

## PREVIOUS QUESTIONS AND ANSWERS

### CHEMISTRY (313)

#### Question 1 to 5 carry one mark

1. Which of the following metal is present in chlorophyll.  
A. Be. B. Ca. C. Mg D. Sr. (NIOS 2007)  
Answer Mg
2. Wood spirit is known as (NIOS. 2008)  
Answer Methanol
3. Oxidation state of nitrogen in  $\text{NO}_3^-$  (. Model 2023)  
Answer +5
4. The molarity of the solution containing 32 gram of methanol in 250 ml solution is (NIOS. 2008)  
Answer 4
5. All noble gas molecules are (NIOS model 2023)  
Answer . monoatomic

#### Question 6 to 10 carry 2 marks

6. Explain the terms (model 2023)  
A. Buffer capacity  
B. Buffer index

Answer

Buffer capacity is the ability of the buffer to resist the pH by the addition of small amount of an acid or a base the quantitative measure of buffer capacity is the buffer index

7. What are surfactants and give example (Oct 2022)

Answer

Surfactants are chemical substances that reduce surface tension between substances, such as liquids, solids, or gases.

Eg. Soaps and detergents

8. Give two important uses of ( Oct 2022)  
A. Bakelite  
B. Nylon 6,6

Answer. A. Bakelite has many uses, including:

Electrical insulators: Bakelite's non-conductive and heat-resistant properties make it useful in electrical insulators, radios, and telephones.

B. Nylon 6,6 is a versatile synthetic polymer with many uses, including:

Textiles

Nylon 6,6 is used in clothing, carpets, and sportswear. It's also used in luggage under the Cordura brand.

Electrical and electronics

Nylon 6,6 is used in electro-insulating elements, circuit insulation boards, switchgear, and more.

9. Name the two allotropes of carbon which one is conductor and which one is not. Which one is used to make pencil.

(Model 2023)

Answer: graphite and diamond are to allotropes of carbon.

Graphite is conduct electricity and and diamond does not conduct electricity. Diamond is a good conductor of heat. Graphite is used in pencil

10. What do you mean by co-ordinate covalent bond and give example ( apr 2024)

Answer: A coordinate covalent bond, also known as a dative covalent bond, is a type of covalent bond where one atom donates both electrons to the bond. In a coordinate covalent bond, the atom that donates the electrons is called the donor, and the atom that accepts them is called the acceptor. In diagrams, a coordinate bond is shown as an arrow pointing from the donor atom to the acceptor atom.

Eg.  $\text{NH}_3$  and  $\text{BF}_3$

$\text{NH}_3 \rightarrow \text{BF}_3$

Question 11 to 13 carry 3 marks

11. Define the following terms (model 2023)

- A. More fraction
- B. Isotonic solutions
- C. Van't Hoff factor

Answer:

Mole fraction is the ratio of number of moles of 1 component to the total number of moles in a mixture

Isotonic solution is solutions having same osmotic pressure at a given temperature are called isotonic solution

The abnormalities in the measurement of colligative properties are improved by a factor known as Van't Hoff factor it is expressive by  $i$

$i$  is the ratio of normal molecular mass to the abnormal molecular mass

12. Explain the postulates of VSEPR theory. Structure of methane molecule ( Oct 2022)

Answer. The postulates of the Valence Shell Electron Pair Repulsion (VSEPR) theory are:

Central atom: In a polyatomic molecule, one atom is designated as the central atom, and all other atoms are linked to it.

Electron pairs: The shape of the molecule is determined by the number of electron pairs in the valence shell.

Electron pair repulsion: Electron pairs repel each other because their electron clouds are negatively charged.

Electron pair position: Electron pairs position themselves to minimize repulsion and maximize distance between them.

Valence shell: The valence shell is a sphere, and electron pairs are arranged on its surface as far apart as possible.

Bond pairs and lone pairs: An asymmetric molecule is formed when the central atom is surrounded by bond pairs of electrons. A distorted molecule is formed when the central atom is surrounded by both lone pairs and bond pairs of electrons.

Shape of CH<sub>4</sub>

According to the VSEPR theory, the structure of methane (CH<sub>4</sub>) is tetrahedral, with the carbon atom at the center and four hydrogen atoms arranged at the corners of a tetrahedron. The bond angles between the hydrogen atoms are 109.5°.

