CHEMISTRY 9th (New Book)

CHAPTER NO 1 STATES OF MATTER AND PHASE CHANGES

EXERCISE MCQS AND SHORT QUESTIONS

1.	Plasma	2.	Environmental Chemistry
3.	Polystyrene	4.	Sulphur
5.	Milk	6.	Concrete Mixture
7.	Liquid Crystal	8.	Colloid
9.	The solubility will decrease	10.	Physical Chemistry

Q#2: Short Question Answer

i. Why is there a need to divide Chemistry into many branches? Give three reasons.

Need of Division in Chemistry:

a) Chemistry is a vast subject, so division makes it easy to study and understand.

b) Each branch (like Organic and Inorganic) focuses on a specific area.

c) It helps in practical uses like medicine, agriculture, and industry.

ii. Reactions may take place due to electrons present outside the nucleus or they may take place inside the nucleus. Which branches of Chemistry cover these two types of reactions?

a) Reactions involving electrons outside the nucleus are covered by Physical chemistry.

b) Reactions taking place inside the nucleus studied in the Nuclear chemistry.

iii. What types of problems are solved in analytical chemistry?

Analytical chemistry focuses on the:

a) Qualitative Analysis: It involves the identification of the components in a sample.

b) Quantitative Analysis: It involves determination of amount of each component in a sample.

c) Separation Technique: It involves isolation of specific components from a mixture.

iv. Both graphite and graphene have hexagonal layered structures. What is the difference?

Graphite	Graphene
Structure	
It is multilayered structure having interlayer spacing.	It is single layer of carbon atoms arranged in a hexagonal pattern having no interlayer spacing.
Bonding Forces	

Graphite	Graphene
There are weak Vander Waals forces present between their layers.	It has strong covalent bonds within the single layer.
Properties	
It is soft slippery, have good electrical conductivity.	It is tough, flexible having exceptional electrical conductivity.
Applications	
It is used in catalyst, lubricants, pencils etc.	It is used in electronics, biomedicine, transistors, logic circuits etc.

v. Why are supercritical fluids important?

Importance of supercritical fluids:

Supercritical fluids are important because they are highly compressed states that show both properties of gases and liquids. Chemical reactions which may not be carried out in conventional solvents, may possibly be carried out in supercritical carbon dioxide.

These fluids are used in various processes such as extraction, chromatography and chemical reactions due to their unique properties like high diffusion low viscosity and high solvating power.

vi. In which state does matter exist if the Sun?

Plasma:

Whole of the matter in Sun exists in plasma state. It contains Hydrogen, Helium, other trace elements and ionized species (electrons, ions, protons).

vii. What is the importance of graphene?

Importance of Graphene:

Graphene is an example of two-dimensional crystal, a single layer of carbon atoms arranged in a hexagonal pattern. Graphene is a highly significant material due to flexible and light material with high resistance used in water treatment sensors biomedical electronics logic circuits etc.

viii. Which form of matter do most of the material things in this world belong to?

Solid State:

Most of the material things in this world belong to solid form of matter due to definite shape and structure.

Q#2: Constructed Response Questions

i. How does a supercritical state look like?

Supercritical Fluids:

Supercritical fluids are highly compressed states with show both properties of gases and liquids. Supercritical fluids are often clear and can flow easily.

ii. In what way is plasma created in a fluorescent tube?

Fluorescent Tube:

In a fluorescent tube plasma is created when an electric current is passed through the gas inside the tube. It excites the gas and ionizes the atoms. Thus, a glowing plasma is produced.

iii. Most of the molecules we study in biochemistry are organic in nature. Where does the difference exist in organic and biochemistry branches of chemistry?

Organic Chemistry	Biochemistry
Definition	
Organic Chemistry deals with carbon compounds (hydrocarbons and their derivatives), excluding simple salts like carbonates, bicarbonates, oxides, and carbides.	Biochemistry deals with the chemical substances and vital processes occurring in living organisms.
Applications	
It studies the structure, formation, properties, composition, and reactions of carbon-containing compounds.	It studies the structure and function of molecules of life such as proteins, carbohydrates, lipids, and nucleic acid.

iv. Give the reason of brilliance shown by diamond. Can you improve it?

Reason:

The reason is that it has a high refractive index, bending light to create sparkle and light reflects multiple times inside it, increasing its shine. Prepare cutting enhances light reflection and enhances their sparkle. It disperses light into colors, adding a rainbow effect.

Improvement:

Yes, the Brilliance of a diamond can be improved by proper cutting polishing to enhance light reflection, removing impurities to improve clarity, regular cleaning to remove dirt and oils.

v. Explain the dissolution of NaCl in water.

Dissolution of NaCl:

When NaCl is added in water it dissolves readily because the attractive interaction between the ions of NaCl and polar molecules of water are strong enough to overcome the attractive forces between Na^+ and Cl^- ions in solid NaCl crystal. In this way NaCl is dissolved in water.

vi. Why do different compounds have different solubilities in water at a particular temperature?

Reason:

Different compounds have different solubilities in water at a particular temperature because of the difference in the strength of intermolecular forces between the molecules of compound and water molecules.

vii. Why NaCl cannot be crystallized from water just like KNO_3?

Reason:

NaCl (sodium chloride) cannot be crystallized from water in the same way as KNO_3 (potassium nitrate) because NaCl has a higher solubility in water and a lower tendency to form crystals.

viii. Why graphite is slippery to touch? Which property of graphite enables it to be used as lubricant?

Reason:

Graphite feels slippery to touch because it is made up of layers of carbon atoms that are loosely held together. These layers can easily slide over each other due to the weak forces between them, giving graphite it's smooth and slippery feel.

The unique property that enables it to be used as lubricant is its low coefficient of friction which is due to the weak interlayer forces between the carbon layers. This allows graphite to reduce friction between moving surfaces making it an effective lubricant.