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**Registration number:**

**Date:**

**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU - 27**

**BSc. CHEMISTRY – IV SEMESTER**

**SEMESTER EXAMINATION – APRIL 2019**

**CH 415: Chemistry**

**Time: 1½ h** **Max marks: 35**

This paper has **TWO** printed pages and **THREE** parts.

**PART A**

Answer any **THREE** of the following. 3x2 = 6

1. Draw the structure of Caro’s and Marshall’s acids.

2. What are interhalogen compounds? Give an example.

3. Define catalytic promoter. Give an example.

4. Show Lewis structure of nitrous oxide and calculate oxidation number of nitrogen.

5. Mention if the following are aromatic or anti-aromatic.



**PART B**

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

6. a) Draw the energy profile diagram for an electrophilic aromatic substitution reaction.

b) Show the mechanism of nitration of benzene. (2+4)

7. a) Draw and explain the phase diagram of Pb−Ag system. Give its application in Pattinson’s process.

8. Using concept of resonance stabilization of intermediate arenium ions, explain the orientation effect of phenolic (−OH) functional group of phenol in electrophilic substitution reactions.

9. a) Draw any two oxyacids of phosphorus which show reducing property.

b) Draw the structures of IF7 and BrF5. (atomic numbers: I=53, F=9 and Br= 35) (3+3)

10. Explain the structure of XeO3F2  based on hybridization. (atomic numbers: Xe= 54, F=9, O=8)

11. Derive the rate expression for general and specific acid catalyzed reactions.

**PART C**

Answer any **ONE** of the following. 5x1 = 5

12 a) HF is a liquid whereas HCl and HBr are gases at room temperature. Explain.

b) How do you bring about the following conversion? Give reagents and equations for the same.



(1+4)

13 a) Calculate the number of phases, components and degrees of freedom for an aqueous solution of NaCl.

b) Complete the following synthesis by filling in the missing reagents/products.

 (2+3)