Makawanpur Multiple Campus

Second Terminal examination -2080

Grade: XI | Subject: Chemistry

Time: 3 hours | Full marks: 75

Attempt all the questions.

Group A

Choose the right option to the following questions. [11X1=11]

1. What is the total number of carbon atoms in a cyclopropane molecule?

a) 6 b) 5 c) 4 d) 3

2. What is the functional group for an aldehyde?

a) -CHO b) -COOH c) -OH d) -O-

3. Which of the following is absolute zero temperature?

a) 273K b) 0°C c) 0K d) 25°C

4. What is the cetane number for cetane?

a) 100 b) 50 c) 0 d) 80

5. Which of the following metals is required for the synthesis of vitamin B_{12}?

a) Na b) Ca c) Co d) Fe

6. Which of the following is a metalloid?

a) steel b) bronze c) German silver d) germanium

7. Calculate the oxidation number of Sulphur in $Na_2S_2O_3$.

a) +2 b) +1 c) -2 d) -1

8. How many types of basic or primitive unit cells are there in a crysta system?

a) 9 b) 7 c) 6 d) 2

9. The zero group in the modern periodic table is also called group ....

a) 18 b) 17 c) 16 d) 15

10. Neutron was discovered by .....

a) Zeeman b) Rutherford c) Chadwick d) Davisson

11. A mole of carbon dioxide gas at NTP is equivalent to .....

a) 44 g b) 6.023×10^{23} molecules c) 22.4 L volume d) 22 g

Group B

Give short answer to the following questions. [8X5=40]

12. Quantum numbers are used to describe about an electron. They are four in numbers. [2+2+1]

a) Verify Pauli's exclusion principle with an example.

b) State Hund's rule of maximum multiplicity with proper example.

c) Calculate the de-Broglie's wavelength for a stone of mass 10 g moving with a velocity of 2×10^2 m/sec. [h= 6.62×10^{-34} Js]

OR

Metals are obtained by the extraction process from their ores.

a) Define slag and gangue with examples. [2]

b) Differentiate between mineral and ore. [1]

c) Describe the froth floatation process. [2]

13. Discuss the principle behind the manufacture of ammonia by Haber's process along with its flowsheet diagram. [5]

14. 2.4 g of pure magnesium is treated with 0.2 mole of sulphuric acid to yield $MgSO_4$ and H_2. [2+1+1+1]

a) Find the limiting reactant with reason.

b) Calculate the mass of excess reactant.

c) How many moles of $MgSO_4$ are produced?

d) What mass of water will be produced if the whole H_2 gas formed in the reaction reacts with O_2?

15. Organic compound also contains other elements like S, N and halogens in their molecules. These elements are called foreign elements.

a) What do you mean by Lassaigne's solution? How is it prepared? [2]

b) Describe the process of detection of nitrogen in the given organic sample. [3]

OR

Describe the atomic spectra in hydrogen atom. What are the limitations of Rutherford's atomic model? [3+2]

16. There is no ideal gas in the world. All known gases are called real gases.

a) State Boyle's law and Charles law. [2]

b) There is a spherical air bubble having radius 0.50 cm at the bottom of a lake where the temperature is 7°C and the pressure is 2.8 atm. It rises to the surface where the temperature is 27°C and the pressure is 1 atm. Calculate the radius of the air bubble when it reaches the surface. [3]

17. The law of conservation of mass is well illustrated by the balanced chemical equation.

a) $I^- + MnO_4^- \longrightarrow I_2 + MnO_2$ (in basic medium) Balance by ion-electron method.

b) Differentiate between valency and oxidation number.

18. The chemical bond is responsible for the stability of a molecule. These are of various types on the basis of their natures.

a) What are the basic assumptions of electronic theory of valency? [2]

b) Write the general properties of co-ordinate covalent compounds. [2]

c) What do you mean by metallic bond? [1]

19. The universe is made up of matter and energy. The matter is of three types in general. They are solid, liquid and gas.

a) Define surface tension. Describe the capillary action. [2]

b) Define the following terms along with examples. [3]
Efflorescence, Hygroscopy and deliquescence.

$$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$$

Group C

Give long answer to the following questions. **[3X8=24]**

20. Define ionization energy and electron affinity. Describe the factors affecting the ionization energy. What is meant by periodicity. State faraday's first and second laws of electrolysis. [2+3+1+2]

21. What are the postulates of Bohr atomic model? Establish the relation between Kp & Kc. What are the characteristics of equilibrium constant. State Le-Chatelier's principle. [3+2+2+1]

OR

Differentiate between Nascent and Atomic hydrogen. Classify the following oxides ($HClO_4$, Al_2O_3, MgO, Pb_3O_4) according to their natures. State Avogadro's hypothesis and law of constant composition. Show that the molecular weight of a gas is twice its vapor density. [2+2+2+2]

22. Define cracking and functional group. Write any three characters of homologous series. Describe chain isomerism and position isomerism with examples. Write down the structures of following organic compounds.
Neopentane, vinyl chloride, acetone, acetic acid. [2+2+2+2]

All the best