Practice Paper-III
## Subject : Chemistry (Theory)
Class : XI

Time : 3 Hrs.   **M.M. : 70**
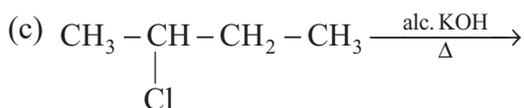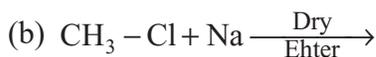
(i) All questions are compulsory.
(ii) Q. No. 1 to 5 are Very Short Answer Question carrying 1 mark each.
(iii)Q. No. 6 to 12 are Short Answer Questions and carrying 2 marks each.
(iv)Q. No. 13 to 24 are Short Answer Questions and carrying 3 marks each.
(v) Q. No. 25 to 27 are Long Answer Questions and carrying 5 marks each.
(vi)Use log tables, if necessary, Use of calculator is not allowed.

1. Define electron gain enthalpy.
2. In which orbital will the electrons enter first 3d or 4p?
3. Write I.U.P.A.C. name of the following compound:

$$CH_3 - CH_2 - CH - CH_2 - CH_2 - Cl$$
$$|$$
$$OH$$
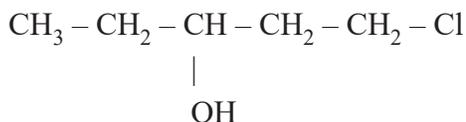
4. Define standad enthalpy of formation.
5. Write electronic configuration of Cu^{2+} ion. (Atomic number of Cu = 29).
6. How does Heisenberg's uncertainty principle support concept of orbital?
7. Give the units of vander waal's constants. Also point out their significance.
8. 0.3780 g of an organic chloro compound gave 0.5740 g of silver chloride in carius estimation. Calculate the percentage of chlorine present in compound.
9. Write the short notes on:
    (a) Wurtz Reaction   (b) Freidal Craft's Alkylation
10. Write the molecular shapes of :
    (a) XeF_4 (b) CIF_3
11. Determine the emperical formula of an oxide of iron which has 69.9% iron and 30.1% dioxygen by man.   [Atomic mass: Fe = 55.85, O = 16.00]
12. The ionization enthalpy of lithium is 520 $kJmol^{-1}$, calculate the amount of energy required to convert 140 mg of lithium atoms in gaseous state into Li^+ ion.
13. Compelete the following reactions:
    (a) $CH_3 - CH = CH_2 + HBr \xrightarrow{\text{peroxide}}$

(b) $CH_3 - Cl + Na \xrightarrow[\text{Ehter}]{\text{Dry}}$

(c) $CH_3 - CH - CH_2 - CH_3 \xrightarrow[\Delta]{\text{alc. KOH}}$
$\qquad\quad |$
$\qquad\quad Cl$

14. Balance the following reaction in acidic medium:

$MnO_4^-(aq) + SO_2(g) \longrightarrow Mn^{2+}(aq) + HSO_4^-(aq)$
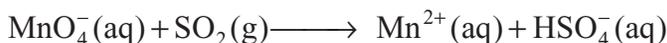
15. The value of K_C for the reaction:

$2A \rightleftharpoons B + C$ is 2×10^{-3} at 500K. At given time, the composition of reaction mixture is $[A] = [B] = [C] = 3 \times 10^{-4}$ M. Is the reaction mixture at equilibrium? If not, what is the direction of net reaction?

16. (i) Write down the nature of below reaction with reason:

(a) $NH_3 + H^+ \rightarrow NH_4^+$

(b) $BF_3 + NH_3 \rightarrow F_3B \leftarrow NH_3$

(c) $H_2SO_4 \rightarrow H^+ + HSO_4^-$
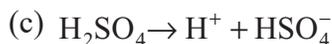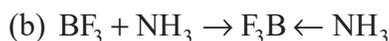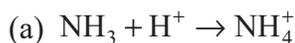
17. (i) Arrange the following carbocation in creasing order of their stability.

$(CH_3)_2 CH^+, CH_3CH_2^+, (CH_3)_3 C^+, CH_3^+$

18. How will you convert

(a) Propan-1-ol into propene

(b) 2-bromopropane into But-2-ene

(c) Ethyl amine into ethyl isocyanide

19. (i) Define eutrophication and penumocanosis.

(ii) Write difference in between photochemical and classical smog.

20. (i) Calculate the oxidation number of S in $S_2O_6^{-2}$ having $(- O - O -)^{2-}$ linkage and C in CH_3COOH.

(ii) Balance the equation in basic medium by half reaction method

$P_4(s) \rightarrow PH_3(g) + H_2PO_2^-(Aq)$
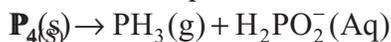
21. (a) Out of staggerd and eclipsed conformations of n-butane, which is more stable and why?

(b) What causes the temporary and permanent hardness of water.

22. Write a breif note on the following environmental terms:

(a) Acid rains

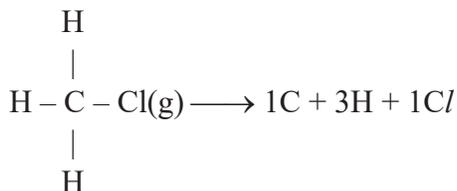(b) Eutrophication/Green House effect

(c) Green chemistry

23. (a) Define buffer solution.

(b) The solubility of $Sr(OH)_2$ at 298 K is 19.23g/L of solution. Calculate the concentration of strontium and hydroxyl ions and the pH of the solution.

24. Write any three main biological importance of Ca and Mg.

25. (i) The stability of peroxide and superoxide of alkali metals increases as we go down the group. Explain giving reasons.

(ii) How to control photochemical smog.

<div align="center">OR</div>

(i) Derive first law of thermodynamics.

(ii) Define enthalpy of neutralisation.

(iii) Calculate the ΔH^θ of the reaction.

$$
\begin{array}{c}
\text{H} \\
| \\
\text{H} - \text{C} - \text{Cl(g)} \longrightarrow 1\text{C} + 3\text{H} + 1\text{C}l \\
| \\
\text{H}
\end{array}
$$

Bone enthalpies of C–H & C–Cl bond are 415 kJ mol^{-1} & 326 kJ mol^{-1}

26. (a) Account for the following:

(i) Boron Halides do not dimerise like BH_3.

(ii) Carbon shows catenation

(iii) $PbCl_4$ is a good oxidising agent.

(b) Complete the following reactions:

(i) $B_2H_6 + 3O_2 \longrightarrow$

(ii) $2BF_3 + 6\ NaH \xrightarrow{\ 450\ K\ }$

<div align="center">OR</div>

(a) Write equation to justify amphoteric nature of Water.

(b) What is application of equilibrium constant.

(c) What are the full form of BOD?

27. (a) Is the entropy of the universe constant?

(b) If standard free energy change for a reaction is found to be zero, what is its equilibrium constant.

(c) Define common ion effect.

<div align="center">OR</div>

(a) Calculate the degree of ionisation of 0.1 mol/L solution of acetic acid, given K_a for CH_3COOH 1.8×10^{-5} mol/L

(b) Define the following terms :

(i) Solubility product

(ii) Buffer solution

(iii) Henderson equation