

91552

B.Sc. 2nd Semester New Scheme Examination,

May-2017

BIOTECHNOLOGY

Paper-BT-206

Inorganic Chemistry

Time allowed : 3 hours] [Maximum marks : 40

Note : Attempt five questions in all, selecting at least one question from each section. Q.No. 1 is compulsory. All questions carry equal marks.

1. Compulsory question :

- (a) Why alkali metals are more reactive than alkaline earth metals ? 1
- (b) What are chalcogens ? 1
- (c) IQ_7 does not exist while IF_7 exist. Why ? 1
- (d) What are carbides ? Name the types of carbides. 1
- (e) Describe the difference in structure between CaH_2 and BeH_2 . 2
- (f) What are Vander Waal's radius and covalent radius of atoms ? Which one is smaller ? 2

Section-A

2. (a) "Density of ice is less than that of water."
Explain. 3
- (b) What are the characteristic results associated with Vander Waal's forces of attractions? 3
- (c) Which one has higher boiling point and why?
(i) ortho-nitrophenol (ii) para-nitrophenol. 2
3. (a) Explain band model for metal bonding. How is it different from free electron model? 6
- (b) Illustrate with sketches the development of London forces of attraction among the non-polar species. 2

Section-B

4. (a) What is diagonal relationship? Explain by taking an example of Be and Al. 3
- (b) Explain the biological and thermodynamic significance of Mg^{++} and Ca^{++} ions in animal bodies. 3
- (c) Why is it difficult to store XeF_6 in glass or quartz vessel? 2

5. (a) What do you understand by primary and secondary solvation shell ? How these two solvation processes help to decide the ionic mobilities of alkali metal cations ? 4
- (b) Draw and discuss the structure of the compounds :
- (i) XeOF_4 (ii) XeO_2F_2 4

Section-C

6. (a) How does Borazine reacts with (i) water (ii) CH_3OH and what happens when the product is heated to 370 K. 3
- (b) What are silicates ? Draw and discuss the structures of pyro, cyclic, chain and sheet silicates. 5
7. (a) Discuss the structure of AlCl_3 . 2
- (b) What are electron deficient compounds ? How do you account for the structure of diborane in terms of three centre electron pair bond ? 4
- (c) What are fluorocarbons ? Mention the industrially important fluoro carbons. 2

Section-D

8. (a) Draw and discuss the structures of H_3PO_2 , H_3PO_3 and H_3PO_4 . 3
- (b) Name the six oxyacids of sulphur and give their only structural formulae. 3
- (c) Why interhalogen compounds are always diamagnetic? 2
9. (a) Discuss the structure of yellow and red phosphorus. 3
- (b) Name the various oxyacids of chlorine and explain their relative strengths. 5