

FIRST TERM EXAMINATION (16 SEPT 2015)

Paper - CHEMISTRY

Class – XII

(SET – B)

Time: 3hrs.

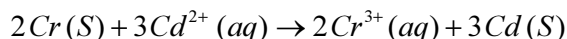
MM: 70

General Instruction:

- i) Ques. 1 – 5 carry 1 mark each.
- ii) Ques. 6 – 10 carry 2 marks each
- iii) Ques. 11 – 22 carry 3 marks each
- iv) Ques. 23 carry four marks.
- v) Ques. 24-26 carry 5 marks each

All Questions are compulsory:

- Q1. Name a compound which shows both types of defects in solids.
- Q2. State the main advantage of molality over molarity as the unit of concentration.
- Q3. What are the advantages of fuel cell over ordinary cell?
- Q4. Distinguish between adsorption and absorption.
- Q5. What is a copolymer?
- Q6. Calculate the packing efficiency in case of body centred cubic lattice.
- Q7. The conversion of the molecules X to Y follows second order kinetics. If the concentration of X is increased to three times, how will it affect the rate of formation of Y?
- Q8. Calculate the e.m.f. of the cell in which the following reaction takes place



(Given $E^0 Cr^{3+} / Cr = -0.74V$, $E^0 Cd^{2+} / Cd = -0.40V$)

- Q9. Write the structures of following compounds
- (i) 2 – Chloro 3- methylpentane (ii) 1, 4 dibromobut – 2 - ene
- Q10. Arrange the compounds of each set in order of reactivity towards SN^2 displacement;
- (i) CH_3Br OR CH_3I
- Q11. An element has a body centered cubic (bcc) structure with cell edge of 288 pm. The density of the element is 7.2gcm^{-3} . How many atoms are present in 208g of the element?
- Q12. Explain giving suitable examples
- a) Frenkel defect
 - b) Ferromagnetism
 - c) Insulators
- Q13. The boiling point of benzene is 353.23k. When 1.80g of a non-volatile solute was dissolved in 90g of benzene, the boiling point is raised to 354.11k. Calculate the molar mass of the solute. (K_b for benzene = $2.53\text{ k kg mol}^{-1}$)

Q14. Explain what is observed when

- an electrolyte, NaCl is added to ferric hydroxide sol.
- when a beam of light is passed through colloidal solution.
- electric current is passed through colloidal solution.

Q15. Give reasons:

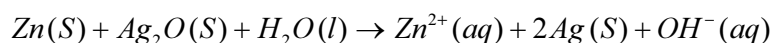
- H_3PO_3 is diprotic (or dibasic)
- N does not form pentahalides while phosphorus does.
- F_2 is a powerful oxidizing agent

Q16. Complete the reactions:

- $C_2H_4 + O_2 \rightarrow$
- $P_4 + NaOH + H_2O \rightarrow$
- $XeF_6 + H_2O \rightarrow$

Q17. What are ideal and non-ideal solutions? Discuss positive and negative deviation from ideal behaviour for liquid pairs.

Q18. In button cell used in watches, the following reaction takes place:



Determine: E^0 and ΔG^0 for the reaction

Given: $E^0 Zn^{2+} / Zn = 0.76V$, $E^0 Ag^+ / Ag = 0.34V$

Q19. What is the difference between primary and secondary battery? Write reactions of Lead Storage battery at anode and cathode while recharging.

Q20. The rate of a particular reaction doubles when temperature changes from 27^0C to 37^0C . Calculate the energy of activation of such a reaction.

Q21. Give reasons:

- Grignard reagents should be prepared under anhydrous conditions.
- Alkyl halides, though polar, are immiscible with water.
- The dipole moment of chlorobenzene is lower than that of cyclohexyl chloride.

Q22. Define:

- Addition polymerization.
- Condensation polymerisation.
- Thermosetting polymers.

Q23. Every year as winter sets in, we find smog in the sky. As a result, visibility is very poor. Lots of accidents are reported in different parts of the country and there is loss of valuable lives.

- What is smog?
- How is it caused?
- What harmful effects does it have on our body.
- Suggest some ways to check smog.

Q24. (i) What are Azeotropes? What are its types?

ii) Vapour pressure of pure water at 298K is 23.8mm Hg. 50g of urea (NH_2CONH_2) is dissolved in 850 g of water. Calculate the vapour pressure of water for this solution and its relative lowering.

OR

- a) What is Van't Hoff factor? What possible value can it have if solute undergoes dissociation in solution?
- b) Determine the osmotic pressure of a solution prepared by dissolving 25mg of K_2SO_4 in 2L of water $25^\circ C$, assuming that it is completely dissociated.

Q25.a) Differentiate between order and molecularity.

b) A first order reaction takes 40min for 30% completion. Calculate $t_{1/2}$.

OR

- i) For a reaction $2A \rightarrow$ Products, the concentration of A decreases from 0.5 mol L^{-1} to 0.4 mol L^{-1} in 10 minutes. Calculate the rate during this interval.
- ii) Sucrose decomposes in acid solution into glucose and fructose according to the first order rate law with $t_{1/2} = 3 \text{ hr}$. What fraction of sample of sucrose remains after 8 hours?

Q26.i) Draw structures of

a) BrF_3

b) PCl_5

ii) Give reasons

- a) ICl is more reactive than I_2 .
- b) Oxygen is a gas but S is a solid.
- c) Bond angle in PH_3 is less than NH_3 molecule.

OR

- i) a) What is the covalence of N in N_2O_5 ?
- b) Why elements of Group 18 are called noble gases?
- ii) Give reasons:
- a) Bond dissociation energy of F_2 is less than that of Cl_2 .
- b) The majority of noble gas compounds are those of Xenon.
- c) PCl_5 is ionic in nature in the solid state.