FIRST TERM EXAMINATION (14 SEPT 2017)

Paper - CHEMISTRY

Class – XI

(SET – B)

Time: 3hrs. **MM: 70**

General Instructions:

- **i) All questions are compulsory.**
- **ii) Question number 1 to 5 carry 1 mark each.**
- **iii) Question number 6 to 10 carry 2 marks each.**
- **iv) Question number 11 to 22 carry 3 marks each.**
- **v) Question number 23 is of 4 marks.**
- **vi) Question number 24 to 26 carry 5 marks each.**
- **vii) Use log tables if necessary, use of calculators is not allowed.**

Q1. Calculate the number of atoms in 52g of He (atomic mass of He = 4gm)

Q2. State Hund's rule of maximum multiplicity.

Q3. What would be the IUPAC name and symbol of element with atomic number 114?

Q4. Draw lewis dot structure of CO_3^{2-}

Q5. Define critical temperature.

Q6. What is the basic deference between electron gain enthalpy & electro negativity?

Q7. Discuss the shape of BCl_3 molecule using VSEPR theory.

Q8. State Charles law. Give its significance.

Q9. Justify the following reaction is a redox reaction

$4NH_3 + 5O_2 \longrightarrow 4NO + 6H_2O$

Q10. Beryllium and Magnesium donot give colour to flame whereas other alkaline earth metals do so. Why?

Q11. What is the concentration of sugar ($C_{12}H_{22}O_{11}$) in mole Lt^{-1} if its 20gm are dissolved in enough water to make a final volume up to 2L?

Q12. A compound contains 4.07% hydrogen, 24.27% carbon and 71.65% chlorine. Its molar mass is 98.96gm. What are its empirical and molecular formula. (At mass C=12 H=1, Cl=35.5)

Q13. Write electronic configuration of element with atomic number

(i) 19 (ii) 17 (iii) 25

Q14. Electrons are emitted with zero velocity from a metal surface when it is exposed to wavelength $6800A^0$. Calculate threshold and work function of metal.

Q15. An electron is present in 4f orbital. Write its value of n, l , m, s

Q16. a) Write general electronic configuration of S & P block element.

b) How atomic radii varies in a group & in period?

Q17. Assign the position of element having outer electronic configurations

i) $ns^2\ np^3$ for n = 3

ii) $(n-1)\ d^2\ ns^2$ n = 4

Q18. Define H-bonding. Mention its types with example.

Q19. A vessel of 120ml capacity contains a certain amount of gas at 35^0C and 1.2bar pressure. The gas is transferred to another vessel of volume 180ml at 35^0C. What would be its pressure?

Q20. a) Calculate oxidation number to the underlined element (i) $H_2\ \underline{S_2}\ O_7$ (ii) $K\underline{Mn}O_4$

b) Define disproportionation reaction

Q21. Balance the following reaction by oxidation no method

$MnO_4^{\Theta} + SO_2 \rightarrow Mn^{2+} + HSO_4^{\Theta}$ $(in\ acidic\ medium)$

OR

Balance following equation by Ion e^{Θ} method

$N_2H_4 + C10_3^{\Theta} \rightarrow NO + Cl^{\Theta}$ $(in\ basic\ medium)$

Q22. Write balanced equation for reactions between

a) $Na_2\ O_2$ and water

b) Ko_2 and water

c) Na_2O and Co_2

Q23. Penicillin, an important antibacterial agent was discovered by Alexender in 1928. It has the formula C14 H20 N2 SO4. It saved millions of lives of world.

i) How is penicillin important for life?

ii) What is the molecule mass of the compound?

iii) Give mass of one molecule of penicillin in guanos?

iv) Calculate mass percentage of nitrogen in this compound?

Q24. i) Explain the orbital diagram of Ethyne (C2H2) Molecule.

ii) Write the resonance structure of NO2 and SO3 molecules.

OR

i) Why Be_2 molecule does not exists?

ii) Out of NH_3 and NF_3 which has higher dipole moment and why?

iii) Define Hybridisation

Q25. a) Using ideal gas equation show that density of gas is proportional to gas pressure P.

b) Define: (i) Boyle point b) Compressibility factor

OR

a) Calculate the total pressure in a mixture of 8g of dioxygen and 4gm of dihydrogen confined in a vessel of 1dm^3 at 270C (R = 0.083 bar dm^3/K/md)

b) Under what conditions do real gases behaves like ideal gas.

Q26. a) In what ways Lithium differ from rest of family members.

b) Potassium carbonate cannot be prepared by Solvays process why?

c) Why is KO_2 paramagnetic?

OR

a) Draw the structure of $BeCl_2$ in solid and in vapour state

b) Why alkali metals give blue colour solution with liquid ammonia?

c) Why Lithium carbonate decomposed at temperature whereas Na_2CO_3 at higher temperature?