

GROUP A

MULTIPLE CHOICE QUESTIONS:

Circle the best alternative to the following questions. [11 ×1=11]

1. Heterolytic fission of carbon-to-carbon bond gives:

- a. Free radicals
- b. Charged species
- c. Neutral species
- d. None of these

2. But-1-ene and But-2-ene are

- a. Chain isomers
- b. Functional isomers
- c. Position isomers
- d. Metamers

3. Aromatic compounds mostly show

- a. Addition reaction
- b. Substitution reaction
- c. Elimination reaction
- d. Oxidation reaction

4. 100 octane number is assigned for

- a. 2,2,4-trimethyl pentane
- b. Benzene
- c. n-heptane
- d. n-octane

5. Which of the following metal is present in haemoglobin?

- a. Fe
- b. Mg
- c. Co
- d. Zn

6. The mass of ionic species decomposed by 1C of electricity is

- a. E.C.E
- b. C.E
- c. Atomic mass
- d. molecular mass

7. Shape of orbital is given byquantum number

- a. Principal
- b. Azimuthal
- c. Magnetic
- d. Spin

8. Elements with atomic number 19 belongs to which block of periodic table?



- Name a chemical that is oxidized and reduced. Also mention the oxidation state of oxidized state and reduced state.
- Balance the given reaction by ion-electron method.

15. The principle and technology used to obtain metal in pure state from ore is called metallurgy. Three types of metallurgical operations are in use.

i) Hydrometallurgy ii) Electrometallurgy iii) Pyrometallurgy

- a. Define hydrometallurgy. [1]
- b. Write a metal ore from which a pure metal is extracted by hydrometallurgy. [1]
- c. What is pyrometallurgy? Give two examples of metal whose extraction uses pyrometallurgy. [2]
- d. Define the term gangue or matrix. [1]

16. Due to the more efficiency and no health hazard of mercury, caustic soda (NaOH) is manufactured by diaphragm cell in preference to mercury cathode cells by Nelson.

- a. Write the reaction at cathode when electrolysis of brine solution is carried out. [1]
- b. What are the possible side products in the process? [1]
- c. How does diaphragm used in cell minimize side products in the manufacture of NaOH by electrolysis of brine? [1]
- d. Draw the sketch of revised Nelson's cell. [2]

17. H₂S is weak dibasic acid.

- a. Convert H₂S into Na₂S. [1]
- b. Is H₂S a strong reducing agent? Can it act as oxidant? Justify with the help of oxidation number. [2]
- c. Write the action of H₂S with acidified K₂Cr₂O₇ providing balanced chemical reaction. [1]
- d. What is the usual product when H₂S acts as reducing agents. [1]

OR

Active transport is necessary to maintain ions concentration in extracellular fluid and intracellular fluid with the help of cellular ion pump.

- a. Define active transport.
- b. On what basis active transport is divided into primary and secondary? [1]
- c. Write an example of active transport. [1]
- d. What is the source of energy for the sodium-potassium pump to maintain Na⁺ and K⁺ ions in and out of the cell membrane? [1]

e. How many Na^+ ions are transported out of cell and K^+ in to the cell per computation of ATP molecule in Na-K pump? [1]

18. Chemical equilibrium is the state of a system at which all the properties of a system do not change with time. There are three factors temperature, pressure and concentration which affect the state of equilibrium.

- Define Equilibrium constant. [1]
- Write the relationship between the K_p and K_c for the following reaction.[1]



- Why is backward reaction favored when $K_c < 1$? [1]
- Mention the proper condition for maximum yield of product in the following reaction.[2]



19. Periodic table is the arrangement of chemical elements based on increasing order of atomic number.

- Define ionization energy.[1]
- Arrange the elements Na, Li and K in the increasing order of first ionization energy. [2]
- Which ion would you expect to have larger size and why? Mg^{++} or Na^+ . [2]

GROUP C

LONG QUESTIONS ANSWER:

[3 X 8 =24]

20. Kolbe's electrolytic method can be used to prepare alkane, alkene and alkyne.

- At which electrode alkane, alkene and alkyne is obtained? (1)
- Which electrolyte must be chosen for alkane, alkene and alkyne for the method? Suggest an example of electrolyte for each. (2)
- If potassium salt of dicarboxylic acid is taken for the method, which hydrocarbon is prepared? (1)
- Write the detail process for the electrolysis of aqueous potassium maleate. (2)
- Suggest a demerit of this method. (1)
- Among the alkane, alkene and alkyne which hydrocarbon is most acidic? [1]

OR

The combination of two atoms by redistribution of electrons is called chemical bonds. There are three types of chemical bonds; Ionic bond, covalent bond and coordinate covalent bond.

- How does covalent bond differ from ionic bond.[2]
- Write the resonating structure of ozone.[1]

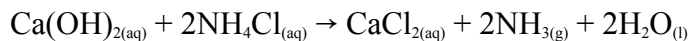
- How would you predict the geometry of ammonia molecules on the basis of VSEPR theory?[2]
- Why bond angle of H₂O is higher than bond angle of H₂S.[2]
- What is the mode of hybridization of B in BF₃. [1]

21. Sir J.J Thomson, Lord Rutherford and others in the beginning of 20th century have shown that an atom has a complex structure consisting of no. of sub particles.

- Write the electronic configuration of Ca⁺⁺. [1]
- Name the principle which goes against Bohr's fixed orbits. [1]
- Assign the values of the quantum numbers n, l and m for the outermost electron in potassium atom. [2]
- Draw and name the various spectral series observed in the spectrum of hydrogen atom. [4]

22. The amount of substance containing Avogadro's no. of atoms or molecules is known as mole and the substance which gets completely consumed in the chemical reaction is known as limiting reagent and which do not is considered excess.

- Calculate the no. of Hydrogen atom in 3.4 g of H₂O. [2]
- Which one has higher mass? 0.5 mole of CO₂ or 16 g of SO₂. [1]
- For a reaction,



The reaction is carried out by mixing 7 g of pure Ca(OH)₂ and 7 g of pure NH₄Cl.

- Find the limiting reactant. [1]
- Calculate the mole of unreacted reactant left over. [1]
- How many grams of CaCl₂ is formed? [1]
- What volume of NH₃ gas is produced at 27°C and 1.5 atmospheric pressure. [2]

----BEST OF LUCK----