SG-547

Seat No.	

Total No. of Pages : 3

M.Sc. (Part - I) (Semester - II) (NEP) Examination, March - 2023
CHEMISTRY/APPLIED CHEMISTRY/INDUSTRIAL CHEMISTRY
Inorganic Chemistry-II (Paper-V)
Sub. Code : 90163/90073

Day and Date : Tuesday, 13 - 06 - 2023 **Total Marks: 80**

Time : 10.30 a.m. to 1.30 p.m.

Instructions:
1) Attempt in all Five questions.
2) Question No. One is compulsory.
3) All questions are equal marks.
4) Attempt any two questions from Section-I and any two questions from Section-II.
5) All sections should be written in the same answer book.
6) Figures to the right indicate full marks.
7) Neat labeled diagram should be drawn wherever necessary.

Q1) Answer the following. **[16]**

a) "Lanthanide complexes are usually coloured". Why?

b) Who discovered the Uranium?

c) "The spectral lines from the actinides are 10 times as intense as lanthanides". Why?

d) Which is the most rapid method for separation of lanthanides?

e) In Frenkel defect, the observed density is_____ as theoretical density.

f) What is the effect of temperature on electrical conductivity of conductors?

g) What is function of Haemoglobin?

h) Which metals helps in nitrogen fixation process?

i) "HF has highest boiling point to that of its corresponding hydrogen halides". Why?

j) What is the product of following reaction?

$CaC_2 + 2H_2O \rightarrow ..... + Ca(OH)_2$

P.T.O.

M.Sc.I Semester II (2022-23)

k) Write the formula of arachno boranes.

l) What are allotropic forms of phosphorous?

m) How many lone pairs are found in XeF_2 species?

n) Among PH_3 and PF_3, which species has more bond angle and why?

o) Perchloric acid behaves as_____ In anhydrous sulphuric acids.

p) What is non-aqueous solvent?

SECTION-I

Q2) a) What do you mean by the crystal defects? Explain different types of crystal defects in solids? [8]

b) Write note on synthesis and properties in boranes. [4]

c) Explain colour and absorption spectra of actinide. [4]

Q3) a) Discuss the physical and chemical properties of liquid ammonia and sulphur dioxide. [8]

b) Explain the Bent rule with illustrations. [4]

c) Write note on Phosphazenes. [4]

Q4) a) What is polymorphism? Discuss the polymorphism of Carbon. [8]

b) Explain the mechanism of nitrogen fixation. What are the enzymes involved in nitrogen fixation. [4]

c) Explain applications of actinide compounds in industries. [4]

SECTION -II

Q5) a) Write the general electronic configuration of lanthanoids. Discuss the optical and magnetic properties of lanthanides with suitable examples. [8]

b) How S_4N_4 is prepared? Draw its structure. [4]

c) Explain structure and bonding in interhalogens. [4]

Q6) a) How VSEPR theory is useful for predicting the geometry of representation compounds? Explain with at least two examples of compounds having AB_2, AB_3, AB_4 formulae. [8]

b) Calculate the distance between Na^+ and Cl^- ions in NaCl with a density 2.165 g/cm^{-3}? [4]

c) Explain conductor, insulator and semiconductor from band theory. [4]

Q7) Write short notes on any three of the followings: [16]

a) Physical and Chemical properties of sulphur dioxide.

b) Pπ-dπ bonding and dπ-dπ bonding with examples

c) Oxoacids of sulphur.

d) Applications of f-block compounds in Industries.

e) Walsh diagram.

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