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CH/AC/OC/CA 401

I Semester M.Sc. Degree Examination, December 2018
CHEMISTRY/APP.CHEMISTRY/ORGANIC CHEMISTRY/ANALYTICAL
CHEMISTRY
Inorganic Chemistry (2015 Batch)
(CBCS Repeaters)

Time : 3 Hours

Max. Marks : 70

Note : i) Answer Part – A and **any five** questions from Part – B.
ii) Figures to the **right** indicate marks.

PART – A

1. Answer **any ten** sub-divisions : **(10×2=20)**
- Give the resonance structures of CO_3^{2-} and NO_2^- .
 - State and explain Kapustinskii equation for the lattice energy of an ionic crystal.
 - What are pseudo- halogens ? Give any two properties of them.
 - Explain why graphite is suited for the formation of intercalation compounds.
 - What is meant by levelling effect of solvent ? Explain.
 - Give the classification of silicates with an example each.
 - " SOCl_2 behaves as an acid in anhydrous SO_2 ". Justify the statement.
 - Strong oxidising agents do not exist in liquid ammonia. Why ? Explain.
 - What is synergistic extraction ? Give an example.
 - In the extraction of Al(III) with oxine in chloroform the volume of each of aqueous and organic phase was 25 ml with the percentage of extraction of 95. Calculate the distribution ratio.
 - Explain t-and F-tests with an example each.
 - Highlight the industrial applications of masking.

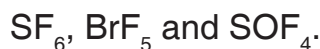
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PART – B

(5×10=50)

2. a) Using VSEPR theory, discuss the shapes of the following compounds.



b) Describe the structure of CsCl crystal. (6+4)

3. a) Explain the covalent character of ionic compounds using Fajan's rule with an example.

b) Derive the Born-Landé equation for the lattice energy of NaCl solid.

c) Construct the MO diagram of NO. (4+3+3)

4. a) Discuss the structure and bonding in XeOF_4 and XeO_3 .

b) Explain how the zeolites function as shape selective catalysts.

c) What are crown ethers ? Explain. (4+3+3)

5. a) Give the structure of phosphorus, hypophosphorus and phosphoric acids. Explain their basicity.

b) Explain how ultrapure silicon can be obtained.

c) Discuss the oxy acids of phosphorus. (4+3+3)

6. a) Explain HSAB concept and discuss their advantages and limitations.

b) What are super acids ? What is their significance ?

c) Discuss the acid-Base concept in non-aqueous solvent media by taking N_2O_4 as an example. (4+3+3)



7. a) Explain Pearson's concept of hard and soft acids and bases. Highlight its applications.
- b) Discuss the different types of reactions studied in liquid NH_3 . Explain its limitations. **(5+5)**
8. a) What are masking agents ? Illustrate with examples the applications of masking and demasking agents in quantitative analysis.
- b) What is batch extraction ? Derive an expression for the traction of a solute from its solution efficiently. **(5+5)**
9. a) Explain the principle involved in solvent extraction. Discuss its applications.
- b) What are determinate and indeterminate errors ? Explain.
- c) Write a note on sampling of solids for chemical analysis. **(4+3+3)**
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