SAMPLE PAPER-02
CHEMISTRY (Theory)
(Question)
Class – XII

Time allowed: 3 hours Maximum Marks: 70

General Instructions:

a) All the questions are compulsory.
b) There are **26** questions in total.
c) Questions **1** to **5** are very short answer type questions and carry **one** mark each.
d) Questions **6** to **10** carry **two** marks each.
e) Questions **11** to **22** carry **three** marks each.
f) Questions **23**is value based question carrying **four** marks.
g) Questions **24**to **26** carry **five** marks each.
h) There is no overall choice. However, an internal choice has been provided in one question of two marks, one question of three marks and all three questions in five marks each. You have to attempt only one of the choices in such questions.
i) Use of calculators is **not** permitted. However, you may use log tables if necessary.

1. Write the structure of 1-chloro-2,2-dimethylpropane.
2. What is the effect of presence of Schottky defects on the density of the crystal?
3. If a compound is formed by the elements X and Y crystallises in the cubic arrangement with X atoms at the corners of a cube and Y atoms at face centres, then give its formula of the compound?
4. Give any two main functions of hormone adrenaline.
5. Define co-enzyme.
6. Explain brown ring test.
7. Explain:
   i. Electrophoresis
   ii. Dialysis
8. A compound is formed by two elements X and Y. If the atoms of the element Y (as anions) make ccpand those of the element X (as cations) occupy all the octahedral voids, then what is the formula of the compound?

Or

An element has a body-centred cubic structure with a cell edge of 288 pm. The density of the element is 7.2 g/cm^3. How many atoms are present in 208 g of the element?

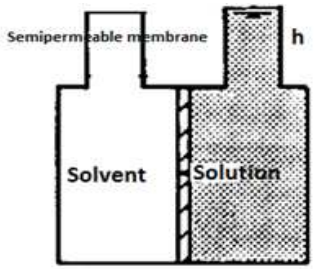
9. The initial concentration of N_2O_5 in the following first order reaction: $N_2O_5\ (g) \rightarrow 2\ NO_2\ (g) + 1/2\ O_2\ (g)$ was 1.24×10^{-2}mol/L at 318K. The concentration of N_2O_5 after 60 minutes was 0.20×10^{-2}mol/L. Calculate the rate constant of the reaction at 318 K.

10. What conclusions can be drawn from the equation: $P = p_1^0 + \left(p_2^0 - p_1^0\right) x_2$?
11.
    a) Identify all the possible monochloro structural isomers expected to be formed on free radical monochlorination of $(CH_3)_2CHCH_2CH_3$.
    b) During the reaction of alcohols with KI, sulphuric acid is not used. Give reason.
    c) Alkyl halides though polar, are immiscible with water. Why?
12. How the presence of sulphur dioxide is detected?
13. Vapour pressure of chloroform ($CHCl_3$) and dichloromethane (CH_2Cl_2) at 298 K are 200 mm Hg and 415 mm Hg respectively.
    a) Calculate the vapour pressure of the solution prepared by mixing 25.5 g of $CHCl_3$ and 40 g of CH_2Cl_2 at 298 K.
    b) The mole fractions of each component in vapour phase.
14. Complete the following reactions:
    a) $HgCl_2 + PH_3 \rightarrow$
    b) $NaClO_3 + I_2 \rightarrow$
    c) $SCl_2 + NaF \rightarrow$
15. Define the term:
    a) Monosaccharides
    b) Oligosaccharides
    c) Polysaccharides
16. Calculate the mole fraction of ethylene glycol ($C_2H_6O_2$) in a solution containing 20% of $C_2H_6O_2$by mass.
17. Give the formulae of the following complexes:
    a) Tetraaminedichloridocobalt (III) ion
    b) Amminechloridobis (ethane-1,2-diamine) cobalt (III) ion
    c) Potassium trioxalatoaluminate (III)

    Or

    Give some limitations of valence bond theory.

18. Calculate the values of *Ea* and *A*.
19. Differentiate globular proteins and fibrous proteins.
20. What are the different types of polymers based on the structure? Give an example each.
21. How are drugs classified?
22. Differentiate ideal and non-ideal solution.
23. if we apply pressure greater than the equilibrium osmotic pressure to the solution compartment shown below, pure solvent will flow from the solution to the solvent compartment.
    a. What is the name of this process
    b. Write an important application associated with this process. Explain

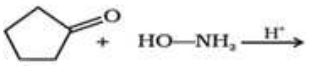


24. Give the name of the reagents to bring the following conversions:
    a. Allyl alcohol to propenal
    b. But-2-ene to ethanol
    c. Cyclohexanol to cyclohexanone
    d. Ethanenitrile to ethanol
    e. Hexan-1-ol to hexanal

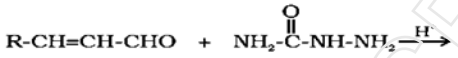
Or

Complete the reactions:

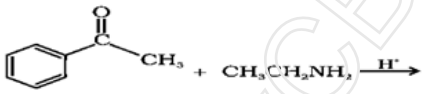
a.



b.



c.



25.
    a) Give the important advantages of fuel cells over ordinary batteries.
    b) Define molar conductivity and equivalent conductivity.

Or

    a) Represent the cell in which the following reaction takes place $Mg(s) + 2Ag^{+}(0.0001M) \rightarrow Mg^{2+}(0.130M) + 2Ag(s)$. Calculate its E(cell), if (cell) $E^{\Theta}_{cell} = 3.17$ V.
    b) Calculate the equilibrium constant of the reaction: $Cu(s) + 2Ag^{+}(aq) \rightarrow Cu^{2+}(aq) + 2Ag(s)$, if $E^{\Theta}_{cell} = 0.46$ V.

26.
    a) The standard electrode potential for Daniell cell is 1.1V. Calculate the standard Gibbs energy for the reaction: $Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$

b) If the limiting molar conductivities for Nacl, HCl and NaAc are 126.4, 425.9 and 91.0 S cm^2/mol respectively, then calculate Λ^0 for HAc.

Or

a) The conductivity of 0.001028 mol/L acetic acid is 4.95 x 10^{-5} S/cm. calculate its dissociation constant if the limiting molar conductivity for acetic acid is 390.5 S cm^2/mol.

b) Give a short not on nickel – cadmium cell. Give its overall reaction during discharge.