

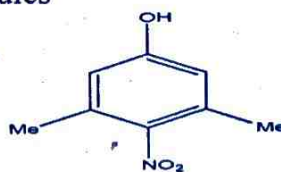
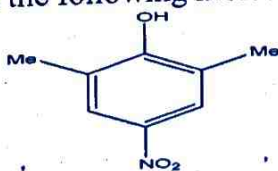
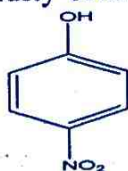
**C-4**  
**Sessional Examination, B.Sc. 3<sup>rd</sup> SEM Chemistry Major, 2024**

**Marks: 40**

**Time: 1.30 h**

1. Explain substitution reaction in octahedral complexes. [2]
2. Answer any **two** of the following: [2x2=4]
  - a. Write about inert and labile complexes with examples
  - b. Write about association, dissociation and concerted paths in inorganic reaction mechanism.
  - c. Explain trans effect giving example. [1+1=2]
3. What is solvent leveling? Explain with example? [2]
4. Define Lewis definition of acid and base? Explain with example? [2]
5. What is conjugate acid and base? Can we speak about the reactivity of an acid or base in terms of the stability of conjugate acid and base? Explain with a suitable example? [2]
6. HSAB principle is helpful in defining the stability of an acid base pair. Define the statement with an example? [2]
7. Answer the following (any three). [2x3=6]
  - (a) Define specific and molar conductance.
  - (b) Explain Kohlrausch law of independent migration of ions.
  - (c) Define Wien effect and Debye-Falkenhagen effect.
  - (d) Define transport number. Write the names of two methods used for determination of transport number of ions.
  - (e) Write a note on (any one).
    - (i) Anomalous transference number
    - (ii) Ionic mobility
8. Answer the following questions: [1 x 2 = 2]
  - i) The emf of a galvanic cell, will electrode potentials of silver = + 0.80V and that of copper = 0.34 V, is a) - 1.1 V b) - 1.1 V c) + 0.46 V d) - 0.46 V
  - ii) If  $e_1$  is the electrochemical equivalent of an element of chemical equivalence  $E_1$ . The electrochemical equivalent of an element of chemical equivalence  $E_2$  is  $E_2E_1/e_1$  b)  $E_1/e_1E_2$  c)  $e_1E_1/E_2$  d)  $e_1E_2/E_1$
9. Derive Nernst equation for a Daniell cell [2]
10. The EMF of the cell  $\text{Cd}, \text{CdCl}_2 \cdot 2.5\text{H}_2\text{O} (\text{saturated}) \parallel \text{AgCl(s)}, \text{Ag}$  in which the cell reaction is  $\text{Cd (s)} + 2\text{AgCl (s)} + \text{aq} \rightleftharpoons \text{CdCl}_2 \cdot 5/2 \text{H}_2\text{O (sat.)} + 2\text{Ag (s)}$  is 0.6753 V at 25 °C and 0.6915 V at 0 °C. Calculate the free energy change, enthalpy change and entropy change of the cell reaction at 25 °C. [3]

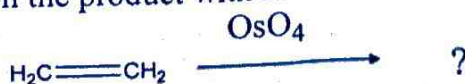
11. Explain the acidity order of the following molecules [2]



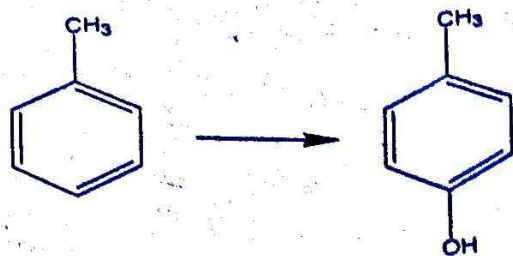
12. In Kolbe-Smith reaction, Na metal form ortho product but not K- metal. Explain with mechanism. [2]

13. Answer any two of the following questions [2x2=4]

- a. In between 1°, 2° and 3° isomer of butanol which one has more solubility and why?
- b. Write down the product with mechanism



- c. Complete the reaction.



14. Pyrrole is an Aromatic Compound. Explain.  
15. Define antiaromaticity and non-aromaticity with examples.  
16. Explain the directing effect of  $-\text{NH}_2$  group in Aniline.

[2]

[2]

[1]