

B. Sc. (Hons.) Chemistry (Semester : 4th)
INORGANIC CHEMISTRY-II
Subject Code: BCHMS1401
Paper ID: [19131623]

Time: 03 Hours

Maximum Marks: 60

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A

(2 marks each)

Q1. Attempt the following:

- a. What is zone refining?
- b. What do you understand by levelling effect of solvents?
- c. Out of trimethylamine and ammonia, which is more basic and why?
- d. What is the cause of diagonal relationship?
- e. Discuss the structure of beryllium acetate.
- f. Describe the difference in structure between CaH_2 and BeH_2 .
- g. Why boric acid is not an acid in protonic concept?
- h. Explain the chemistry of ring test.
- i. Write chemical equations for action of water on P_4O_6 and P_4O_{10} .
- j. Write four applications of phosphazenes.

Section – B

(5 marks each)

- Q2. What is Ellingham diagram? Out of carbon and CO, which is better reducing agent for FeO and ZnO? Explain using Ellingham diagram.
- Q3. What do you mean by anomalous behaviour? What is its cause? Write some characteristics of Be showing its anomalous behaviour.
- Q4. What are carboranes? Explain its various types with one example each.
- Q5. What is borazine? How is it synthesized? Explain its structure.
- Q6. (i) Explain structure and bonding in diborane.
(ii) Why orthophosphoric acid is tribasic while phosphorous acid is dibasic?

Section – C

(10 marks each)

- Q7. (i) Explain HSAB principle with examples. Using this principle, explain why AgI is insoluble in water?
(ii) What is inert pair effect? What is its cause? Explain, Why PCl_5 exists but NCl_5 does not?
- Q8. (i) What are interhalogen compounds? Why they are more reactive than parent halogens? Discuss the geometry of ClF_3 and IF_5 .
(ii) What are silicates? Discuss its various types.
- Q9. (i) Describe Electrolytic Kroll process.
(ii) What are ionic and covalent hydrides? Give one example of each.
(iii) Discuss the acidic behaviour of oxoacids of chlorine.
(iv) Write two methods of preparation and two chemical properties of XeF_2 . Draw its structure also.