Delhi Public School, Jammu

Question Bank

Class: 9^{th} Subject: **Chemistry**

Topics: Matter in our surroundings

Is Matter Around us Pure?

Atoms and Molecules

Structure of the Atom

Q1. A drop of ink and a drop of honey are placed in water in different beakers. Which of the two will spread faster? Give reason for your answer.

Ans. Ink will spread faster as compared to honey. The density of honey is more than that of ink. Therefore, particles in ink diffuse faster as compared to the particles in honey.

Q2. A rubber band can change its shape on stretching; will you classify it as solid or not? Justify your answer.

Ans. Yes, it can be classified as a solid. It is an elastic solid which changes its shape on stretching and regains the same when the stretching force is removed.

Q3. a) Classify Brass and Diamond as element and mixture.

b) How is a chemical change different from a physical change?

Ans. a) Brass is a mixture of 30% Zn and 70% Cu whereas, Diamond is an element made up of carbon.

b) Physical change involves change of state only and no new substance is formed. Eg, melting point, boiling point, density, etc. Chemical change involves the formation of new substance having different chemical composition. e.g, $Fe + S \longrightarrow FeS$

Q4. A solution contains 60g of sugar in 480g of water. Calculate the concentration of solution in terms of mass by mass percentage of the solution.

Ans. Mass of sugar (solute) = 60g

Mass of solvent (water) = 480g

Mass of solution = (60+480) = 540g

$$\text{Concentration in terms of mass by mass percentage} = \frac{\text{Mass of solute}}{\text{Mass of solution}} \times 100$$

$$\frac{60g}{540g} \times 100 = 11.1\ \%$$

Q5. a) An element 'X' exhibits variable valencies 3 and 5. Write the formula of the chlorides of the element.

b) What is the ratio by mass of the elements present in the chemical formula of magnesium oxide.

Ans. a) the formula of the chlorides of the element 'X' = XCl_5 and XCl_3.

b) The chemical formula of magnesium oxide is MgO. The elements are present in the ratio of 24: 16 or 3:2.

Q6. a) Find the mass of 10 moles of sodium sulphite (Na_2SO_3).

b) Calculate the number of molecules in 8g of oxygen gas.

c) Convert 22g of CO_2 into moles.

Ans. a) Molar mass of $Na_2SO_3 = 2 \times 23 + 32 + 3 \times 16 = 46 + 32 + 48 = 126g$

Mass of 10 moles of $Na_2SO_3 = 126 \times 10 = 1260g$

b) Molar mass of Oxygen (O2) = 32g

32g of oxygen = 1 mol

8g of oxygen = (1mol) × 8g/32g = 0.25 mol

c) Molar mass of $CO_2 = 12+2\times16 = 44g$

44g of CO_2 = 1 mol

22g of CO_2 = (1mol) × 22g/44g = 0.5 mol

Q7. What are the postulates of Bohr's model of an atom?

Ans. The postulates of Bohr's model are:

i) Only certain special orbits known as discrete orbits of electrons, are allowed inside the atom.

ii) While revolving in discrete orbits, the electrons do not radiate energy. These orbits are called energy levels. Energy levels in an atom are shown by circles. These orbits are represented by the letters K,L,M,N,.....or the numbers, n=1,2,3,4.....

Q8. What were the drawbacks of Rutherford's model of an atom?

Ans:-The orbital revolution of the electrons is not expected to be stable. Any particle in a circular orbit would undergo acceleration and the charged particles would radiate energy. Thus, the revolving electron would lose energy and finally fall into the nucleus. If this were so, the atom should be highly unstable and hence matter would not exist.

PHYSICS

Q9. An object has moved through a distance. Can it have zero displacement? If yes, support your answer with an example.
Ans:-Yes, an object can have zero displacement even when it has moved through a distance. This happens when final position of the object coincides with its initial position. For example, if a person moves around park and stands on place from where he started then here displacement will be zero.

Q10. Which of the following is true for displacement?
(a) It cannot be zero.

(b) Its magnitude is greater than the distance travelled by the object.

Ans:-None of the statement is true for displacement First statement is false because displacement can be zero. Second statement is also false because displacement is less than or equal to the distance travelled by the object.

Q11. Which of the following has more inertia: (a) a rubber ball and a stone of the same size? (b) a bicycle and a train? (c) a five-rupees coin and a one-rupee coin?

Ans:-Inertia is the measure of the mass of the body. The greater is the mass of the body; the greater is its inertia and vice-versa.

(a) Mass of a stone is more than the mass of a rubber ball for the same size. Hence, inertia of the stone is greater than that of a rubber ball.
(b) Mass of a train is more than the mass of a bicycle. Hence, inertia of the train is greater than that of the bicycle.
(c) Mass of a five rupee coin is more than that of a one-rupee coin. Hence, inertia of the five rupee coin is greater than that of the one-rupee coin.

Q12. Why do you fall in the forward direction when a moving bus brakes to a stop and fall backwards when it accelerates from rest?

Ans:-In a moving bus, a passenger moves with the bus due to inertia of motion. As the driver applies brakes, the bus comes to rest. But, the passenger tries to maintain to inertia of motion. As a result, a forward force is exerted on him.
Similarly, the passenger tends to fall backwards when the bus accelerates from rest because when the bus accelerates, the inertia of rest of the passenger tends to oppose the forward motion of the bus. Hence, the passenger tends to fall backwards when the bus accelerates forward.

Q13. What do you mean by free fall?
Ans:-Gravity of earth attracts every object towards its center. When an object is dropped from a certain height, it begins to fall towards Earth's surface under the influence of gravitational force. Such a motion of object is called free fall.

Q14. What do you mean by acceleration due to gravity?

Ans:-When an object falls freely towards the surface of earth from a certain height, then its velocity changes. This change in velocity produces acceleration in the object which is known as acceleration due to gravity denoted by letter g . The value of acceleration due to gravity is g= 9.8 m/s2.

Q15. A pair of bullocks exerts a force of 140 N on a plough. The field being ploughed is 15 m long. How much work is done in ploughing the length of the field?

Ans:-Work done by the bullocks is given by the expression:

Work done = Force x Displacement
W= F x d
Where,
Applied force, F = 140 N
Displacement, d = 15 m
W= 140 x 15 = 2100 J
Hence, 2100 J of work is done in ploughing the length of the field.

Q16. What is power?

Ans:-Power is the rate of doing work or the rate of transfer of energy. If Wis the amount of work done in time t, then power is given by the expression, Power= Work / Time
= Energy / Time
P= W/T
It is expressed in watt (W).

Q17. Why are sound waves called mechanical waves?

Ans:-Sound waves needs material medium to propagate therefore, they are called mechnical waves. Sound waves propagate through a medium because of the interaction of the particles present in that medium.

Biology

Q18: What are macro nutrients and why they are called macronutrient?

Ans: The macronutrients are nitrogen phosphorus potassium calcium magnesium and sulphur. they are called macronutrients becoz they are required by crop plants in larger amounts.

Q19: Why are lysosomes called suicidal bags?

Ans: Lysosomes are called suicide bags as they contain hydrolytic enzymes which can digest in coming food materials remove the foreign bodies toxic molecules and debris break down won out cells and cell organelles to component molecules for building new organales and sense.

Q20: What does a neuron look like?

Ans: Neuron or nerve cell that is unit of nervous tissue which serves to transmit message in our body .each neuron has a long axon connected with the body cell which possesses many branched processes called dendrites.

Q21: Name the region in which parenchyma tissue is present.

Ans: Parenchyma tissue is present in cortex and pith of stem and roots.it is present in mesophyll of leaves.

Q22: Why is step farming common in hills?
Ans: Step farming is common in hills to check soil erosion through water currents on the slope.

Q23: Why are manure and fertilizer used in fields?
Ans: Manures and fertilizers are added in the sol to increase the fertility of soil and productivity of crops.they overcomes the deficiency of nutrients in the soil.

Q24: What is pasturage and how is it related to honey production?
Ans: Pasturage is the availability of flowers for nector and pollen collection.the quality and taste of the honey is determined by the kind and quantity of pasturage.

Q25: Name the scientists who proposed cell theory.
Ans: Cell theory was given schleiden and Schwann in 1838 and 1839.

Q26: What are the functions of areolar tissue?
Ans: Areolar tissue support internal organs and helps in repair of the tissues.