

# 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 difference 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 do not 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  $L^{-1}$  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  $6800\text{\AA}$ . 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

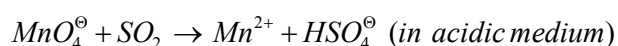
- i)  $ns^2 np^3$  for  $n = 3$
- ii)  $(n-1) d^2 ns^2 n = 4$

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

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

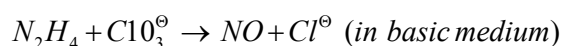
- Q20. a) Calculate oxidation number to the underlined element (i)  $\text{H}_2 \underline{\text{S}}_2 \text{O}_7$  (ii)  $\text{K} \underline{\text{Mn}} \text{O}_4$   
b) Define disproportionation reaction

Q21. Balance the following reaction by oxidation no method



OR

Balance following equation by Ion  $e^\ominus$  method



Q22. Write balanced equation for reactions between

- a)  $\text{Na}_2 \text{O}_2$  and water
- b)  $\text{KO}_2$  and water
- c)  $\text{Na}_2\text{O}$  and  $\text{CO}_2$

Q23. Penicillin, an important antibacterial agent was discovered by Alexander in 1928. It has the formula  $\text{C}_{14} \text{H}_{20} \text{N}_2 \text{SO}_4$ . 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 grams?
- iv) Calculate mass percentage of nitrogen in this compound?

- Q24. i) Explain the orbital diagram of Ethyne ( $\text{C}_2\text{H}_2$ ) Molecule.  
ii) Write the resonance structure of  $\text{NO}_2$  and  $\text{SO}_3$  molecules.

OR

- i) Why  $\text{Be}_2$  molecule does not exist?
- ii) Out of  $\text{NH}_3$  and  $\text{NF}_3$  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  $1\text{dm}^3$  at  $270\text{C}$  ( $R = 0.083 \text{ bar dm}^3/\text{K/md}$ )  
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  $\text{KO}_2$  paramagnetic?

**OR**

- a) Draw the structure of  $\text{BeCl}_2$  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  $\text{Na}_2\text{CO}_3$  at higher temperature?