Gurudas College

Internal Assessment Examination, 2020

Subject-CEMA, SEM-I

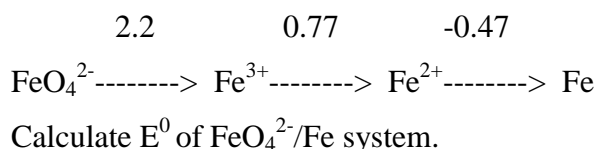### Paper- CC-1-1

**Full Marks-10**   **Time-30 mins**

Answer <u>any 10</u> questions (questions are of 1 mark each)

1. What are the values of the n, l, m_l quantum numbers that describe the 5f orbitals?

2. Calculate the number of nodes in the radial distribution function curve of 3s and 6d orbitals.

3. Calculate the ground state term symbol for V^{2+}.

4. Justify which one is stronger acid---H_3PO_4 or H_3PO_3.

5. Predict the direction of the following equilibrium: $HgF_2 + BeI_2 <===> HgI_2 + BeF_2$

6. Which will be most basic towards BMe_3: Me_3N or Et_3N?

7. From the following Latimer diagram:

$$2.2 \qquad\qquad 0.77 \qquad\qquad -0.47$$
$$FeO_4^{2-} \text{--------> } Fe^{3+} \text{--------> } Fe^{2+} \text{--------> } Fe$$

    Calculate E^0 of FeO_4^{2-}/Fe system.

8. Define Formal Potential.

9. Write Nernst Equation at $25^{\circ}C$ for the half cell

$$MnO_4^- + 8\,H^+ + 5e \text{ -----> } Mn^{2+} + 4H_2O$$

10. Write one purpose of adding H_3PO_4 in the titration of Fe^{2+} by $K_2Cr_2O_7$ using BDS as indicator.

11. Give the formal charge on 'N' in the following structure: $—C\equiv N—H$

12. Compare the dipole moment of CH_3F and CH_3Cl.

13. Calculate ΔH° for the following reaction.

$$CH_3CH_2Br + H_2O \longrightarrow CH_3CH_2OH + HBr$$
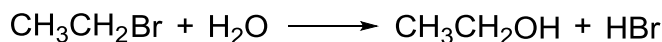
    Bond dissociation energy for CH_3CH_2-Br = 285 KJ/mol, $H-OH$ = 498 KJ/mol, CH_3CH_2-OH = 393 KJ/mol and $H-Br$ = 368 KJ/mol.

14. Which one is more stable and why?
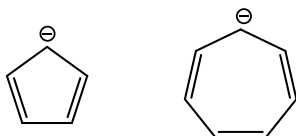
15. Give one example of steric inhibition of resonance.