RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

SECOND YEAR [2014-17]

B.A./B.Sc. THIRD SEMESTER (July – December) 2015

Mid-Semester Examination, September 2015

Date : 15/09/2015 **CHEMISTRY (General)**

Time : 12 noon – 1 pm Paper : III Full Marks : 25

[Answer <u>five questions</u> taking minimum <u>two questions</u> from each group]

Group – A

1. a) In group VA nitrogen is only gaseous element but other members are solid. Explain. [2·5]
   b) Why is nitrogen (N_2) behaves like an inert gas but phosphorous (white) is very active? Explain. [2·5]

2. a) The inert pair effect is maximum in bismuth. Comment and explain with giving an equation. [3]
   b) What happens when sodium bismuthate is added to a nitric acid solution of manganous salt? (with equations) [2]

3. a) Arrange and explain the reducing properties of the hydrides of VA. [3]
   b) Why is the transparent solution of stannous chloride turns turbidity on adding water? [2]

4. a) Explain the hydrolytic behaviour of CCl_4 and $SiCl_4$ with conditions and equations. [2·5]
   b) $PbCl_2$ is solid but $PbCl_4$ is liquid. Explain. [2·5]

Group – B

5. a) Give a comparative account of the elements boron, aluminium, gallium, indium and thalium with reference to their oxidation states, hydrides. [2+2]
   b) All synthesis of BH_3 results formation of B_2H_6, explain. [1]

6. a) Give the structure and bonding of B_2H_6. [3]
   b) What happens, when B_2H_6 treated with (i) NH_3 (ii) PH_3 [2]

7. a) What are pseudo-halogens and why are they so called? [2+2]
   b) Conductivity of BrF_3 increases by addition of NOF, comment. [1]

8. a) How can you prepare $KH(IO_3)_2$? Determine the acidimetric and oxidimetric equivalent weight of $KH(IO_3)_2$? [1+1+1]
   b) Solubility of I_2 in H_2O increases by addition of excess KI, comment. [2]

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