HIGHER SECONDARY SECOND YEAR

CHEMISTRY

MODEL QUESTION PAPER-III

TIME : 2.30 HOURS **MARKS : 70**

Note: Draw diagrams and write equations where ever necessary.

SECTION-I

Note: (i) Answer all the questions. **$15 \times 1 = 15$**

(ii) Choose the most suitable answer from the given four alternatives.

1. H_3PO_3 is a powerful reducing agent because it has.

   (a) O-H bond (b) P-O bond (c) O- P bond (d) P-H bond

2. Paramagnetism is the property of

   (a) Paired electrons (b) Completely filled electronic subshells.

   (c) Unpaired electrons (d) Completely Vacant electronic subshells.

3. Statement (I): The size of M^{3+} ions decreases as we move through the lanthanides.

   Statement (II): One 4f electron show perfect shielding by another in the same subshell.

   (a) Statement (1) is correct but Statement (II) is false.

   (b) Statement (I) and (II) are correct and Statement (II) is the correct explanation of Statement (I)

   (c) Statement (I) is false but Statement (II) is correct

   (d) Statement (I) and (II) are correct and Statement (II) is not correct explanation of Statement(I)

4. The geometry of complex ion $[Fe(CN)_6]^{4-}$ is

   (a) tetrahedral (b) Square planar

   (c) Octahedral (d) Triangular

5. Fill in the blank

$$_{11}Na^{23} + \xrightarrow{?} {}_{12}Mg^{23} + {}_{O}n^{1}$$

(a) $\propto$ (b) d (c) p (d) n

6. The enthalpy of vapourization of a liquid is 30 $KJmol^{-1}$ and entropy of vapouriztion is 75 J mol^{-1} K^{-1} its boiling point is

(a)600K (b) 500K (c) 400K (d) 300K

7. In the reversible reaction $2HI \rightleftharpoons H_2+I_2$, Kp is

(a) greater than Kc (b) less than Kc

(c) Equal to Kc (d) Zero

8. NH_4OH is a weak base because

(a) it has low vapour pressure.

(b) it is only partially ionized.

(c) it is completely ionized.

(d) it has low density.

9. Consider the following Statements.

(I) Order of a reaction may be zero, fractional or integral values.

(II) Order of a reaction can be determined theoretically.

(III) Higher order reactions are not common.

Which of the above Statement/s is/are not correct?

(a) I and III (b) I and II

(c) I,II and III (d) II and III

10. Match the List-I and List-II correctly by using the code given below.

List-I	List-II
(A) Haber's process	(1) Cupric chloride
(B) Contact Process	(2) Ferric Oxide
(C) Deacon's process	(3) Finely divided iron
(D) Bosch's process	(4) platinized asbestos

Codes;	(A)	(B)	(C)	(D)
(a)	(3)	(4)	(2)	(1)
(b)	(3)	(4)	(1)	(2)
(c)	(4)	(3)	(1)	(2)
(d)	(2)	(1)	(4)	(3)

11. A compound that undergoes bromination easily is

    (a) Benzoic acid

    (b) Benzene

    (c) phenol

    (d) toluene

12. Diethylether can be decomposed with

    (a) HI (b) $KMnO_4$

    (c) NaOH (d) H_2O

13. Benzophenone does not form additional product with sodium bisulphite because.

    (a) Steric hindrance of phenyl groups

    (b) phenyl groups reduce the activity

    (c) phenyl groups increase the activity.

    (d) Both a and b

14. The oil of winter green is

    (a) methyl acetate

    (b) methyl oxalate

    (c) methyl salicylate

    (d) methyl formate

15. Which one of the following is a tertiary amine

    (a) Ethyl amine

    (b) Dimethyl amine

    (c) tert- butyl amine

    (d) trimethyl amine

Section -II

Answer any six questions and question number 21 is compulsory **6x2=12**

16. State Heisenberg Uncertainty Principle.

17. Calculate the electro-negativity values of fluorine on Mulliken's scale given that (Ionization potential) F= 17.4 ev/atom, (Electron affinity) F=3.62 ev/atom.

18. What is the action of heat on copper sulphate crystals?

19. Write a note on the assignment of atoms per unit cell in fcc.

20. What is common ion effect ? Give example.

21. Determine the standard emf of the cell and predict its feasibility.

    $Ag, Ag^{+} \| H^{+}, H_{2(g)}$ l atm, pt

    The Standard reduction potential of Ag^{+}, Ag is 0.80v

22. How do you distinguish the three isomers of di-substituted Benzene using DPM(Dipole moment value)?

23. Why sucrose is a non reducing sugar?

24. What are food preservatives? Give example.

Section - III

Answer any six questions and question number 31 is compulsory. **6x3=18**

25. Mention the uses of Helium.

26. How Lanthinides are extracted from Monazite sand?

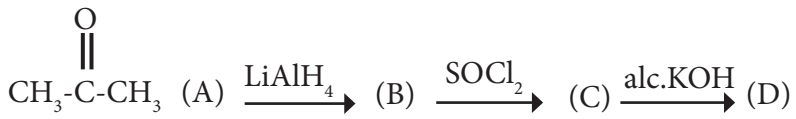
27. Explain coordination and ionization isomerism with suitable examples.

28. Derive a general relationship between Kp and Kc for a equilibrium reaction.

29. Distinguish between simple and complex reaction.

30. Explain electro osmosis.

31. Identify (B),(C) and (D)



32. Give the mechanism involved in the esterification of a carboxylic acid with alcohol.

33. How can the following conversion be effected?

(a) Nitrobenzene to anisole

(b) Aniline to Iodobenzene.

Section -IV

Answer all the questions **5x5=25**

34. (i) Draw the MO diagram of N_2 molecule and predict its Bond order. (3)

(ii) How Ionization energy is affected by atomic size and nuclear charge. (3)

(or)

(i) Discuss the chemistry behind Holme's signal. (2)

(ii) Explain the extraction of zinc from its ore. (3)

35. (i) Write the common and maximum Oxidation state of lanthanides.

(ii) Mention the function of haemoglobin.

(or)

(i) What is Spallation reaction? (2)

(ii) Give the uses of radio active isotopes in medicine. (3)

36. (i) Explain Bragg's Spectrometer method. (3)

(ii) State Lechatelier's principle. (2)

(or)

(i) State various Statements of II law of thermodynamics. (3)

(ii) The initial rate of a first Order reaction is 5.2×10^{-6} mol lit^{-1} S^{-1} at 298k. When the initial concentration of reactant is 2.6×10^{-3}mol. lit^{-1} calculate the first order rate constant of the reaction at same temperature. (2)

37. (i) Derive Henderson equation. (3)

(ii) Using IUPAC convention write the cell diagram for zinc-copper cell. (2)

(or)

(i) Describe the conformations of cyclohexanol, comment on their stability. (3)

(ii) Give the possible Ether isomers for molecular formula $C_4H_{10}O$. (2)

38. (i) An organic compound (A) of molecular formula C_6H_6O gives violet colour with neutral $Fecl_3$ (A) gives maximum of two isomers (B) and (C) when an alkaline solution of (A) is refluxed with CCl_4 (A) also reacts $C_6H_5N_2Cl$ to give compound (D) which is a red orange dye. Identify (A),(B),(C) and (D). Explain with suitable chemical reaction. (5)

(or)

(i) How is the Structure of glucose elucidated. (3)

(ii) What are chromophores? Give examples. (2)