Reg. No: Name	•••••						
BSc DEGREE END SEMESTER EXAMINATION, MARCH	2016						
(2015 admission)							
SEMESTER -2: CHEMISTRY							
COURSE: 15U2CRCHE2 - THEORETICAL AND INORGANIC CHEM	IISTRY II						
Time: Three Hours Maximum M	arks: 60						
Section A							
Answer all questions, each question carries 1 mark							
1. Among halogens, the element having highest electron affinity is							
2. A molecule which possess triagonal planar shape is							
3. The most polar molecule among HI, HCl, HBr and HF is							
4. The molecule having lowest bond length among N_2 , O_2 , and F_2 is							
5. In an insulator, the band is completely filled.							
6. If emits 8 alpha particles and 6 beta particles the product formed will	be						
7. If 2 g of a radioisotope decays to 1g in 7 days, 1g of the sample will become 0).25g						
indays							
8. In inorganic qualitative analysis, the cations of analytical group III are precipit	tated as						
their (1	x 8 = 8)						
Section B							
Answer any six questions, each question carries 2 marks							
9. Distinguish between the terms 'atomic radius' and 'covalent radius.'							
10. Give the 4 major conditions that favour ionic bond formation.							
11. Write down the Born-Lande equation for calculating the lattice energy per moionic crystal?	le of an						
12. Explain 'metallic lusture' on the basis of free electron theory.							
13. Differentiate between 'bonding' and 'antibonding' molecular orbitals.							
14. Explain the term 'radioactive equilibrium.'							
15. Explain packing fraction.							
16. Define 'R _f value'. How is it useful in identification of a compound?							
(2 x	x 6 = 12)						
Section C							

17. I	Discuss the	applications o	of solubility pro	duct in the sep	paration of ca	tions into	
	analytical g	roups.					
18. I	Based on M	O theory pred	ict which of the	e following ar	e paramagnet	ic	
	a) He ₂ ⁺	b) NO	c) NO ⁺	d) N_2^+	e) B ₂ ⁺	f) B ₂	
19. I	Oraw the res	sonance struct	cures of borate,	carbonate and	l nitrate ions.	Compare their	
	bond energ	y.					
20. I	Differentiate	e 'intermolecu	ılar hydrogen b	onding' and 'i	intramolecula	r hydrogen	
bonding' with illustrative examples. Explain the effect of hydrogen bonding on							
physical properties of compounds.							
21.	State the Sl	later rules for	calculating the	shielding con	stant. How is	the effective	
	nuclear cha	arge related to	screening cons	stant?			
22. I	Explain the	basic principl	e of TLC? Wha	at are the adva	ntages and di	sadvantages of	
	TLC?					$(5 \times 4 = 20)$	
Section D							
Answer any two questions, each question carries 10 marks.							
23. Predict the shape and bond angles of the following molecule based on VSEPR							
	theory.						
	a) SF ₄	b) ClF ₃	c) XeF ₂	d) IF ₅	e) Xe F ₄		
24.	Briefly exp	olain the follo	wing intermole	cular forces			
a) Vanderwaals forces b) Io			b) Ion - di _l	o) Ion - dipole interactions			
	c) dipole - dipole interactions d) ion-induced dipole interaction		nteractions				
	e) dipole -	induced dipo	le interactions.				
25.	a) State an	nd explain Faj	an's rules				
	b) Explain	the valance b	oond theory and	d Band theory	of metallic b	onding.	
26.	26. Give the various steps involved in the gravimetric estimation of barium as barium						
	sulphate.					$(10 \times 2 = 20)$	
