**ST. JOSEPH’S COLLEGE (AUTONOMOUS) BANGALORE – 27**

**B.Sc. CHEMISTRY – IV SEMESTER**

**SEMESTER EXAMINATION: APRIL-2017**

**CH 415 – Chemistry**

**Time: 1 ½ Hours Maximum Marks: 35**

**Note:** This question paper has **TWO** printed pages and **THREE** parts.

**PART-A**

**Answer any THREE of the following questions. 3 X 2 = 6**

1. Write the structure of (a) orthophosphoric acid (b) Mashall’s acid
2. Explain the reducing property of phosphorous acid with an example.
3. What is the common oxidation state exhibited by oxygen and why?
4. Explain the anomalous behavior of fluorine with an example.
5. What is metastable equilibrium?

**PART-B**

**Answer any FOUR of the following questions. 4 X 6 = 24**

1. (a) Explain the phase diagram of water system.

(b) What are eutectic mixtures? **(4+2)**

1. (a) Derive the rate expression for a general acid catalyzed reaction.

(b) What is heterogeneous catalysis? Give an example. **(4+2)**

1. (a)Discuss the structure of XeF6 based on the concept of hybridization.

(b) Explain the variation of oxidation power of halogens**. (4+2)**

9) (a) Explain the mechanism of nitration of benzene.

 (b) State Huckel’s rule. **(4+2)**

10) (a) Explain the structure of benzene based on resonance theory.

 (b) What are antiaromatic species? Give an example. **(4+2)**

11) Explain how you would prepare the following using Grignard reagent.

 (a) A secondary alcohol (b) An aldehyde

**PART-C**

**Answer any ONE of the following questions. 1 X 5 = 5**

12) (a) Is sodium ethoxide an organometallic compound? Justify your answer.

 (b) Between toluene and chlorobenzenewhich is more reactive towards electrophilicsubstitution reaction and why?

 (c) Meta directing groups are deactivators. Why? **(2+2+1)**

 13) (a) Name the electro file involved in the sulphonation of benzene. Why does it act so?

 (b) How do you convert toluene into metanitrobenzoic acid?

 (c) Calculate the number of components in the system

 NH4Cl (v) ⮀ NH3(g) + HCl(g) **(2+2+1)**

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