ***Question*** | Crystals of KMnO in water proves that: |
| ***A)*** | KMnO4 is of red colour. |
| ***B)*** | KMnO4 is acidic in nature. |
| ***C)*** | KMnO4 is made up of millions of tiny particles. |
| ***D)*** | KMnO4 is a reducing agent. |
| ***Correct Answer*** | KMnO4 is made up of millions of tiny particles |
| ***Explanation*** | Each potassium permanganate crystal is made up of millions of small particles which keep on spreading and imparting colour to the water in which it is dissolved. The changing of a solid directly into vapours on heating is called sublimation. |
| ***Difficulty Level*** | Hard |

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| ***Question*** | When a gas jar containing colourless air is kept upside down over a gas jar full of brown-coloured bromine vapour, then after sometime, the brown colour of bromine vapour spreads into the upper gas jar making both the gas jars appear brown in colour. Which of the following conclusion obtained from these observations is incorrect? |
| ***A)*** | Bromine vapour is made of tiny particles which are moving. |
| ***B)*** | . Air is made up of tiny particles which are moving. |
| ***C)*** | The particles of bromine are moving but those of air are not moving. |
| ***D)*** | Even though bromine vapour is heavier than air, it can move up against gravity. |
| ***Correct Answer*** | The particles of bromine are moving but those of air are not moving |
| ***Explanation*** | The statement that the particles of bromine are moving but those of air are not moving is incorrect because the particles of matter are constantly in motion. It appears as if the air molecules are not moving because air is colourless. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | On converting 308K, 329K and 391K to Celsius scale, the correct sequence of temperatures will be: |
| ***A)*** | 33°C, 56°C and 118°C |
| ***B)*** | 35°C, 56°C and 119°C |
| ***C)*** | 35°C, 56°C and 118°C |
| ***D)*** | 56°C, 119°C and 35°C |
| ***Correct Answer*** | 35°C, 56°C and 118°C |
| ***Explanation*** | Just subtract 273K from the given values to get the answer |
| ***Difficulty Level*** | Hard |

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| ***Question*** | 300K, 268K, 546K are equal to: |
| ***A)*** | 27°C, 5°C, 273°C |
| ***B)*** | 27°C, -5°C, 273°C |
| ***C)*** | 27°C, -5°C, -273°C |
| ***D)*** | -27°C, -5°C, 273°C |
| ***Correct Answer*** | 27°C, -5°C, 273°C |
| ***Explanation*** | 1. Temperature in °C = Temperature in kelvin - 273 = 300 - 273 = 27°C  2. Temperature in °C = Temperature in kelvin - 273 = 268 - 273 = -5°C  3. Temperature in °C = Temperature in kelvin - 273 = 546 - 273 = 273°C |
| ***Difficulty Level*** | Hard |

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| ***Question*** | During summer, water kept in an earthen pot becomes cool because of the phenomenon of: |
| ***A)*** | Diffusion. |
| ***B)*** | Transpiration. |
| ***C)*** | Osmosis. |
| ***D)*** | Evaporation |
| ***Correct Answer*** | Evaporation. |
| ***Explanation*** | Evaporation of water through the pores of the earthen pot reduces the temperature of the immediate surroundings. Due to this, water in the earthen pot becomes cooler after some time. Transpiration is a phenomenon that happens in plants. Osmosis happens between regions of different concentrations of solvent through a semi-permeable membrane. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | A student heats a beaker containing ice and water. He measures the temperature of the contents of a beaker as a function of time. Which of the following will correctly represent the results? |
| ***A)*** |  |
| ***B)*** |  |
| ***C)*** |  |
| ***D)*** |  |
| ***Correct Answer*** |  |
| ***Explanation*** | Since ice and water are in equilibrium, the temperature would be zero. When we heat the mixture, energy supplied is utilised in melting the ice and the temperature does not change till all the ice melts because of latent heat of fusion. On further heating, the temperature of the water would increase. Therefore, the correct option is (d). |
| ***Difficulty Level*** | Medium |

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| ***Question*** | The best evidence for the existence and movement of particles in liquids was provided by: |
| ***A)*** | John Dalton. |
| ***B)*** | Ernest Rutherford. |
| ***C)*** | J.J. Thomson. |
| ***D)*** | Robert Brown. |
| ***Correct Answer*** | Robert Brown. |
| ***Explanation*** | The best evidence for the existence and movement of particles in liquids was provided by the Robert Brown. For this experiment, he used pollen grains in water. |
| ***Difficulty Level*** | Hard |

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| ***Question*** | 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. |
| ***Correct Answer*** | The molecules in a liquid are arranged in a regular pattern. |
| ***Explanation*** | The above answer is not true because in liquids the molecules are not arranged in regular pattern. In liquids the molecules are loosely arranged. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | The evaporation of water increases under the following conditions: |
| ***A)*** | Increase in temperature, decrease in surface area. |
| ***B)*** | Increase in surface area, decrease in temperature. |
| ***C)*** | Increase in surface area, rise in temperature. |
| ***D)*** | Increase in temperature, increase in surface area, addition of common salt. |
| ***Correct Answer*** | Increase in surface area, rise in temperature. |
| ***Explanation*** | When surface area increases and temperature rises, evaporation of water increases because the area which is exposed to the outer atmosphere is more and increasing the temperature leads to increase in the kinetic energy, due to which rate of evaporation increases |
| ***Difficulty Level*** | Medium |

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| ***Question*** | For each of the following, use letters to indicate physical state of matter. ‘s’ for solid, ‘l’ for liquid ‘g’ for gaseous, 'p' for plasma, B.E.C. for Bose-Einstein Condensate. |
| ***A)*** | 1(p); 2(s); 3(l); 4(g); 5(B.E.C). |
| ***B)*** | 1(p); 2(s); 3(g); 4(l); 5(B.E.C). |
| ***C)*** | . 1(g); 2(s); 3(l); 4(p); 5(B.E.C). |
| ***D)*** | 1(p); 2(s); 3(l); 4(B.E.C); 5(g). |
| ***Correct Answer*** | 1(p); 2(s); 3(g); 4(l); 5(B.E.C). |
| ***Explanation*** |  |
| ***Difficulty Level*** | Hard |

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| ***Question*** | Which of the following process/ processes release heat?  1. Condensation.  2. Vaporization.  3. Freezing.  4. Melting. |
| ***A)*** | Only (i) |
| ***B)*** | Only (iv) |
| ***C)*** | (i) and (iii) |
| ***D)*** | (ii) and (iv) |
| ***Correct Answer*** | (i) and (iii) |
| ***Explanation*** | Both condensation and freezing release heat that lead to decrease in kinetic energy of molecules. When the substance gets cool enough its particles become slower or stop their movement and change their phase into liquid and solid on condensing and freezing respectively. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | A solid substance possess: |
| ***A)*** | Rigidity, fluidity and weak force of attraction. |
| ***B)*** | Rigidity, fluidity and fixed volume. |
| ***C)*** | Rigidity, fixed volume and high attractive forces of attraction. |
| ***D)*** | Rigidity, fixed shape and large intermolecular space between particles. |
| ***Correct Answer*** | . Rigidity, fixed volume and high attractive forces of attraction. |
| ***Explanation*** | SOLID:  1. strong intermolecular forces.  2. Particles vibrate in place.  3. low kinetic energy (KE).  4. Definite shape.  5. Definite volume.  6. Incompressible.  7. High density (as compared to same substance as a liquid or gas)  8. low rate of diffusion (millions of times slower than in liquids) may be crystalline or amorphous. |
| ***Difficulty Level*** | Medium |

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| ***Question*** | When water at 0°C freezes to form ice at the same temperature of 0°C, then it: |
| ***A)*** | Absorbs some heat. |
| ***B)*** | Releases some heat. |
| ***C)*** | Neither absorbs nor releases heat. |
| ***D)*** | Absorbs exactly 3.34 × 10 J/ kg of heat. |
| ***Correct Answer*** | Releases some heat. |
| ***Explanation*** | At 0°C, water releases some heat to lower the speed of molecules, and when it is cool enough the molecules of water are fixed at one position and they start vibrating. Ultimately, the water molecules convert into ice (solid). |
| ***Difficulty Level*** | hard |

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| ***Question*** | If the temperature of an object is 268K, it will be equivalent to: |
| ***A)*** | -5°C |
| ***B)*** | +5°C |
| ***C)*** | 368°C |
| ***D)*** | -25°C |
| ***Correct Answer*** | -5°C |
| ***Explanation*** | We have to subtract 273 from the given value to get the answer i.e. 268 - 273 = -5°C |
| ***Difficulty Level*** | Easy |

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| ***Question*** | When heat is constantly supplied by a gas burner with small flame to melt ice, then the temperature of ice during melting: |
| ***A)*** | Increases very slowly |
| ***B)*** | Does not increase at all |
| ***C)*** | First remains constant and then increases. |
| ***D)*** | . Increases to form liquid water. |
| ***Correct Answer*** | Does not increase at all. |
| ***Explanation*** | During melting, temperature of the ice does not change at all because the heat is used in overcoming the particle-particle attraction forces, which in turn keeps the temperature constant. |
| ***Difficulty Level*** | Medium |

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| ***Question*** | The latent heat of fusion of ice is: |
| ***A)*** | 3.34 × 105 J/ kg |
| ***B)*** | 22.5 × 105 J/ kg |
| ***C)*** | 3.34 × 104 J/ kg |
| ***D)*** | 22.5 × 104 J/ kg |
| ***Correct Answer*** | 3.34 × 104 J/ kg |
| ***Explanation*** | This value is fixed and is found by performing the experiment in lab |
| ***Difficulty Level*** | Hard |

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| ***Question*** | Dry ice is: |
| ***A)*** | Solid CO2. |
| ***B)*** | Water in solid state. |
| ***C)*** | Non-volatile solid. |
| ***D)*** | Liquid carbon dioxide. |
| ***Correct Answer*** | Solid CO2. |
| ***Explanation*** | Solid CO2 is called as dry ice. Dry ice is solid carbon dioxide. It is primarily used to cool food products at lower temperature than what water ice can provide. It is called dry ice because it sublimes and doesn't leave any residue i.e. changes from solid to gaseous state without turning to liquid. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | Which of the following are also considered to be the states of matter?  1.Plasma.  2.Platelets.  3.BFC.  4.BHC |
| ***A)*** | (i) and (ii) |
| ***B)*** | (ii) and (iii) |
| ***C)*** | (i) and (iii) |
| ***D)*** | (ii) and (iv) |
| ***Correct Answer*** | (i) and (iii) |
| ***Explanation*** | Plasma and BEC (Bose Einstein condensate) are also considered as states of matter because plasma is mixture of free atoms and ions and BEC occupies space and has mass. |
| ***Difficulty Level*** | Medium |

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| ***Question*** | In which of the following conditions, the distance between the molecules of hydrogen gas would increase?   1. Increasing pressure on hydrogen contained in a closed container. 2. Some hydrogen gas leaking out of the container. 3. Increasing the volume of the container of hydrogen gas. 4. Adding more hydrogen gas to the container without increasing the volume of the container. |
| ***A)*** | (i) and (ii). |
| ***B)*** | (i) and (iv). |
| ***C)*** | (ii) and (iii). |
| ***D)*** | (ii) and (iv). |
| ***Correct Answer*** | (ii) and (iii). |
| ***Explanation*** | (ii) and (iii) are the correct options because In option (ii) hydrogen gas leaking from the container leaves some vacant space inside the container. So, hydrogen gas molecules inside the container occupy all the space available and the distance between the molecules of hydrogen gas will be increased.  In option (iii) on increasing the volume of the container of hydrogen gas, more space will be available inside the container and hydrogen gas molecules will occupy all the space available and hence distance between the molecules will be increased. In option (i) on increasing pressure, hydrogen molecules will come closer and the distance between them will be decreased. In option (iv) more hydrogen gas molecules are available in less volume, so the distance between them will be decreased. |
| ***Difficulty Level*** | hard |

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| --- | --- |
| ***Question*** | 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)*** | 306K, 329K, 391K |
| ***B)*** | 308K, 329K, 392K |
| ***C)*** | 308K, 329K, 391K |
| ***D)*** | 329K, 392K, 308K |
| ***Correct Answer*** | 308K, 329K, 391K |
| ***Explanation*** | The correct order of boiling points of diethyl ether, acetone and n-butyl alcohol in kelvin scale is 308K,  329K and 391K,  which can be explained as (T°C + 273 = 7K).  Boiling point of diethyl ether = 35°C + 273 = 308K  Boiling point of acetone = 56°C + 273 = 329K  Boiling point of n-butyl alcohol = 118°C + 273 = 391K |
| ***Difficulty Level*** | Easy |

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| ***Question*** | Out of the following, an example of matter which can be termed as fluid is |
| ***A)*** | Carbon. |
| ***B)*** | Sulphur. |
| ***C)*** | Oxygen. |
| ***D)*** | Phosphorus. |
| ***Correct Answer*** | Oxygen |
| ***Explanation*** | Oxygen can be considered to be a fluid because oxygen is a gas and its particles are completely free to move. So, they have the ability to flow. |
| ***Difficulty Level*** | Medium |

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| ***Question*** | Effect of change of temperature on the physical state many be represented as:    What is X, Y and Z? |
| ***A)*** | . X = Liquid state, Y = Gaseous stage, Z = Solid state |
| ***B)*** | X = Solid state, Y = Gaseous state, Z = Liquid state |
| ***C)*** | X = Liquid state, Y = Solid state, Z = Gaseous state |
| ***D)*** | X = Solid state, Y = Liquid state, Z = Gaseous state |
| ***Correct Answer*** | X = Solid state, Y = Liquid state, Z = Gaseous state |
| ***Explanation*** |  |
| ***Difficulty Level*** | Hard |

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| ***Question*** | The common characteristics of solid and liquid states are: |
| ***A)*** | Both have fixed shape |
| ***B)*** | Both have fixed volume. |
| ***C)*** | Both are rigid |
| ***D)*** | Both have maximum force of attraction |
| ***Correct Answer*** | Both have fixed volume. |
| ***Explanation*** | A solid has definite volume and shape, a liquid has a definite volume but no definite shape, and a gas has neither a definite volume nor shape. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | Which one of the following statement is correct in respect of fluids? |
| ***A)*** | Only gases behave as fluids |
| ***B)*** | Gases and solids behave as fluids. |
| ***C)*** | Gases and liquids behave as fluids. |
| ***D)*** | Only liquids are fluids. |
| ***Correct Answer*** | Gases and liquids behave as fluids. |
| ***Explanation*** | Gases and liquids behave as fluids because fluids are the substances that have the ability to flow. Gases and liquids can flow easily because their particles are free to move. |
| ***Difficulty Level*** | Medium |

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| ***Question*** | Choose the incorrect statement: |
| ***A)*** | We should wear cotton clothes in summer. |
| ***B)*** | Plasma is superenergetic and superexcited particle. |
| ***C)*** | B.E.C. (Bose-Einstein Condensate) are formed by cooling gas of very low density at super low temperature |
| ***D)*** | Terylene can absorb sweat more than cotton. |
| ***Correct Answer*** | Terylene can absorb sweat more than cotton. |
| ***Explanation*** | Lightweight cotton is one of the most breathable fabrics and offers some airflow for drying out the dampness. Because cotton is a natural fiber, it absorbs moisture rather than repelling it (forcing the sweat to sit on your skin). Since it absorbs moisture so easily, pit stains are often a problem.  Fibres coming out from fabric Natural fibres are blended with synthetic fibres to obtain more superior and useful.  Fibres: These are called mixed fibres. Some well-known mixed fibres are tricot (terylene + cotton), berry silk (terylene + silk) and try wool (terylene + wool). Terry silk cloth Terrycot cloth. |
| ***Difficulty Level*** | Hard |

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| ***Question*** | When heat is constantly supplied by a burner to boiling water, then the temperature of water during vaporisation: |
| ***A)*** | Rises very slowly. |
| ***B)*** | Rises rapidly until steam is produced. |
| ***C)*** | . First rises and then becomes constant. |
| ***D)*** | Does not rise at all. |
| ***Correct Answer*** | Does not rise at all. |
| ***Explanation*** | Temperature of the water during vaporisation does not change at all because the heat is used in overcoming particle-particle attraction forces, which in turn keeps the temperature constant. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | During respiration, glucose and oxygen enter our body cells and waste products carbon dioxide and water leave the body cells by the process of: |
| ***A)*** | Effusion. |
| ***B)*** | Osmosis. |
| ***C)*** | Diffusion. |
| ***D)*** | Plasmolysis. |
| ***Correct Answer*** | Diffusion. |
| ***Explanation*** | Because diffusion is a process in which there is a movement of particles from a region of high concentration to the one with low concentration across the cell membrane. |
| ***Difficulty Level*** | Medium |

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| ***Question*** | Find out the incorrect increasing/decreasing order in the following: |
| ***A)*** | Force of attraction: Oxygen < water < sugar |
| ***B)*** | Increasing intermolecular space: Solids < liquids < gases |
| ***C)*** | Diffusion: Solid < liquid < gas |
| ***D)*** | Kinetic energy: Hydrogen > honey > water |
| ***Correct Answer*** | Kinetic energy: Hydrogen > honey > water |
| ***Explanation*** | because as we know that kinetic energy of the gases is maximum, liquid is intermediate and solids is minimum. Hence, the order is Hydrogen (gas) > honey (solid but has high density than water) > water. |
| ***Difficulty Level*** | Hard |

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| ***Question*** | 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)*** | 306K, 329K, 391K. |
| ***B)*** | 308K, 329K, 392K. |
| ***C)*** | 308K, 329K, 391K |
| ***D)*** | 329K, 392K, 308K |
| ***Correct Answer*** | 308K, 329K, 391K. |
| ***Explanation*** | Each Celsius measurement can be converted to a Kelvin measurement by adding 273. So, 35°C + 273 = 308K, 56°C + 273 = 329 K, 118°C + 273 = 391K. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | Find out the correct sentence |
| ***A)*** | Enzymes packed in lysosomes are made through RER (Rough Endoplasmic Reticulum). |
| ***B)*** | Rough endoplasmic reticulum and smooth endoplasmic reticulum produce lipid and protein respectively. |
| ***C)*** | Endoplasmic reticulum is related with the destruction of plasma membrane. |
| ***D)*** | Nucleoid is present inside the uncleoplasm of eukaryotic nucleus. |
| ***Correct Answer*** | Enzymes packed in lysosomes are made through RER (Rough Endoplasmic Reticulum). |
| ***Explanation*** | The undefined nuclear region is the cytoplasm of prokaryotic cells is called nucleoid.  The prokaryotic cells consist of a single chromosome, which is direct content of the cytoplasm i.e., there is no nuclear membrane in a eukaryotic cell, the nuclear envelope separates the nucleus from the cytoplasm.  The nuclear envelope contains many pores (the nuclear pores) and encloses the liquid ground substance, the nucleoplasm. Within nucleoplasm two types of nuclear structures are embedded-the nucleolus and chromatin material.  The nucleolus may be one or more in number and is not bounded by any membrane. It is rich in protein and RNA (Ribonucleic Acid) molecules and acts as the site for ribosome formation, hence are also known as factory of ribosomes. |
| ***Difficulty Level*** | Medium |

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| ***Question*** | 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 |
| ***Correct Answer*** | Gases and liquids behave like fluids. |
| ***Explanation*** | In both gases and liquids, inter-molecular forces of attraction and intermolecular spaces are such that they facilitate the flow of these states of matter. |
| ***Difficulty Level*** | Hard |

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| ***Question*** | 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. |
| ***Correct Answer*** | Low temperature, high pressure. |
| ***Explanation*** | Low temperature and high pressure are required to liquefy gases to liquids. There is a lot of space between the particles of a gas. On applying high pressure, the particles of gas move get so close that they start attracting each other sufficiently forming a liquid.  When gas is compressed too much, heat is produced, so it is necessary to cool it. Cooling lowers the temperature of compressed gas and helps in liquefying it. Hence, a gas can be liquefied by applying high pressure and lowering the temperature (cooling). |
| ***Difficulty Level*** | Medium |

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| ***Question*** | Which of the following is not correct about evaporation? |
| ***A)*** | It is surface phenomenon. |
| ***B)*** | It takes place at all temperatures. |
| ***C)*** | It causes cooling as it takes heat from surroundings. |
| ***D)*** | Its rate decreases with decrease in humidity. |
| ***Correct Answer*** | Its rate decreases with decrease in humidity. |
| ***Explanation*** | **Temperature**: The rate of evaporation increases with an increase in temperature.  **Surface area:** The rate of evaporation increases with an increase in surface area.  **Humidity:** The amount of water vapour present in the air is called humidity. The rate of evaporation decreases with an increase in humidity.  **Wind speed**: Evaporation increases with an increase in wind speed. |
| ***Difficulty Level*** | Hard |

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| ***Question*** | One of the following does not undergo sublimation. This one is: |
| ***A)*** | Iodine. |
| ***B)*** | . Sodium chloride. |
| ***C)*** | Ammonium chloride. |
| ***D)*** | Camphor. |
| ***Correct Answer*** | Sodium chloride. |
| ***Explanation*** | Sodium chloride does not undergo sublimation because it does not show direct change from solid state to liquid state. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | You are given the following substances with their boiling and melting points.    Point out the physical states of A, B and C at room temperature (30°C). |
| ***A)*** | A-Gas, B-Solid, C-Liquid |
| ***B)*** | A-Gas, B-Liquid, C-Solid |
| ***C)*** | A-Liquid, B-Solid, C-Gas |
| ***D)*** | A-Solid, B-Liquid, C-Gas |
| ***Correct Answer*** | A-gas, B-sold and C-liquid |
| ***Explanation*** |  |
| ***Difficulty Level*** | Medium |

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| ***Question*** | 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. |
| ***Correct Answer*** | Evaporation, diffusion, expansion of gases. |
| ***Explanation*** | Evaporation, diffusion and expansion of gases increase on raising the temperature.Evaporation rate increases because on increasing temperature, kinetic energy of molecules increases, so the molecules present at the surface of the liquid leave the surface quickly and go into the vapour state. Diffusion and expansion of gases also increase as the molecules move more rapidly and try to occupy more space. |
| ***Difficulty Level*** | hard |

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| ***Question*** | Which cell organelle plays a crucial role in detoxifying many poisons and drugs in a cell? |
| ***A)*** | Golgi apparatus. |
| ***B)*** | Lysosomes. |
| ***C)*** | Smooth endoplasmic reticulum. |
| ***D)*** | Vacuoles. |
| ***Correct Answer*** | Smooth endoplasmic reticulum. |
| ***Explanation*** | In the liver cells of vertebrate, SER plays an important role in detoxifying many poisons and drugs. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | Which of the following energy is absorbed during the change of state of a substance? |
| ***A)*** | Specific heat. |
| ***B)*** | Latent heat. |
| ***C)*** | Heat capacity. |
| ***D)*** | Heat of solution. |
| ***Correct Answer*** | Latent heat. |
| ***Explanation*** | Latent heat is absorbed because during change of state because it is the heat energy that has to be supplied to change the state of a substance. |
| ***Difficulty Level*** | Medium |

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| ***Question*** | The latent heat of vaporization of water is: |
| ***A)*** | 22.5 × 106 J/ kg |
| ***B)*** | 3.34 × 10 J/ kg |
| ***C)*** | 22.5 × 10 J/ kg |
| ***D)*** | 3.34 × 10 J/ kg |
| ***Correct Answer*** | 22.5 × 10 J/ kg |
| ***Explanation*** | This value is fixed and is found by performing the experiment in the lab. |
| ***Difficulty Level*** | Hard |

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| ***Question*** | Which one of the following set 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. |
| ***Correct Answer*** | . Evaporation, diffusion, expansion of gases. |
| ***Explanation*** | The rates of evaporation, diffusion and expansion of gases increases due to increase in temperature because when temperature increases the kinetic energy of molecules increases, which breaks or weakens the interaction between the atoms and sets the molecules free. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | Which of the following represent the suitable condition for the liquefaction of gases? |
| ***A)*** | Low temperature, low pressure. |
| ***B)*** | High temperature, low pressure |
| ***C)*** | Low temperature, high pressure. |
| ***D)*** | High temperature, high pressure |
| ***Correct Answer*** | Low temperature, high pressure. |
| ***Explanation*** | With the help of experiments it can be shown that at low temperature and high pressures, gases will liquefy. Because these factors affect the interaction force of molecules i.e. the molecules are able to establish a force of attraction between them on lowering the temperature and increasing pressure. |
| ***Difficulty Level*** | Medium |

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| ***Question*** | The conversion of a solid into vapours without passing through the liquid state is called: |
| ***A)*** | Vaporization. |
| ***B)*** | Fusion. |
| ***C)*** | Sublimation. |
| ***D)*** | Freezing. |
| ***Correct Answer*** | Sublimation. |
| ***Explanation*** | The transformation of a solid directly into vapour, on heating, is known as sublimation. |
| ***Difficulty Level*** | Hard |

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| ***Question*** | When a crystal of potassium permanganate is placed at the bottom of water in a beaker, the water in the whole beaker turns purple on its own, even without stirring. This is an example of: |
| ***A)*** | Distribution. |
| ***B)*** | Intrusion. |
| ***C)*** | Diffusion. |
| ***D)*** | Effusion. |
| ***Correct Answer*** | Diffusion. |
| ***Explanation*** | Both water and potassium permanganate are made up of tiny particles. The particles of potassium permanganate are coloured while those of water are colorless. When the crystals of potassium permanganate are kept in water, the purple-coloured crystals of potassium permanganate break further into smaller particles that occupy the space between the molecules of water imparting a purple colour to the water. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | A few substances are arranged in the increasing order ‘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 |
| ***Correct Answer*** | Oxygen, water, sugar |
| ***Explanation*** | The force of attraction between the particles increases as we go from liquid to gas so the required order is: Oxygen<water<sugar |
| ***Difficulty Level*** | Medium |

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| ***Question*** | During summer days, water kept in an earthen pot (pitcher) becomes cool because of the phenomenon of: |
| ***A)*** | Diffusion |
| ***B)*** | Transpiration. |
| ***C)*** | Osmosis. |
| ***D)*** | Evaporation. |
| ***Correct Answer*** | Evaporation. |
| ***Explanation*** | An earthen pot has a large number of extremely small pores on its wall. Some of the water continuously keeps seeping through these pores. This water evaporates continuously and takes the latent heat required for vaporization from the earthen pot and the remaining water. In this way, the remaining water loses heat and gets cooled. |
| ***Difficulty Level*** | Hard |

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| ***Question*** | 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. |
| ***Correct Answer*** | Conversion of vapours into solid without passing through the liquid state is called sublimation |
| ***Explanation*** | Sublimation is the change of solid/ gas phase directly from the solid/ gas phase to the gaseous/ solid phase without passing through the intermediate liquid phase. |
| ***Difficulty Level*** | Easy |

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| ***Question*** | A gas fills completely the vessel in which it is kept, because: |
| ***A)*** | Of weak intermolecular attractive forces. |
| ***B)*** | Of strong intermolecular attractive forces. |
| ***C)*** | Of very weak intermolecular repulsive forces |
| ***D)*** | Of rigidity. |
| ***Correct Answer*** | Of very weak intermolecular repulsive forces. |
| ***Explanation*** | The force of attraction between particles of gas is negligible. Because of this, particles of gas move in all directions. Thus, a gas fills the vessel completely in which it is kept. |
| ***Difficulty Level*** | Medium |