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## SESSION ENDING EXAMINATION, 2014-15 SUBJECT - CHEMISTRY

CLASS - XI

Time: 3:00 Hrs. M.M. 70 MARKS

## GENERAL INSTRUCTIONS : " IN TO THE ROLL of PROPERTY OF THE PRO

- 1. All questions are compulsory.
- Question no. 1 to 5 are very short answer questions and 2. carry 1 mark each.
- Question no. 6 to 10 are short answer questions and 3. carry 2 marks each.
- Question no. 11 to 22 are short answer questions and 4. carry 3 marks each.
- 5. Question no. 23 is value based question and carry 4 marks.
- Question no. 24 to 26 are long answer type questions and carry 5 marks each.
- Use log table if necessary, use of calculator is not allowed.

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: Wha	at do you un	derstand by	y "Limiting	reagent".	of Haista I	(1)
2: Stat	e Hiesenberg	Uncertaint	y Principle		1	(1)
		nder waal's	constants	a and b	are as give	en for
Gas	ses	a (Atm L <sup>2</sup>	mol <sup>-2</sup> )	b (L mol	<sup>-1</sup> )	
CO	enzana III. r	3.6		0.043	4	
SO	2	6.7		0.056		
						argest (1)
com	pound, the b	olue colour a	ap <mark>pea</mark> rs <mark>du</mark>	e to the for	mation of .	(1)
					V 115000	
; (i)	How many	subshells a	are associa	ated with n	=4 ?	
(ii)			THE RESERVE	ent in the	subshells h	aving (1+1)
: (i)	Define elect	tron gain e	nthalpy .			
—(ii)						gative (1+1)
: (i)_						found
(ii)	Why first oxygen?	ionization	enthalpy o	of nitrogen		than (1+1)
: Whi	ch out of NH	and NF <sub>3</sub>	has higher	dipole mor	ment and v	vhy ? (2)
	1				[	P.T.O.]
	2: State 3: The two Gas CO SO Out mag In com (ii) (ii) : (i) : (ii) : (iii)	2: State Hiesenberg 3: The value of Solution of these two magnitude of interest of the Solution of these two magnitude of interest of the Solution of the Solution of the Solution of the Solution of Solution	2: State Hiesenberg Uncertaint 3: The value of Vander waal's two gases:  Gases a (Atm L² CO₂ 3.6 SO₂ 6.7  Out of these two gases whi magnitude of intermolecular compound, the blue colour accompound, the blue colour accompound, the blue colour accompound, the blue colour accompound, the blue colour accompound is:  (i) How many subshells accompositive. Under what condition is:  (ii) How many electrons we ms value of -1/2 for not colour accompound is:  (ii) Define electron gain eccition in the language of th	2: State Hiesenberg Uncertainty Principles 3: The value of Vander waal's constants two gases:  Gases a (Atm L² mol²)  CO₂ 3.6  SO₂ 6.7  Out of these two gases which gas more magnitude of intermolecular forces of the compound and the blue colour appears due to colo	2: State Hiesenberg Uncertainty Principle. 3: The value of Vander waal's constants a and b a two gases:  Gases a (Atm L² mol²) b (L mol CO₂ 3.6 0.043  SO₂ 6.7 0.056  Out of these two gases which gas molecules will magnitude of intermolecular forces of attraction of intermolecular forces of	R: The value of Vander waal's constants a and b are as given two gases:  Gases a (Atm L² mol²) b (L mol¹) CO₂ 3.6 0.043  SO₂ 6.7 0.056  Out of these two gases which gas molecules will possess la magnitude of intermolecular forces of attraction?  In Lassaigne's test for detection of nitrogen in an or compound, the blue colour appears due to the formation of .  For a reaction both enthalpy change and entropy change positive. Under what conditions the reaction will be spontaned.  (i) How many subshells are associated with n=4?  (ii) How many electrons will be present in the subshells hims value of -1/2 for n=4?  (ii) Define electron gain enthalpy.  (iii) Why is the electron gain enthalpy of chlorine more negative than fluorine?  (iv) In what group of the periodic table the element will having electronic configuration: [Xe] 4f¹⁴ 5d⁴ 6s²  (iv) Why first ionization enthalpy of nitrogen is more oxygen?  Which out of NH₃ and NF₃ has higher dipole moment and we have two gases.



## OR

Draw the molecular orbital diagram of dioxygen and calculate bond order. (2)

- Q.10:(i) Draw the structure of diborane .
  - (ii) PbCl<sub>4</sub> is less stable than SnCl<sub>4</sub> but PbCl<sub>2</sub> is more stable than SnCl<sub>2</sub>. Why? (1+1)
- Q.11:(i) CO<sub>2</sub> is a gas while SiO<sub>2</sub> is solid at room temperature. Why?
  - (ii) SiCl<sub>4</sub> can be easily hydrolysed but CCl<sub>4</sub> does not hydrolysed. Why ?
  - (iii) Silicon shows a higher covalency than carbon. Why?
    (1+1+1)
- Q.12: An electron beam is accelerated by a potential difference of 10000 volts. What is the wavelength of the wave associated with the electron beam?

(mass of electron =  $9.1 \times 10^{-31} \text{ Kg}$ ,

Charge of electron=1.6 X 10<sup>-19</sup>C)

## OR

Calculate the uncertainty in the velocity of a cricket ball of mass 150 g, if the uncertainty in its position is of the order of  $1A^0$ . (1) (2)

- Q.13:(i) Draw the orbital structure of ethane .
  - (ii) Out of H<sub>2</sub>O and H<sub>2</sub>S which have high boiling point and why?
    - (iii) He<sub>2</sub> molecule does not exists. why? (1+1+1)
- Q.14:(i) Define " Charles law ". (1)
  - (ii) Calculate the temperature of 4 mol of gas occupying 5 dm<sup>3</sup>



at 3.32 bar pressure.

$$(R = 0.083 \text{ bar dm}^3 /\text{mol/k})$$
 (2)

- Q.15: Define the following terms :
  - (i) Hess's law
  - (ii) Standard enthalpy of atomization
  - (1+1+1)(iii) Entropy

Q.16: For the reaction:

$$N_2$$
 (g) + 3  $H_2$  (g)  $\longrightarrow$  2  $NH_3$  (g)  
 $AH = -95.4 \text{ kj}$ ;  $AS = -198.3 \text{ j/k}$ 

Calculate the temperature at which Gibb's free energy change is equal to zero. Predict the nature of the reaction at this temp. and above it .

Q.17:(i) Given the standard electrode potentials: 10 and in 2008

$$K^+/K = -2.93 \text{ V}$$
,  $Ag^+/Ag = +0.80 \text{ V}$ ,  $Cr^{+3}/Cr = -0.74 \text{ V}$   
Out of these electrode which will be the strongest reducing agent?

Represent the Galvanic cell in which the reaction takes (ii) place:

$$\overline{Zn(s)}$$
 + 2 Ag<sup>+</sup>(aq)  $\longrightarrow$  Zn<sup>+2</sup> (aq) + 2 Ag (s)

- Which of the electrode is negatively charged ? (a)
- What are the carriers of the current in the cell? (b)
- Q.18: Chlorophyll, the green colouring material of plants contains 2.68 % of magnesium by mass. Calculate the number of moles of magnesium and atoms in 5.00 g of this complex. (Atomic mass of Mg=24) (2)

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- (i) Write the name and formula of the liquid substance.
- (ii) Why this compound is stored in dark coloured bottles?
- (iii) How is the strength of the substance generally expressed ?
- (iv) What values are associated with the chemistry teacher ? (1+1+1+1)
- Q.24(i) State Le-chateliers principle. (1)
  - (ii) Write conjugate base for the acids :

$$HCO_3^-$$
,  $H_2SO_4$ .

- (iii) What is the difference between solubility product and ionic product ?
- (iv) Calculate the PH of of a solution having [ H<sub>3</sub>O<sup>+</sup>] of 10<sup>-3</sup>. (2)

OR

- (i) State " Common ion effect ". (1)
- (ii) For a hypothecal reaction:

 $2 A + B \Leftrightarrow C + D$ ;  $\Delta H = -x \text{ kj/mol}$ 

What will be the effect on the equilibrium with

- (a) Decrease of temperature
- (b) addition of Helium gas (1+1)
- (iii) At 700 K , the equilibrium constant Kp , for the reaction  $2 SO_2(g) \Leftrightarrow 2 SO_3(g) + O_2(g)$

is 1.8 X 10<sup>-3</sup> k Pa. What is the numerical value in moles per litre of Kc for this reaction at this temperature? (2)

Q.25:(a)	Account for the followings: (1+1+	1)
(i)	Be and Mg do not give flame colouration .	
(ii)	Li is the strongest reducing agent.	
(iii)	Potassium carbonate can not be prepared by Solvay proce	ss
(b)	In what ways Li shows similarities to Mg in its chemic behavior. (any two)	cal 2)
	rerigin one sometien ORetroog unfind anti-yell/ (b)	
(a)	Write three properties of Lithium which differ from the rest the members of group 1.	of
(b)	Arrange the following in order of the property mentioned	:
. 1	Mg(OH) <sub>2</sub> , Sr(OH) <sub>2</sub> , Ba(OH) <sub>2</sub> , Ca(OH) <sub>2</sub> :	
	increasing basic character	
(c)	Complete the reaction :	
	$Pb(NO_3)_2 \xrightarrow{heat}                                    $	1)
Q.2 <mark>6:(a)</mark>	Explain the following reactions:	

- (i) Wurtz reaction
- (ii) Friedel crafts alkylation

(1+1)

- Convert: (b)
  - 1-bromopropane to propene (i)
  - Sodium acetate to methane (ii) (1+1)
- (c) Melting point of cis-2-butene is lower than that of trans-2butene. why ? (1)

OR



- (a) Propanal and pentan-3-one are the products of reductive ozonolysis. What is the structure of the alkene? (1)
- (b) Explain Huckel's Rule. (1)
- (c) Convert
  - (i) Benzene to nitrobenzene
  - (ii) Ethyne to ethanal (1+1)
- (d) Why the boiling points of n-alkanes are higher than their branched chain isomers? (1)