FIRST TERM EXAMINATION (07 SEPT 2015)
Paper - CHEMISTRY
Class – XI
(SET – A)

Time: 3hrs.   MM: 70

General Instructions:

i) **All questions are compulsory.**

ii) **Question number 1 to 6 are very short answer questions and carry 1 mark each.**

iii) **Question number 7 to 12 are short answer questions and carry 2 marks each.**

iv) **Question number 13 to 22 are also short answer questions and carry 3 marks each.**

v) **Question number 23 is of 4 marks.**

vi) **Question number 24 to 26 are long answer questions and carry 5 marks each.**

vii) **Use log tables if necessary, use of calculators is not allowed.**

Q1. Which is the smallest among Na^+, Mg^{+2}, Al^{+3} and why?

Q2. Write vander waal equation for 'n' moles of real gas.

Q3. Why does Mg forms Mg^{+2} ions only.

Q4. Which gas law is shown by following graph. Write the statement of the law.

Q5. State law of constant composition with example.

Q6. Why do BeF_2 and BF_3 have zero dipole Moment?

Q7. Give Reasons

i) An Anion is always bigger than its parent atom

ii) Chlorine (Cl) has more negative election gain enthalpy than Fluorine (F)

Q8. What will be the minimum pressure required to compress $500dm^3$ of air at 1 bar to $200dm^3$ at 30^0C.

Q9. What are the No. of unpaired electrons in:

i) Fe^{+2} $(Z = 26)$ ii) Cu^{+1} $(Z = 29)$

Q10. (i) Why are alkali metals used in photoelectric cells

(ii) What happens when K burns in air? Write equation.

Q11. Calculate Molarity of NaoH in the solution prepared by dissolving its 4gm in enough water to form 250ml of the solution (M.M Na = 23, O=16, H = 1)

Q12. Yellow light emitted from sodium lamp has Wavelength (λ) of 580nm, calculate frequency (v) and wave member $\bar{v}$ of yellow light.

Q13. Predict the shape, geometry of following molecules by VSEPR theory

(i) CH_4 (ii) H_2O :

Q14. Define the following:

a) Boyle's temperature b) Ideal gas

What is the affect of temperature on surface tension?

Q15. Draw Lewis dot structure of CO_3^{-2} Ion and find the formal charge on each atom.

Q16. (i) What is photoelectric affect?

(ii) In building up of atoms the filling of 4S orbital occurs before 3d orbitals.

(iii) What is the total no. of electrons possible with $n = 4$ $ms = -\dfrac{1}{2}$.

Q17. Assign the position of elements in terms of group, period & block of Modern Periodic Table.

A = 20 B = 13

Q18. (i) What is the no. of significant figures in mass of electron?

(ii) Determine the molecular formula of an oxide of iron in which mass percent of iron and oxygen are 69.9 and 30.1 respectively.

M. M Fe = 56 O = 16

Q19. Complete the following chemical equations:

i) $Na_2O_2 + H_2O \rightarrow$

ii) $BeCl_2 + LiAlH_4 \rightarrow$

iii) Cl_2 (g) reacts with slaked lime $\rightarrow$

Q20. Calculate the bond order of O_2 and O_2^+ which one is more stable & why.

Q21. a) Calculate the volume occupied by 4.0 mole of gas occupying 5dm^3 at 3.32 bar. (R= 0.082 bar dm^3 K^{-1} mol^{-1})

b) If vander waal constant 'a' is zero for a gas, can the gas be liquefied? Give reason.

Q22. a) Calculate the wave number of longest transition of an electron in Balmer Series.

b) How many sub shells are associated with n = 4.

Q23.   Pressure is defined as the force per unit area. Pressure is inversely proportional to area. The greater the area, lesser will be the pressure and vice versa – we observe many things in our daily life like sharp glass edges, sharp knife, broad handle of bags etc. Mrs. Jacob uses jute bags for carrying vegetables, milk etc. with broad strap instead of plastic bags.

1. Why do we use sharp edge knife for cutting vegetables.

2. Can you tell why are the handles of the bag made broad with more surface area.

3. What value is possessed by Mrs. Jacob.

4. What is the SI unit of pressure.

Q24. (i) Define H-Bonding? Mention its types.

(ii) Using the concept of Hybridisation and draw orbital diagram to explain the structure of

C_2H_4 Molecule.

OR

i)   Draw the Lewis dot structure of No_2^{-1} and also find the formal charge on each atom.

ii)   Draw the Resonace structure of O_3 molecule.

Q25.   a) Using S, P, d notations describe, the orbitals with the following quantum nos.

i) $n = 4 \quad l = 2$ ii) $n = 3 \quad l = 0$

b)   Find the energy of the photons with:

i) corresponds to light of wavelength of $0.50A^0$.

ii) and frequency of $3 \times 10^{15} Hz_2$

OR

a) State Hunds Rule with example.

b) What will be wavelength of a ball of mass 0.1kg moving with a velocity of $10ms^{-1}$

($h=6.62 \times 10^{-34}$ kgm^2 s^{-1})

Q26.   i) Describe solvays process for preparation of Na_2Co_3 with the help of chemical equation.

ii) Why do alkali metals not occur in free state?

OR

a) Define diagonal relationship. What is its cause? Explain how Lithium resembles Magnesium diagonally.

b) Lil is more soluble than KI in ethanol.