

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\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°C and 1.2bar pressure. The gas is transferred to another vessel of volume 180ml at 35°C . What would be its pressure?

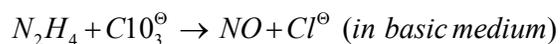
- Q20. a) Calculate oxidation number to the underlined element (i) $\text{H}_2 \underline{\text{S}}_2 \text{O}_7$ (ii) $\text{K} \underline{\text{Mn}} \text{O}_4$
b) Define disproportionation reaction

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) KO_2 and water
- c) Na_2O and 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 (C_2H_2) Molecule.
ii) Write the resonance structure of NO_2 and SO_3 molecules.

OR

- i) Why Be_2 molecule does not exist?
- 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 ($R = 0.083\text{ bar dm}^3/\text{K/md}$)
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 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?