RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

FIRST YEAR [BATCH 2018-21] B.A./B.Sc. SECOND SEMESTER (January – June) 2019 Mid-Semester Examination, March 2019

Date Time	? : 2 ? : 1	26/03/2019CHEMISTRY (General)L1 am - 12 noonPaper : IIFull Ma	rks : 25
Answer <u>any five</u> questions : [5×5]			
1.	a) b)	Draw the qualitative molecule orbital diagram of N_2 molecule. Calculate its bond order. What do you mean by ionic product of water?	[3+1] [1]
2.	a)	From the band theory explain what is an n-type semiconductor?	[2]
	b)	With rough sketches show the formation of σ , π , π^* orbitals by overlap of appropriate p orbitals.	[3]
3.	a) b)	What is the concentration of H ⁺ ion in a solution of pH 5? Identify the acid and base according to Lux-Flood concept in the following reaction. $3 \operatorname{SiO}_2 + \operatorname{Al}_2 \operatorname{O}_3 \rightarrow \operatorname{Al}_2 (\operatorname{SiO}_3)_3$	[2] [1]
	c)	Arrange the followings molecules according to their Lewis acid strength: $(CH_3)_3 N, (CH_3)_2 O, CH_3 F$	[2]
4.	a) b)	Write all possible products (both substitution and elimination) when an alcoholic solution bromoethane is treated with aquous KOH. Between $(CH_3)_3CBr$ and Ch3Br one prefers S_N^{-1} pathway and the other S_N^{-2} ; which one which and why?	of 1? +(1+2)]
5.	a)	Using VSEPR theory, write the possible structures of CIF_3 and predict the most favoure structure with reason.	ed [2]
	b)	Show the limiting radius ratio of a planer trigonal lattice is 0.155.	[3]
6.	a)	Explain the thermal stability of group-II metal carbonate.	[2]
	b)	Using VSEPR theory, comment on the shape of BrF_4^- and I_3^- .	[3]
7.	a)	Compare the C=0 bond distance in CH ₃ COCH ₃ and CH ₃ CO ₂ H	[2]
	b)	Which of the following molecules has higher dipole moment and why.	[2]
	c)	Write R/S configuration for	[1]
		H ₂ N	

[2]

b) Compare the bond length a and a' for the following molecules and justify your answer.



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