

B.Sc. 2nd Semester (Latest)

Examination, May-2023

BIO-TECHNOLOGY

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. Question no.1 is compulsory.

1. (a) What kind of hydrogen bonding is present in o-nitrophenol? 8×1=8
- (b) Which alkali metal is used in photoelectric cell?
- (c) Why do noble gases are monotomic?
- (d) What is the oxidation state of Xenon in XeO_4 ?
- (e) What is the shape of IF_5 molecules?
- (f) Give cause of anomalous behaviour of Lithium?
- (g) What is inorganic benzene?
- (h) H_3PO_4 is a tribasic acid, why?

Section-A

2. (a) How does band theory explain electrical conductivity of metals? 4
- (b) Discuss the various types of van der Waals forces. 4

3. (a) **P-nitrophenol has a higher boiling point than o-nitrophenol. Explain.** 2
- (b) **Discuss intrinsic and extrinsic semiconductors.** 3
- (c) **Give some application of semiconductors.** 3

Section-B

4. (a) **Draw and discuss structure of XeF_4 , XeOF_4 and XeO_3 .** 6
- (b) **Explain the following:**
- (i) **Li forms normal oxide, Na the peroxide and K the superoxide.** 1
- (ii) **Alkaline earth metals are less electropositive than alkali metals.** 1
5. (a) **How the hydrides of s-block element act as powerful reducing agents?** 2
- (b) **Write the function of alkaline earth metals in bio- systems.** 2
- (c) **Give the reaction of partial and complete hydrolysis of XeF_6 and also reaction with SiO_2 of XeF_6 .** 2
- (d) **Why Xenon forms compounds only with oxygen and fluorine.** 2

Section-C

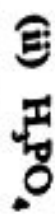
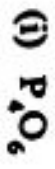
6. (a) **Discuss structure and bonding in diborane (B_2H_6).** 3
- (b) **What are Carbides? Discuss interstitial Carbides.** 3

(c) Complete the following reactions:



7. (a) What are silicones? Give their general method of preparation, properties and uses.

(b) Draw the structure of:



(c) NO is paramagnetic. Explain.

Section-D

8. (a) Why pentahalides are more covalent than trihalides?

(b) Draw the structure H_3PO_2 and HNO_2 . Also show their basicities.

(c) Differentiate between the structures of white phosphorus and red phosphorus.

(d) Describe the acidic nature of H_2O_2 with suitable examples.

9. (a) Why Sulphurous acid acts as a reducing agent?

(b) Explain why H_2SO_4 is highly viscous?

(c) Oxygen shows an oxidation state -2 in most compounds whereas other members of its family show oxidation of +2, +4 and +6. Explain.

(d) "Halogens are most reactive elements as well as most electronegative." Comment.