Exam.Code:0002
Sub. Code: 0151

2071
B.A./B.Sc. (General) Second Semester
Chemistry
Paper – V: Inorganic Chemistry – B
(Same for B.Sc. Microbial and Food Technology)

Time allowed: 3 Hours | Max. Marks: 22

NOTE: *Attempt five questions in all, including Question No. IX (Unit-V) which is compulsory and selecting one question each from Unit I-IV.*

x-x-x

UNIT - I

I. a) Draw and discuss the structure of Cesium chloride.

b) Explain radius ratio rule. How this rule helps in predicting structure of ionic solid. (2,2)

II. a) What is basic difference in p-type and n-type semiconductor? Explain

b) What are the consequences of metal excess defects? (2,2)

UNIT - II

III. a) Calculate the lattice energy of NaCl crystal by using Born Haber cycle from the following Thermodynamic data. Sublimation energy of sodium=108.7 kj/mole, dissociation energy of Cl_2=225.9 kj/mole, ionisation energy of sodium is = 489.5 kj/mole, heat of formation of NaCl = -414.2 kj/mole, electron affinity of Cl=-351.4 kj/mole.

b) Why silver halide have low solubility in water? (2½, 1½)

IV. a) Using metallic bond free electron model explain why conductivity of metal decreases with increase in temperature.

b) Explain why Li_2Co_3 is unstable while Na_2Co_3 is quite stable.

c) NH_3 has high bowling point than PH_3. (2,1,1)

P.T.O.

UNIT - III

V. a) Co_2 is a gas whereas Sio_2 is a solid. Explain.

b) Discuss the structure of diborane.

c) What is interstitial carbide? (1,2,1)

VI. a) What are fluorocarbons? Name one fluorocarbon which is used as a refrigerant.

b) BF_3 is weaker Lewis acid than BCl_3 explain.

c) Boron form no compound in unipositive state but thallium from. Explain. (1,2,1)

UNIT - IV

VII. a) Nitric acid acts only as an oxidizing agent while nitrous acid can act both oxidizing as well as reducing agent. Why?

b) Draw the structure of H_3PO_2 and HNO_2 and also give there basicities. (2,2)

VIII. a) Why interhalogen compounds are more reactive than halogens?

b) Why are pentahalide more covalent than tri halide?

c) Give the chemical reactions involved in contact process for manufacturing the sulphuric acid. (1,1,2)

UNIT - V

IX. Attempt the following:-

a) Melting point of NaCl is higher than $AlCl_3$. Explain.

b) How many pentagonal and hexagonal faces are there in C_{70} fullerene?

c) Bleaching action of SO_2 is temporary. Explain.

d) ICl_7 does not exist where as IF_7 exists. Explain.

e) Discuss the structure of Aluminum chloride.

f) Nitric oxide becomes brown when released in air. Explain. (6x1)

x-x-x