XI CHEMISTRY FULL LENGTH TEST

Time : 3 Hrs. **M.M. : 70**

(i) All questions are compulsory.
(ii) Q. No. 1 to 5 are Very Short Answer Question carrying 1 mark each.
(iii) Q. No. 6 to 12 are Short Answer Questions and carrying 2 marks each.
(iv) Q. No. 13 to 24 are Short Answer Questions and carrying 3 marks each.
(v) Q. No. 25 to 27 are Long Answer Questions and carrying 5 marks each.
(vi) Use log tables, if necessary, Use of calculator is not allowed.

1. Define critical temperature.

2. What is the oxidation number of Mn in $KMnO_4$?

3. Write the electronic configuration of Cr^{3+}?

4. Write the IUPAC name of an element having atomic number 105?

5. State Boyle's law?

6. (a) What is redox reaction?

(b) Identify the substance reduced in the following reaction.

$$Fe_2O_3(s) + 3CO(g) \longrightarrow 2Fe(s) + 3CO_2(g)$$

7. Explain why?

(a) Cs is used in photoelectric cell.

(b) Potassium carbonate cannot be prepared by solvey process.

8. (a) State Pauli's exclusion principle.

(b) What is the lowest value of 'n' that allows 'g' orbital to exist.

9. (a) Find the [H+] ion concentration in 100 mL of 0.001 M NaOH solution.

(b) Write the nature of following solution.

(i) $[OH^-] = 10^{-5}$ (ii) $[OH^-] = 10^{-10}$

10. Write the name and number of the each type of the bonds in the following compound.

11. Write balanced equations for the equation between.

(a) Na_2O_2 and water

(b) Na_2O and CO_2

12. (a) What type of isomerism is shown by pentane and 2-methylbutane?

(b) Write the name of isomerism among the following compound.

$$CH_3–CH_2–CHO \text{ and } CH_3–\underset{\underset{O}{\|}}{C}–CH_3$$

13. Write the name reactions:

(i) Wurtz reaction

(ii) Decarboxylation

(iii) Kolbe's Electrolysis

14. Compare the relative stabilities of O_2^- and N_2^+ and comment on their magnetic behaviour.

15. (a) Find oxidation number of

(i) Mn in MnO_4^- (ii) O in H_2O_2

(b Balance the following equation by ion electron method in basic medium

$$MnO_4^- + I^- \longrightarrow MnO_2 + IO_3^-$$

16. Give the reasons for the following:

(a) Electron gain enthalpy of fluorine is less negative that of chlorine.

(b) Anionic radius is always more than that of oxygen.

(c) Ionization ethlapy of nitrogen is more than that of oxygen.

17. A neon-dioxygen mixture contains 70.6g dioxygen and 167.5g neon. If pressure of the mixture of gases in the cylinder is 25 bar. What is the partial pressure of dioxygen and neon in the mixture.

18. (i) XeF_4 has AB_4E_2 type molecule draw the arrangement of electron pair.

(ii) Discus the shape (geomatry) of NH_3 or H_2O on the basis of hydridization.

19. (a) Explain electrophile and nucleaphile with one example each.

(b) Write the possible Tautomer of the acetone (CH_3 CO CH_3).

(c) Explain the Inductive effect.

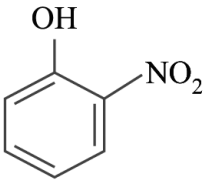
20. (a) How is diborane prepared in the laboratory? Draw its structure.

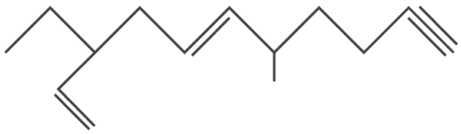
(b) Explain why CO is a gas whereas SiO_2 is a solid.

(c) Write the shape of PCl_5.

21. Write the IUPAC names of the following :

(a) 

(b) 

(c) 

22. (a) Identify the reagent shown underlined as electrophile or nucleophile :

$$CH_3COOH + \underline{OH^-} \longrightarrow CH_3COO^- + H_2O$$

(b) On complete combustion of 0.246 g of an organic compound gave 0.198g of CO_2 and 0.1014 g of H_2O. Determine the percentage composition of carbon and hydrogen in the compound.

23. (a) Calculate the total pressure in a mixture of 8 g of dioxygen and 4 g of dihydrogen confined in a vessel of 1 dm^3 at 27°C.

[Given R = 0.083 bar dm^3 K^{-1} mol^{-1}]

(b) Critical tempreature of CO_2 and CH_4 are 31.1°C and 81.9°C respectively. Which of these has strongen intermolecular forces and why?

24. How can you apply green chemistry for the following:

(i) to control photochemical smog.

(ii) to reduce used of synthetic detergents.

(iii) to reduce the consumption of petrol and diesel.

25. (a) Explain the following with example

(i) Common ion effect

(ii) Buffer solution

(b) At a certain tempreature and total pressure of 10^5 pa, iodine vapour contains 40% by volume of I atoms

$$I_2(g) \rightleftharpoons 2I(g)$$

Calculate K_p for the equilibrium.

OR

(a) Define Le-Chateler's principle.

(b) Define pH.

(c) Equilibrium constant for the reaction is 4.0. What will be the equilibrium constant for the reverse reaction.

(d) Calculate the pH of 10^{-3}M NaOH solution.

26. (a) Define Heisenberg's uncertainity principle. Write its Mathematical exopression.

(b) Calculate the uncertainity in the velocity of a cricket ball of mass 150 g. If the uncertainity in its position is of the order of 1° A.

($h = 6.6 \times 10^{-34}$ kg $m^2 s^{-1}$)

OR

(a) Which of the following orbitals are not possible ? 1p, 2s, 2p, 3s

(b) Which of the following sets of quantum number are not possible? Give reason:

(i) $n = 0, l = 0, m_l = 0\ m_s = +½$

(ii) $n = 1, l = 0, m_l = 0\ m_s = -½$

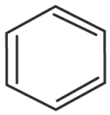
(c) Electron are emitted with zero velocity from a metal surface when it is expressed to radiation of wavelength 6800 Å. Calculate threshold frequency (υ_0) and work function (W_0) of the metal.

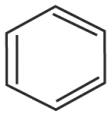
27. (a) Define the following with example:

(i) Antimarkovnikev's addition

(ii) Morkovnikoff's Rule

(b) Give the main product of the reaction:

(i)  $+ CH_3—Cl \xrightarrow{\text{Anhyd } AlCl_3}$

(ii)  $+ HNO_3 \xrightarrow[\Delta]{\text{conc } H_2SO_4}$

(ii) $CH_3—\underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}} = CH_2 + H_2O \xrightarrow{\Delta}$

OR

(a) How can you convert the following :

(i) Propane-1-ol to propan-2-o1

(ii) Ethyl chloride to n-Butane.

(b) Complete the following reaction:

(i) $CH_3—CH = CH_2 + HBr \xrightarrow{\text{Organic peroxide}}$

(ii) $CH_3—Cl + Na \xrightarrow[\text{ether}]{\text{Dry}}$

(iii) $CH_3—\underset{\displaystyle Cl}{\overset{\displaystyle |}{CH}} = CH_2—CH_3 \xrightarrow[\Delta]{\text{alc KOH}}$