

LIST OF RADICALS**VALENCY OF IONS :**

The valency of an ion is same as the charge present on the ion.

If an ion has 1 unit of positive charge, its valency is +1 and it is known as a monovalent cation. If an ion has 2 units of negative charge, its valency is –2 and it is known as a divalent anion.

LIST OF COMMON ELECTROVALENT RADICALS

| Monovalent Electropositive | | Bivalent Electropositive | | Trivalent Electropositive | | Tetravalent Electropositive | |
|----------------------------|------------------------------|----------------------------|------------------|---------------------------|------------------|-----------------------------|------------------|
| 1. Hydrogen | H ⁺ | 1. Magnesium | Mg ²⁺ | 1. Aluminium | Al ³⁺ | 1. Stannic [Tin (IV)] | Sn ⁴⁺ |
| 2. Ammonium | NH ₄ ⁺ | 2. Calcium | Ca ²⁺ | 2. Ferric [Iron (III)] | Fe ³⁺ | 2. Plumbic [Lead (IV)] | Pb ⁴⁺ |
| 3. Sodium | Na ⁺ | 3. Zinc | Zn ²⁺ | 3. Chromium | Cr ³⁺ | | |
| 4. Potassium | K ⁺ | 4. Plumbous [Lead (II)] | Pb ²⁺ | | | | |
| 5. Cuprous [(Copper (I))] | Cu ⁺ | 5. Cupric [(Copper (II))] | Cu ²⁺ | | | | |
| 6. Argentous [Silver (I)] | Ag ⁺ | 6. Argentate [Silver(II)] | Ag ²⁺ | | | | |
| 7. Mercurous [Mercury(I)] | Hg ₂ ⁺ | 7. Stannous [Tin (II)] | Sn ²⁺ | | | | |
| | | 8. Ferrous [Iron (II)] | Fe ²⁺ | | | | |
| | | 9. Mercuric [Mercury (II)] | Hg ²⁺ | | | | |
| | | 10. Barium | Ba ²⁺ | | | | |

| Monovalent Electronegative | | Bivalent Electronegative | | Trivalent Electronegative | | Tetravalent Electronegative | |
|--------------------------------------|----------------------------------|--------------------------|--|---------------------------|-------------------------------|-----------------------------|-----------------|
| 1. Fluoride | F ⁻ | 1. Sulphate | SO ₄ ²⁻ | 1. Nitride | N ³⁻ | 1. Carbide | C ⁴⁻ |
| 2. Chloride | Cl ⁻ | 2. Sulphite | SO ₃ ²⁻ | 2. Phosphide | P ³⁻ | | |
| 3. Bromide | Br ⁻ | 3. Sulphide | S ²⁻ | 3. Phosphite | PO ₃ ³⁻ | | |
| 4. Iodide | I ⁻ | 4. Thiosulphate | S ₂ O ₃ ²⁻ | 4. Phosphate | PO ₄ ³⁻ | | |
| 5. Hydride | H ⁻ | 5. Zincate | ZnO ₂ ²⁻ | | | | |
| 6. Hydroxide | OH ⁻ | 6. Oxide | O ²⁻ | | | | |
| 7. Nitrite | NO ₂ ⁻ | 7. Peroxide | O ₂ ²⁻ | | | | |
| 8. Nitrate | NO ₃ ⁻ | 8. Dichromate | Cr ₂ O ₇ ²⁻ | | | | |
| 9. Bicarbonate or Hydrogen carbonate | HCO ₃ ⁻ | 9. Carbonate | CO ₃ ²⁻ | | | | |
| 10. Bisulphite or Hydrogen sulphite | HSO ₃ ⁻ | 10. Silicate | SiO ₃ ²⁻ | | | | |
| 11. Bisulphide or Hydrogen sulphide | HS ⁻ | | | | | | |
| 12. Bisulphate or Hydrogen sulphate | HSO ₄ ⁻ | | | | | | |
| 13. Acetate | CH ₃ COO ⁻ | | | | | | |

MATTER IN OUR SURROUNDINGS

DPP NO. 01

TOPIC : PHYSICAL PROPERTIES AND STATES OF MATTER

1. The conclusion which can be drawn from the given figures is



- (A) Liquids have one free surface
(B) Liquids take the shape of vessel
(C) Same amount of liquid have same level in different container
(D) both A and B
2. The magnitude of intermolecular forces of attraction are maximum in
(A) chalk powder (B) water (C) carbon dioxide (D) hydrogen
3. By increasing pressure, the _____ of gas decreases.
(A) weight (B) temperature (C) mass (D) volume
4. When molecules gain enough energy they
(A) move away from each other (B) come close to each other
(C) remain at the same position (D) none of these
5. Which of the following statement goes well with the liquid state ?
(A) particles are loosely packed in the liquid state.
(B) fluidity is maximum in the liquid state.
(C) liquids can be compressed easily.
(D) liquids don't take up the shape of any container in which these are placed.
6. Which state has lower density ?
(A) solid (B) liquid (C) gas (D) Either of these
7. Which condition out of the following will increase the vapor pressure of ether ?
(A) Increase in temperature of ether (B) Decrease in temperature of ether
(C) Increase in exposed surface area of ether (D) None of these
8. Which of the following are rigid forms of matter ?
(A) only solids (B) only liquids (C) solids and liquids (D) liquids and gases
9. The decreasing order of kinetic energy of particles is
(A) solid > liquid > gas (B) gas > liquid > solid (C) liquid > solid > gas (D) gas > solid > liquid
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
11. What out of iron and chalk which has stronger inter-particle forces ?
12. Ravi wants to buy shirts for summer. Should he buy cotton shirts or shirts made from synthetic material ? Give suggestion to Ravi by giving proper logical explanation.
13. Explain the reason behind rigidity property in solids.
14. A gas fills completely the vessel in which it is kept. Give reason.
15. Explain boiling point in terms of vapor pressure.

DPP NO. 02

TOPIC : INTER CONVERSION OF STATES OF MATTER

1. Correct pair of substances that undergoes sublimation is
(A) bromine and iodine (B) dry ice and nausadar
(C) sodium and borax (D) naphthalene and blue vitriol

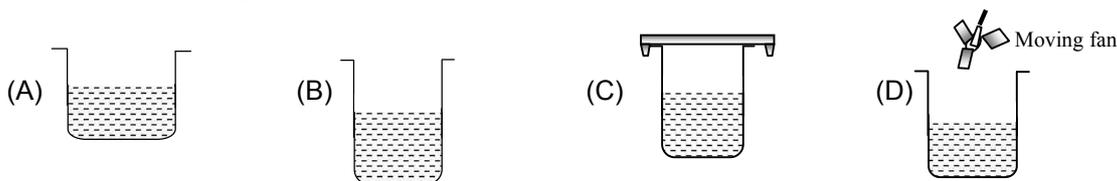
2. The boiling point of alcohol is 78°C . What will be the value of this temperature in Kelvin scale ?
(A) 373 K (B) 351 K
(C) 341 K (D) 78 K
3. At higher altitude the boiling point of water lowers because -
(A) atmospheric pressure is low. (B) temperature is low.
(C) atmospheric pressure is high. (D) None of these
4. The temperature at which a liquid starts converting into solid without any rise in temperature is called -
(A) melting point (B) boiling point
(C) freezing point (D) none of these
5. A gas can be best liquefied
(A) by increasing the temperature
(B) by lowering the pressure
(C) by increasing the pressure and reducing the temperature
(D) none of the above
6. Boiling point of 1% aqueous solution of common salt at atmospheric pressure is
(A) 100°C (B) $> 100^{\circ}\text{C}$ (C) $< 100^{\circ}\text{C}$ (D) not possible to tell
7. In which of the following cities would there be maximum water vapor in the air on a sunny day in December ?
(A) Srinagar (B) Delhi (C) Bhopal (D) Kochi
8. Freezing point of water is
(A) 1°C (B) 0°C (C) 273.15 K (D) B and C both
9.of a substance remains constant when it changes from one state to another at its melting or boiling point.
(A) Volume (B) Pressure (C) Temperature (D) Density
10. What characteristics of substances enable us to determine that a given sample is pure or not ?
(A) Boiling point (B) Melting point (C) Both A & B (D) None of these
11. How does sweating or perspiration helps in keeping our body cool on a hot day.
12. Explain why ice at 0°C is more effective in cooling than water at the same temperature.
13. Suggest a method to liquefy atmospheric gases.
14. An inflated air balloon deflates when pricked with a pin. Which property of the gaseous state is shown by this activity?
15. Kelvin scale of temperature is regarded as better than the Celsius scale by scientists. Can you give any reason for the same?

DPP NO. 03

TOPIC : EVAPORATION AND FACTORS AFFECTING IT

1. The rate of evaporation
(A) decreases with a rise in temperature (B) increases with an increase in surface area
(C) increases with increase in humidity (D) decreases with increase in the wind speed
2. Which of the following statements is not correct ?
(A) Evaporation is a surface phenomenon
(B) Evaporation takes place at all temperatures
(C) The temperature of a boiling liquid remains constant
(D) Boiling of a liquid involves formation of bubbles only at the surface of the liquid
3. Evaporation of a liquid occurs at
(A) boiling point (B) melting point (C) any temperature (D) freezing point
4. Rate of evaporation is lowest in
(A) Summers (B) Rainy season (C) Autumn season (D) Spring season

5. Which of the following factor(s) affect rate of evaporation
(A) Temperature (B) Surface area (C) Both A and B (D) None of these
6. On increasing the temperature of the liquid
(A) The rate of evaporation increases (B) Volume of liquid decreases
(C) Kinetic energy increases (D) All of these
7. During summer, water kept in an earthen pot becomes cool because of the phenomenon of
(A) diffusion (B) liquefaction (C) osmosis (D) evaporation
8. Choose the correct statement from below
(A) Evaporation is a surface phenomenon
(B) Ice at 273 K is less effective for cooling than water at 273 K
(C) Water at 373 K is more effective for heating than steam at 373 K
(D) Boiling of a liquid is surface phenomenon
9. Look at the following figures and suggest in which vessel rate of evaporation will be highest ?



10. 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
11. Why does evaporation causes cooling effect ?
12. Does evaporation occurs only at a fixed temperature ?
13. We sweat more on a humid day. Support the statement with reason.
14. Wet clothes do not dry easily on a rainy day. Why ?
15. Doctors advice to put strips of wet cloth on the forehead of a person having high fever. Why ?

IS MATTER AROUND US PURE ?

DPP NO. 04

TOPIC : ELEMENTS, COMPOUNDS AND MIXTURES

1. Which of the following does not contain any chemical substance ?
(A) air (B) water (C) light (D) a pure diamond crystal
2. Two substances, A and B were made is react to form a third substance, A_2B according to following reaction
$$2A + B \rightarrow A_2B$$

Which of the following statements concerning this reaction are incorrect ?
(i) The product A_2B shows the properties of substances A and B.
(ii) The product will always have a fixed composition.
(iii) The product so formed cannot be classified as a compound.
(iv) The product so formed is an element.
(A) i, ii and iii (B) ii, iii and iv (C) i, iii and iv (D) i, ii and iv
3. Two chemical species X and Y combine together to form a product P which contains both X and Y. X and Y cannot be broken down into simpler substances by simple chemical reactions. Which of the following concerning the species X, Y and P are correct ?
(i) P is a compound (ii) X and Y are compounds
(iii) X and Y are elements (iv) P has a fixed composition
(A) i, ii and iii (B) i, ii and iv (C) ii, iii and iv (D) i, iii and iv
4. The elements which give out harmful radiation are called
(A) normal elements (B) representative elements
(C) radioactive elements (D) none of these

5. Which of the following is a pure substance ?
(A) Milk (B) Sea water (C) Soil (D) Copper
6. Which of the following is not a compound ?
(A) marble (B) washing soda (C) quick lime (D) brass
7. Which of the following is not a metal ?
(A) Copper (B) Silver (C) Lead (D) Germanium
8. What is a chemical compound ?
(A) a subatomic particle
(B) a combination of two protons and two electrons
(C) a combination of two or more chemical elements
(D) a mixture of two or more substances
9. Identify homoatomic molecule element from the following
(A) air (B) iodine vapors (C) water (D) amalgam
10. Which of the following can be classified as a compound ?
(A) milk (B) sea-water (C) ice (D) cast iron
11. Which of the substances from the following are pure substances - milk, iron, hydrochloric acid, mercury, wood, air.
12. In water, hydrogen and oxygen are present in ratio 1:8. Calculate the amount of Oxygen which completely react with 10g of Hydrogen to form water
13. Is copper sulphate a mixture or a compound. Why ?
14. "Properties of compounds is different from the properties of its constituent elements". Justify the statement.
15. Differentiate between homogeneous and heterogeneous mixture.

DPP NO. 05

TOPIC : TYPES OF MIXTURES, CONCENTRATION OF SOLUTIONS

1. Which of the following is mixture?
(A) sea water (B) water (C) ice (D) water vapor
2. Which of the following are homogeneous in nature?
(i) Ice (ii) Wood (iii) Soil (iv) Air
(A) i and iii (B) ii and iv (C) i and iv (D) iii and iv
3. A true solution of sugar and water is prepared. A student observed that it is -
(A) homogeneous (B) transparent (C) milky white (D) Both A and B
4. The amount of glucose required to prepare 250 g of 5 % solution of glucose by mass will be -
(A) 10 g (B) 12.5 g (C) 25 g (D) 5 g
5. Which of the following will be a heterogeneous mixture?
(A) common salt + water (B) cane sugar + Water
(C) alum + water (D) albumin + water
6. Which of the following is a homogenous mixture?
(A) stainless steel (B) iodized salt
(C) gun powder (D) a suspension of chalk in water
7. Brass is a
(A) compound (B) element
(C) homogeneous mixture (D) heterogeneous mixture
8. Tincture of iodine has antiseptic properties. This solution is made by dissolving
(A) iodine in potassium iodide (B) iodine in vaseline
(C) iodine in water (D) iodine in alcohol

9. Which of the following provides an example of a true solution ?
(A) blood (B) milk (C) starch solution (D) sugar solution
10. Which of the following statement is not true about true solution ?
(A) It can pass through filter paper.
(B) It is homogeneous in nature.
(C) At constant temperature, particles of solute settle down.
(D) Solute can easily be recovered by evaporation or crystallization from a true solution.
11. What happens when saturated solution is heated ?
12. Why is solid CaCl_2 spread on roads in cold countries ?
13. How can you say that brass is a mixture not a compound.
14. Is 22 carat gold mixture ?
15. To make saturated solution, 36 g of sodium chloride is dissolved in 100 g of water at 293 K, then calculate the concentration (by mass) at this temperature ?

DPP NO. 06
TOPIC : TYPES OF SOLUTIONS

1. A liquid and a solid together in a single phase is known as -
(A) solution (B) solute (C) solvent (D) emulsion
2. Which of the following is a homogeneous system ?
(A) muddy water (B) bread
(C) concrete (D) a solution of sugar in water
3. Drinking soda is an example of a solution of -
(A) gas in liquid (B) liquid in gas (C) gas in gas (D) solid in liquid
4. Amalgam is a solution of -
(A) solid in solid (B) solid in liquid (C) liquid in solid (D) liquid in liquid
5. Which of the following is expected to conduct electricity ?
(A) diamond (B) molten sulphur
(C) molten KCl (D) crystalline NaCl
6. Select the odd one -
(A) hydrogen (B) oxygen (C) steam (D) chlorine
7. Which of the following is a characteristic of both mixtures and compounds ?
(A) They contain components in fixed proportions
(B) Their properties are the same as those of their components
(C) Their weight equals the sum of the weights of their components
(D) Energy is given out when they are being prepared
8. How many grams of hydrochloric acid are formed when 2 grams of hydrogen combine with excess of chlorine ?
(A) 35.5 gm (B) 36.5 gm (C) 73 gm (D) 37.7 gm
9. Which of the following is an example of a mixture ?
(A) sugar (B) brass (C) CO_2 (D) NO_2
10. Which of the following obey the law of constant proportion in their formation ?
(A) mixtures (B) compounds (C) elements (D) colloids
11. Explain Tyndall effect with example.
12. A solution contains 110 g of sugar in 500 g of water. Calculate the concentration in terms of mass by mass percentage of the solution.
13. The solubility of NaCl is 35. Calculate the max amount of NaCl that can be dissolved in 400g of NaCl.
14. What would you observe when
(a) A saturated solution of potassium chloride prepared at 60°C is allowed to cool at room temperature.
(b) An aqueous sugar solution is heated to dryness.

15. (a) Define the terms solute, solvent and solution. When is a solution said to be saturated ?
(b) State two ways by which a saturated sugar solution can be made unsaturated.

DPP NO. 07

TOPIC : SEPARATION TECHNIQUES

1. Which of the following methods is used for obtaining pure solid from its impure form ?
(A) sublimation (B) crystallization
(C) diffusion (D) both A and B
2. Separation of NH_4Cl from sand can be made on the basis of –
(A) winnowing (B) sublimation
(C) filtration (D) none of these
3. In which of the following can filtration separate the components of the mixture ?
(A) starch and water (B) alum and water
(C) sand and water (D) both A and C
4. Which of the following mixtures will be the most difficult to separate ?
(A) iron fillings + sand (B) sand + water
(C) saw dust + stones (D) nitrogen + hydrogen
5. What will be the sublimate obtained when a mixture of sand, sulphur, common salt and iodine is kept in open air ?
(A) sand (B) iodine
(C) sulphur (D) common salt
6. The cream can be separated from the milk by the process of
(A) filtration (B) evaporation
(C) centrifugation (D) decantation
7. The process of obtaining pure crystals of copper sulphate from aqueous solution of copper sulphate solution is known as
(A) crystallization (B) galvanization
(C) rusting (D) None of these
8. Which of the following pass through filter paper unchanged
(A) soil and water (B) common salt and water
(C) both A and B (D) None of these
9. Ferrous sulphate is formed –
(A) by heating iron filings with sulphuric acid
(B) by heating iron filings with sulphur
(C) by the reaction of mixture of iron filings and sulphur with dilute hydrochloric acid
(D) by the reaction of iron with hydrogen sulphide gas
10. To separate sulphur from Iron filings, the solvent used is
(A) carbon disulphide (B) chloroform
(C) alcohol (D) water
11. Explain the principal behind separation of immiscible liquids.
12. Suggest a suitable technique for the separation of the following
(i) Ammonium chloride and sand (ii) Mixture of ethyl alcohol and water
13. Two miscible liquids A and B are present in a solution. The boiling point of A is 60°C while that of B is 90°C . Suggest a method of separate them.
14. Name the technique that you will apply for the separation of different pigments from an extract of flower petals.
15. The boiling points of argon, nitrogen and oxygen are -180°C , -196°C and -183°C respectively. Which of these gases will distill first from their mixture in air ? Justify your answer.

DPP NO. 08

TOPIC : PHYSICAL AND CHEMICAL CHANGES

1. Rusting of an article made up of iron is called
(A) corrosion and it is a physical as well as chemical change.
(B) dissolution and it is a physical change.
(C) corrosion and it is a chemical change.
(D) dissolution and it is a chemical change.
2. Which of the following are chemical changes ?
(i) decaying of wood. (ii) burning of wood.
(iii) sawing of wood. (iv) hammering of a nail into a piece of wood.
(A) i and ii (B) ii and iii (C) iii and iv (D) i and iv
3. Which of the following are physical changes ?
(i) melting of iron metal. (ii) rusting of iron.
(iii) bending of an iron and (iv) drawing a wire of iron metal.
(A) i, ii and iii (B) i, ii and iv (C) i, iii and iv (D) ii, iii and iv
4. Which of the following is a chemical changes ?
(A) Twinkling of stars (B) Cooking of vegetables (C) Cutting of fruits (D) Boiling of water
5. Which of the following is not a chemical change ?
(A) Rusting of iron (B) Cooking of food (C) Freezing of water (D) Sugar solution
6. Which of the following is a chemical change ?
(A) souring of milk (B) stretching of rubber (C) melting of wax (D) magnetization of iron
7. Identify a physical change among the following
(A) respiration (B) digestion of food (C) burning of wax (D) glowing of an electric bulb
8. What is observed when iron nails are added to copper sulphate solution ?
(A) The solution becomes pale green and reddish brown deposit is seen on the nails.
(B) The solution becomes colorless.
(C) There is no reaction.
(D) The solution becomes pale green and no change is observed in the iron nails.
9. What is the color of precipitate when sodium sulphate is added to a solution of barium chloride ?
(A) Brown (B) Black (C) Blue (D) White
10. The gas evolved during reaction of zinc with dilute H_2SO_4 acid is
(A) a supporter of combustion (B) a potential fuel
(C) non-combustible (D) soluble in water
11. Write any two differences between physical and chemical change.
12. Burning of coal is physical change or chemical change. Comment.
13. Identify physical and chemical changes from the following :
Rusting of iron, cooking of food, freezing of water, burning of candle, melting of wax, glowing of a bulb.
14. On heating calcium carbonate gets converted to calcium oxide and carbon dioxide.
(a) Is this a physical or a chemical change.
(b) Can you prepare one acidic and one basic solution by using the products formed in the above process ? If so, write the chemical equation involved.
15. Classify each of the following as a physical or chemical change. Give reasons -
(a) Drying of a shirt in the sun. (b) Rising of hot air over a radiator.
(c) Burning of kerosene in a lantern. (d) Change in the color of black tea on adding juice to it.
(e) Churning of milk cream to get butter.

ATOMS AND MOLECULES

DPP NO. 09

TOPIC : DALTON'S THEORY, LAWS OF CHEMICAL COMBINATION, SYMBOLS AND ATOMIC MASS

- The atomic theory of matter was proposed by
(A) Lavoisier (B) Proust
(C) John Dalton (D) None of these
- The English name of an element is Sodium, It's Latin name is
(A) Plumbum (B) Ferrum
(C) Natrium (D) Kalium
- The successful method of forming the symbols of elements was proposed by :
(A) Dalton (B) Lavosier
(C) Berzelius (D) Proust
- In carbon monoxide the proportion of carbon and oxygen by mass is
(A) 2 : 8 (B) 8 : 1 (C) 3 : 4 (D) 1 : 1
- The element having atomicity 'eight' is most likely to be
(A) Phosphorus (B) Neon (C) Sulphur (D) Chlorine
- The law of conservation of mass was proposed by
(A) John Dalton (B) Berzelius (C) Lavosier (D) Proust
- A particle has 11 protons, 12 neutrons and 10 electrons. The particle is most likely to be
(A) A molecule (B) An atom (C) A cation (D) An anion
- A particle has 8 protons, 8 neutrons and 10 electrons, the particle is most likely to be
(A) An anion (B) A cation (C) An atom (D) A molecule
- The formula of a compound is XY_2 . The valencies of X and Y will be respectively
(A) 1 and 3 (B) 2 and 4 (C) 2 and 1 (D) 3 and 2
- The atomic number of an element A is 12. The number of electrons in its A^{2+} ion will be
(A) 12 (B) 10 (C) 14 (D) 15
- What do you mean by valency ? Also, give some examples for those elements which show variable valencies.
- Define Gram atomic mass.
- Every molecule of ammonia always has formula NH_3 irrespective of method of preparation or sources i.e. 1 mole of ammonia always contains 1 mol. of N and 3 mole H. In others words 17 g of NH_3 always contains 14 g of N and 3 g of H. Now find out % of each element in the compound.
- 1.80 g of a certain metal burnt in oxygen gave 3.0 g of its oxide; 1.50 g of the same metal heated in steam gave 2.50 g of its oxide. Show that these results illustrate the law of constant proportion.
- The atomic weights of two elements A and B are 40 and 80 respectively. If x g of A contains y atom, how many atoms are present in 2x g of B ?

DPP NO. 10

TOPIC : Mole Concept

- 44 g of CO_2 at NTP will occupy volume equal to
(A) 44 mL (B) 44 L (C) 22.4 mL (D) 22. 4L
- Number of molecules present in 0.18 g H_2O are
(A) $0.18 \times 6.023 \times 10^{23}$ (B) $18 \times 6.023 \times 10^{23}$ (C) 6.023×10^{23} (D) 6.023×10^{21}
- The percentage of sodium in a breakfast cereal labelled as 110 mg of sodium per 100 g of cereal is
(A) 11% (B) 1.10% (C) 0.110% (D) 110%

4. Which of the following sample contains the maximum number of atoms ?
(A) 1 mg of C_4H_{10} (B) 1 mg of N_2 (C) 1 mg of Na (D) 1 ml of water
5. 2.76 g of silver carbonate on being strongly heated yields a residue weighing
(A) 2.16g (B) 2.48 g (C) 2.32 g (D) 2.64 g
6. Amount of oxygen required for combustion of 1 kg of a mixture of butane and isobutane is
(A) 1.8 kg (B) 2.7 kg (C) 4.5 kg (D) 3.58 kg
7. The volume of 7g of N_2 at N.T.P. is
(A) 11.2 L (B) 22.4 L (C) 5.6 L (D) 6.5 L
8. A piece of sodium weighs 0.023 g. The number of atoms present in it are
(A) 6.023×10^{20} (B) 60.23×10^{22} (C) 6.023×10^{21} (D) 6.023×10^{19}
9. What is the volume of 11 g of CO_2 at N.T.P. ?
(A) 5.6 ml (B) 5.6 litre (C) 56 litre (D) 0.56 litre
10. No. of molecules present in 8g of O_2 are
(A) 1.505×10^{23} (B) 2.505×10^{23} (C) 6.023×10^{23} (D) None
11. Complete the following table —

| S.No. | Substance | Molecular Mass | Mass of Sub s. | No. of Mo les | Total no. of molecules | No. of ato ms |
|-------|-----------|----------------|----------------|---------------|------------------------|---------------|
| 1 | PH_3 | | 17 g | | | |
| 2 | HCl | | | 3 mole | | |
| 3 | CH_4 | | | | 1.5×10^{23} | |
| 4 | H_2S | | 68 g | | | |
| 5 | HOCl | | | 0.5 mole | | |

12. Calculate the total number of electrons in 16 g of methane.
13. From 160 g of $SO_2(g)$ sample, 1.2046×10^{24} molecules of SO_2 are removed then find out the volume of left over $SO_2(g)$ at STP.
14. 14 g of nitrogen gas and 22 g of CO_2 gas are mixed together. Find the volume of gaseous mixture at STP.
15. Show that in the reaction $N_2(g) + 3H_2(g) \longrightarrow 2NH_3(g)$, mass is conserved.

STRUCTURE OF ATOM
DPP NO. 11
TOPIC : DALTON'S ATOMIC THEORY

1. Canal rays were named positive rays by -
(A) Dalton (B) Goldstein (C) Thomson (D) Chadwick
2. Dalton's atomic theory is based on -
(A) Law of conservation of mass (B) Law of definite proportion
(C) Both (A) and (B) (D) None of these
3. The name atom belongs to which language ?
(A) Latin (B) English (C) French (D) Greek

4. What happens when an electron jumps from a higher orbit to a lower orbit ?
(A) Energy is released (B) Energy is absorbed (C) A & B both (D) None of these
5. Cathode rays are deflected towards
(A) positive electrode (B) negative electrode (C) both electrodes (D) none of the electrodes
6. The nucleus of the atom consists of -
(A) Proton and neutron (B) Proton and electron
(C) Neutron and electron (D) Proton, neutron and electron
7. An electron is -
(A) alpha-ray particle (B) beta-rays particle (C) Hydrogen ion (D) Positron
8. Who discovered neutron ?
(A) James Chadwick (B) William Crooks (C) J.J. Thomson (D) Rutherford
9. Complete the following statements:
(i) The sum of number of protons and neutrons in the nucleus of an atom is known as ----- of the atom.
(ii) Isotopes have samenumber but different number.
(iii) Isobars have same number but different number.
(iv) contain same number of neutrons in their atoms.
(v) An atom of an element having 11 protons, 11 electrons and 12 neutrons, the atomic mass of the atom would be
10. The ratio of e/m for a cathode ray –
(A) varies with the gas in a discharge tube (B) is fixed
(C) varies with different electrodes (D) is maximum if hydrogen is taken
11. Write the isotopic symbols of the following nuclei
(i) Helium with one neutron.
(ii) Nitrogen with same number of protons and neutrons.
(iii) Argon with two more neutrons than protons.
(iv) An atom having 9 protons, 9 electrons and 10 neutrons.
12. Match the following
- | | |
|-----------------------|-------------------------------|
| Column I | Column-II |
| (i) Cathode rays | (a) Helium nuclei |
| (ii) Dumb-bell | (b) Uncertainty principle |
| (iii) Alpha particles | (c) Electromagnetic radiation |
| (iv) Moseley | (d) p-orbital |
| (v) Heisenberg | (e) Atomic number |
| (vi) X-rays | (f) Electrons |
13. What are isotopes? Give one example.
14. Four elements A, B, C and D are given
A shows the presence of 20 neutrons, 17 protons and 17 electrons.
B shows the presence of 18 neutrons, 17 protons and 17 electrons.
C shows the presence of 10 neutrons, 9 protons and 10 electrons.
D shows the presence of 4 neutrons, 3 protons and 2 electrons.
State which of the above is
(a) an anion (b) a cation (c) a pair of isotopes
Also write the formula of the compound formed between D and C.
15. Explain the reason for chemical reactivity of an atom with reference to its electronic configuration.

DPP NO. 12

TOPIC : ATOMIC MODELS AND ISO-TERMS

1. Electronic configuration of Si in ground state is -
(A) 2, 8, 2 (B) 2, 8, 4 (C) 2, 8, 3 (D) 2, 8, 5
2. Which of the following has maximum number of electrons ?
(A) N^{3-} (B) Ne
(C) O^{2-} (D) All have same no. of electrons
3. Electronic configurations of ions are like -
(A) configuration of non-metals (B) configuration of metals
(C) configuration of inert gases (D) None of these

4. Which of the following pairs are isobars ?
(A) ${}_{92}^{235}\text{U}$, ${}_{94}^{239}\text{Pu}$ (B) ${}_{36}^{83}\text{Kr}$, ${}_{36}^{84}\text{Kr}$ (C) ${}_{10}^{19}\text{Ne}$, ${}_{9}^{19}\text{F}$ (D) ${}_{58}^{139}\text{Ce}$, ${}_{58}^{140}\text{Ce}$
5. Which of the following metals represent variable valency ?
(A) Cr (B) Sn (C) Fe (D) All
6. 1 mole of a diatomic element X_2 contains 34 and 40 moles of electrons and neutrons respectively. The isotopic formula of the element is
(A) ${}_{34}^{74}\text{X}$ (B) ${}_{17}^{37}\text{X}$ (C) ${}_{34}^{40}\text{X}$ (D) ${}_{20}^{40}\text{X}$
7. Among the following groups which represents the collection of isoelectronic species ?
(A) NO^+ , C_2^{2-} , O_2^- , CO (B) N_2 , C_2^{2-} , CO, NO
(C) CO , NO^+ , CN^- , C_2^{2-} (D) NO, CN^- , N_2 , O_2^-
8. ${}^a_8\text{X}$ atom is isotonic to ${}^{17}_9\text{Y}$ atom. The value of 'a' is
(A) 8 (B) 16 (C) 9 (D) 17
9. The orbits in an atom are numbered by
(A) 100, 200, 300 (B) 10, 20, 30
(C) 1, 2, 3, 4 (D) 5, 10, 15
10. Mass number of three elements A, B and C are 35, 37 and 39 respectively. The number of neutrons in A, B and C are 18, 20 and 20 respectively. Which two elements will show similar chemical properties ?
(A) A and B (B) B and C (C) C and A (D) None of these
11. ${}^{10}_5\text{B}$ and ${}^{11}_5\text{B}$ are two isotopes of boron. If average mass number of boron is 10.2, what is the percentage of each isotope ?
12. (a) Name an element whose nucleus does not contain any neutron.
(b) Hydrogen has three isotopes written as : ${}^1_1\text{H}$, ${}^2_1\text{H}$, ${}^3_1\text{H}$
Explain why these isotopes have almost identical chemical properties.
13. The relative mass of an element A is 16.2. There are two isotopes ${}^{16}_8\text{A}$ and ${}^{18}_8\text{A}$ of the element. Calculate the percentage of these two isotopes present in the element.
14. What type of information is obtained about the atom by α -particle scattering experiment?
15. Explain the drawbacks of Rutherford's model and how Neil Bohr improved upon his experiment.