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908

Your Roll No.

B.Sc. (Hons.) / II

C

CHEMISTRY – Paper VII

(Inorganic Chemistry – II)

Time 3 hours

Maximum Marks: 38

*Write your Roll No on the top immediately
on receipt of this question paper.*

*Attempt six questions in all.
Question No. 1 is compulsory.*

1. Giving reason explain any **four** of the following :
 - (a) P_2 molecule is stable relative to P_4 molecule.
 - (b) Lithium forms a nitride whereas the other alkali metals do not.
 - (c) Dilute solution of alkali metals in liquid ammonia are paramagnetic.
 - (d) $SiCl_4$ is easily hydrolysed but CCl_4 is not.
 - (e) BCl_3 is monomeric while $AlCl_3$ is dimeric.

P.T.O.

(f) Sb^3+ is a reducing agent but Bi^{3+} is stable. (4×2)

2. (a) Why are sulphide ores roasted prior to their reduction with carbon? (2)

(b) Explain the principle underlying Van Arkel de Boers method of refining. (2)

(c) Describe Mond's process of extraction of Nickel from its ores. (2)

3. (a) NF_3 has no donor properties but PF_3 forms many complexes with metals. (3)

(b) What happens when :

(i) Diborane reacts with excess ammonia at high temperature.

(ii) Diborane is hydrolysed. (3)

4. (a) Why is trimethylamine a stronger base than trisilylamine? (2)

(b) Write complete and balance reaction for the following :

(i) Iron is reacted with very dilute nitric acid.

(ii) Dinitrogen trioxide is reacted with perchloric acid.

(iii) Phosphorus is reacted with concentrated nitric acid (3)

(c) Which among the two solvents give brown colour with iodine C_2H_5OH or CCl_4 . (1)

5. (a) Draw the structures of any **three** of the following :

ICl_3 , $H_2P_2O_7$, H_2SO_4 , $XeF_2 \cdot 2SbF_6$ (3)

(b) Explain why the acidic nature of hydrides of group VI varies in the order :

$H_2O < H_2S < H_2Se < H_2Te$ (2)

(c) N_2O_5 is acidic in nature. Comment. (1)

6. (a) What is catenation? Why does carbon catenate extensively. (3)

(b) Why is a small amount of $NaHCO_3$ added in the iodometric estimation of $Cr_2O_7^{2-}$ ions. (2)

(c) Explain why Helium cannot form clathrate compounds. (1)

P.T.O.

7. Write short notes on **any two** of the following :

(a) Allotropes of carbon

(b) Peroxyacids of sulphur

(c) Inert Pair Effect

(3×2)