HIGHER SECONDARY SECOND YEAR

CHEMISTRY

MODEL QUESTION PAPER-I

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

List-I	List -II
(A) Debroglie Relation	(1) $\Delta x\, \Delta p \geq h/4\pi$
(B) Bohr's quantum condition	(2) $E_n = -2\pi^2 me^4 / n^2h^2$
(C) Energy of an electron in an atom	(3) $2\pi a = n\lambda$
(D) Uncertainty Principle	(4) $\lambda = \frac{h}{mv}$

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

2. The lightest gas which is non-inflammable is

(a) He (b) H_2 (c) N_2 (d) Ar

3. Consider the following statements;

(I) d-block elements are coloured because they absorb some energy for d-d transition.

(II) $K_2Cr_2O_7$ is a powerful reducing agent.

(III) Oxidation state of Ni in $Ni(CO)_4$ is Zero

Which of the above Statement/s is/are correct?

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

4. Ceria is used in

(a) toys (b) tracer bullets (c) gas lamp material (d) all the above

5. The time taken for 10g of initial amount of a substance to become 5g in a decay is 'X' hours and for 1g of initial amount to become 0.5g in the same decay is 'y' hours, then

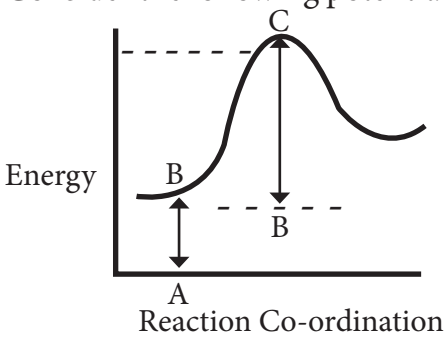
(a) x >y (b)x <y (c) x = y (d) x >>y

6. Rutile is _____
   (a) TiO_2 (b) Cu_2O
   (c) MoS_2 (d) Ru

7. For the reaction $2Cl_{(g)} \rightarrow Cl_2$, the signs of ΔH and ΔS respectively are
   (a) +,- (b) +,+ (c) -,- (d) -,+

8. 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

9. Consider the following potential energy diagram and Identify the correct representation.



   (a) AB- Activation Energy
   (b) BC- Threshold Energy
   (c) BC - Activation Energy
   (d) AB- Threshold Energy

10. Water soluble dye is mixed with emulsion and emulsion remains colourless then the emulsion is
   (a) o/w (b) w/o (c) o/o (d) w/w

11. The Compound that reacts fastest with Lucas reagent is
   (a) Butan - 2- ol (b) Butan - 1- ol
   (c) 2-methyl propan -1-ol (d) 2-methyl propan -2-ol

12. According to lewis concept of acids and bases, ethers are
   (a) Neutral (b) Acidic
   (c) Basic (d) Amphoteric

13. When Benzaldehyde is treated with HCN followed by hydrolysis it yields.
   (a) Benzoic acid (b) Lactic acid
   (c) Maleic acid (d) Mandelic acid

14. Statement (I) Lower members of carboxylic acids are highly soluble in water
Statement (II) This is due to hydrogen bonding between acids and water
(a) Statement(I) is correct but Statement (II) is false
(b) Statement (I) and (II) are correct and Statement (II) is the correct explanation for Statement (I)
(c) Statement(I) is false but statement (II) is Correct
(d) Statement (I) and (II) are correct and Statement (II) is not a correct explanation for Statement(I)

15. Which of the following answers Carbylamine Reaction.
(a) Ethyl amine (b) Sec- butylamine
(c) tert-butylamine (d) all the above

Section - II

Answer any six questions and question number 23 is Compulsory 6x2=12

16. A triprotic Oxy acid of phophorus reacts with Ag NO_3 to give a yellow precipitate. Write the suitable reaction.

17. Give the formula for the given complexes.
(a) Tris (ethylenediammine) cobalt(III) chloride
(b) Triamminetrinitro cobalt (III)

18. What is Q value of a nuclear reaction?

19. What is pseudofirst order reaction? Give an example.

20. State Kohlrausch's law.

21. The Standard reduction potential for the reaction $Sn^{4+} + 2e^- \rightarrow Sn^{2+}$ is +0.15v. Calculate the free energy change of the reaction.

22. Draw the cis and trans form of 2-pentene.

23. Substantiate with suitable evidence that in fructose the ketone group is adjacent to one of the terminal carbon atom.

24. Mention the characteristics of dyes.

Section - III

Answer any six questions and questions number 29 is compulsory. 6x3=18

25. The uncertainty in the position of a moving bullet of mass 10g is 10^{-5}m calculate the uncertainty in its velocity.

26. Explain the factors affecting Ionization Energy.

27. Discuss the structure of AX_3 and AX_7 interhalogen compound.

28. Show that decrease in free energy change is equal to net work done by the system.

29. Derive an expression for Kc for decomposition of PCl_5

30. Explain the cell terminologies used in Electrochemical cell.

31. When Organic compound $C_3H_8O_3$ is acetylated with acetic arhydride it gives $C_9H_{14}O_6$. How many -OH groups are there in the compound? write the structure and reaction.

32. Distinguish between diethylether and anisole.

33. Explain the mechanism of aldol condensation reaction.

Section - IV

Answer all the questions. (5x5=25)

34. (i) Draw the Molecular Orbital diagram for Oxygen molecule and calculate its Bond order (3)

    (ii) How do electro-negativity values help to find the nature of Bond. (2)

    (or)

    (i) Discuss the consequences of lanthanide contraction. (3)

    (ii) $[Ni(CN)_4]^{2-}$ is square planar where as $[NiCl_4]^{2-}$ is tetrahedral why? (2)

35. (i) Explain the Extraction of Gold from its ore. (3)

    (ii) What is philosopher's wool? How is it prepared? (2)

    (or)

    (i) Write notes on Schottky defect. (3)

(ii) Define Entropy and give its unit (2)

36. (i) State the optimum condition to obtain maximum yield of NH_3 in Haber's process(2)

(ii) write note on consecutive and parallel reaction with Example. (3)

(or)

(i) write the preparation of colloids by condensation method. (3)

(ii) What is the electrochemical equivalent of a substance when 150gm of it is deposited by 10 ampere of current passed for 1 sec? (2)

37. (i) Discuss the optical isomerism in tartaric acid. (3)

(ii) $\begin{matrix} CH_2 \\ \| \\ CH_2 \end{matrix} \xrightarrow{HOCl} A \xrightarrow{Ca(OH)_2} B$. Identify A and B (2)

(or)

(i) How does formaldehyde react with NH_3 and CH_3MgI/H_2O, H^+?

(ii) Substantiate with suitable reason that chloroacetic acid has more acid strength than acetic acid. (2)

38. (i) An Organic Compound (A) with molecular formula C_2H_7N dissolves in acid solution. It reacts with $NaNO_2$ / HCl to give (B) of molecular formula C_2H_6O. (B) reacts with acetic anhydride forming a pleasant smelling liquid (C) Identify A,B,C. Explain the reactions. (3)

(ii) Convert aniline to S- diphenylthiourea (2)

(or)

(i) Give evidences to show glucose has a aldehyde group, 6 carbon linear chain, 5-OH groups (3)

(ii) How is Nylon 66 prepared. (2)