Final Paper (27 February 2017)
Class XI
Paper- CHEMISTRY
(Set-A)

Time: 3hrs.   M.M. 70

i)   **All questions are compulsory.**

ii)   **Q 1 – 5 carry 1 mark each.**

iii)   **Q 6 – 10 carry 2 mark each.**

iv)   **Q11 – 22 carry 3 marks each.**

v)   **Q 23 carry 4 mark.**

vi)   **Q24 – 26 carry 5 marks each.**

Q1.   State Mendeleev's periodic law.

Q2.   Find the number of $\sigma \ and \ \pi$ bonds in given compound.

Q3.   Define critical temperature.

Q4.   Find the oxidation number of Cr in $K_2 \, Cr_2 \, O_7$

Q5.   Find the conjugate base of HCO_3^- .

Q6.   How does $H_2 \, O_2$ behave as a bleaching agent?

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

Explain water-gas shift reaction.

Q7.   Why Alkali metal solution in liquid NH_3 is coloured and conducting in nature?

Q8.   What do you understand by (i) Catenation   (ii) Inert pair effect

Q9.   What is carbanion? Discuss their order of stability.

Q10.   Explain the following:

      i)   Friedal Crafts Alkylation

      ii)   Antimarkonikoves rule

Q11.   Write the general electronic configuration of S, p and d-block elements.

Q12.   Calculate the volume occupied by 8.8 g of CO_2 at 31.1 ^{0}C and 1 bar pressure. R = 0.083 bar LK^{-1} mol^{-1}.

Q13.   Describe the effect of:

      i)   Addition of H_2

      ii)   Addition of CH_3OH

      iii)   Removal of CO

      On the equilibrium of the reaction $2H_2 \, (g) + CO \, (g) \rightleftharpoons CH_3 \, OH \, (g)$

Q14.   Balance the given redox reaction in acidic medium $Cr_2 \, O_7^{2-} \, (aq) + SO_3^{2-} \, (aq) \rightarrow Cr^3 + (aq) + SO_4^{2-} \, (aq)$

Q15.i)   Explain two methods for removal of hardness of water.

    ii)   Justify amphoteric nature of H_2O by giving reactions.

Q16. In surphur estimation, 0.157gm of an organic compound gave 0.4813 gm of barium sulphate, what is the percentage of sulphur in the compound?

($Atomic\ mass\ of\ Ba=137,\ S=32,\ O=16$)

Q17. Explain Huckle rule. Write necessary conditions for any system to be aromatic.

OR

How alkene (C_2H_4) reacts with O_3. What is this process called?

Q18. Complete the equations:

Q19. a) Explain the structure of Diborane.

b) Why Boric acid is a weak acid?

Q20. a) Write the functions of salt bridge.

b) Define disproportionation reaction with example.

Q21. i) Calculate the pH of 1.0×10^{-8}M solution of HCl.

ii) What is a buffer solution?

Q22. How Lithium resembles with Magnesuim diagonally?

Q23. When a certain system is in a state of equilibrium, both the forward and the backward processes proceed at the same speed i.e. it is of dynamic nature. For example Haber's process for the manufacture of ammonia is an exothermic reaction and reverse reaction is endothermic. Le Chatelier's principle helps in controlling the conditions of temperature, pressure and concentration which govern the system.

i) State the principle.

ii) The manufacture of ammonia is based on which industrial process?

iii) What is the condition of temperature for the process?

iv) What is the value associated with the optimum temperature for the process?

Q24. i) Calculate the formal charge on each atom in CO_3^{2-}

ii) Draw molecular orbital diagram of N_2. Find bond order and predict magnetic behaviour.

OR

i) Why He_2 does not exist?

ii) Discuss the hybridization of C_2H_2 with the help of orbital diagram.

Q25. a) Draw Cis and Trans Isomers of CHCl = CHCl

b) An organic compound contains 69% carbon and 4.8% hydrogen, the remaining being oxygen. Calculate the mass of CO_2 and H_2O produced when 0.20 gm of this substance is subjected to complete combustion.

OR

a) Will CCl_4 give white precipitates of AgCl on heating it with $AgNO_3$. Give reaction.

b) Write IUPAC names

Q26.   i) Why $SiCl_4$ can be hydrolysed but CCl_4 cannot be hydrolysed?
        ii) Write notes on (a) Silicones   (b) Silicates (c) Zeolites

OR

i)   Write reactions to show amphoteric nature of Aluminum.
ii)   Give reasons:
        a) Cone HNO_3 can be transported in Al container.
        b) BF_3 acts as a Lewis acid
        c) $PbCl_4$ acts as a powerful oxidizing agent