Sessional Exam 2024

North Gauhati College

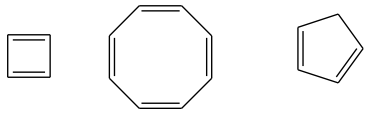
Semester : III (FYUGP)

Subject : Chemistry III

Total marks: 30 **Time: 1.5 hr**

The figures in the margin indicate full marks for the questions

1. Answer ***any two*** questions: 1×2=2
   i) Give an example of a soft base.
   ii) What are superacids ?
   iii) Define proton affinity.
   iv) What is HSAB principal?
2. Out of NH_3 and NF_3 which is more basic and why? 2
3. Answer ***any two*** of the following questions: 3×2=6
   i) Explain levelling and differentiating effect of solvents with examples.
   ii) What is galvanic cell? Explain with a suitable example.
   iii) Arrange the following in order of increasing pKa values and also give reasons:
   $HClO_2$, $HClO_3$, HClO, $HClO_4$
4. State the Huckel's rule of aromaticity . What do you mean by anti-aromatic and non-aromatic? Select the aromatic, non-aromatic and anti-aromatic compounds from the following. 1+2+3=6



5. Give the machanism of substituted nucleophilic aromatic reaction(S_NAr). Give one preparation of each of alkyl and aryl halide. 4

   Or

   How can you distinguish 1º, 2º and 3º alcohol? Which one is more acidic out of alcohol and phenol?

Answer the followings:

6. What do you mean by 1×3=3
   (a) Partial molar volume
   (b) Chemical potential
   (c) Fugacity
7. Explai physical significance of chemical potential. 2
8. Derive Gibbs Duhem equation. 3
9. Derive the followings: 2
   (a) $dG= -SdT + VdP + \sum_i \mu_i dn_i$
   (b) $dH= TdS + VdP + \sum_i \mu_i dn_i$