

FIRST TERM EXAMINATION (16 SEPT 2015)

Paper - CHEMISTRY

Class – XII

(SET – A)

Time: 3hrs.

MM: 70

General Instruction:

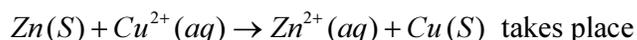
- i) Ques. 1 – 5 carry 1 mark each.
- ii) Ques. 6 – 10 carry 2 marks each
- iii) Ques. 11 – 22 carry 3 marks each
- iv) Ques. 23 carry four marks.
- v) Ques. 24-26 carry 5 marks each

All Questions are compulsory:

Q1. What type of stoichiometric defect is shown by AgCl?

Q2. Define Isotonic solution.

Q3. Represent the galvanic cell in which the reaction:



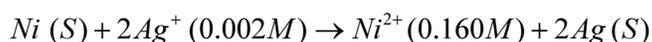
Q4. Write dispersed phase and dispersion medium in smoke colloidal system.

Q5. What are biodegradable polymers? Give one example.

Q6. An alloy of Gold and Cadmium crystallizes with a cubic structure in which gold atoms occupy the corners and cadmium atoms fit into the face centres. Assign formula for this alloy.

Q7. Show that for a First Order Reaction the time required for half the change (half life period) is independent of initial concentration.

Q8. Calculate the e.m.f. of the cell in which the following reaction takes place



$$(E^0_{cell} = 1.05V)$$

Q9. Write chemical equations for the following named reactions

- (i) Fittig reaction (ii) Gatterman reaction

Q10. Which will react faster in SN^2 displacement, 1- bromopentane or 2 – bromopentane and why?

Q11. The density of copper metal is $8.95g\ cm^{-3}$. If the radius of Cu atom is 127.8 pm, is the Cu unit cell a simple cubic, a body centered cubic or face centred cubic structure?

$$(\text{At. Mass of } Cu = 63.54g\ mol^{-1} \text{ and } N_A = 6.02 \times 10^{23}\ mol^{-1})$$

Q12. Explain giving suitable examples

- a) Shottky defect
- b) F – centres
- c) Paramagnetism

- Q13. 15g of unknown molecular material is dissolved in 450g of water. The resulting solution freezes at $-0.34^{\circ}C$. What is the molar mass of the material? (K_f for water = $1.86\text{ k kg mol}^{-1}$)
- Q14. Distinguish between multimolecular, macromolecular and associated colloids. Give one example of each.
- Q15. Give reasons:
- Why noble gases have very low boiling points?
 - Why sulphur exhibits paramagnetic behaviour in vapour state?
 - Why NO_2 readily forms a dimer?
- Q16. Arrange:
- Br_2 , I_2 , F_2 , and Cl_2 in order of increasing bond dissociation enthalpy.
 - HCl , HF , HI and HBr in order of increasing acidic character.
 - $HClO_4$, $HClO$, $HClO_2$, $HClO_3$ In order of increasing oxidizing power.
- Q17. State Raoult's law for solutions of volatile liquids. Taking suitable examples, explain the meaning of positive and negative deviations from Raoult's Law.
- Q18. The conductivity of 0.001M acetic acid is $4 \times 10^{-5} S/cm$. Calculate the dissociation constant of acetic acid, if molar conductivity at infinite dilution for acetic acid is $390 S\text{ cm}^2/mol$
- Q19. What type of a battery is a lead storage battery? Write anode and cathode reactions occurring in a lead storage battery when current is drawn from it.
- Q20. A first order reaction takes 100min for completion of 60% of the reaction. Find the time when 90% of the reaction will be completed.
- Q21. Give reasons:
- The treatment of alkyl chloride with aqueous KOH leads to the formation of alcohol but in presence of alcoholic KOH , alkene is the major product.
 - Alkyl halides, though polar are immiscible with water.
 - p-chlorobenzene has higher melting point than those of o- and m-isomers.
- Q22. Name and draw structure of monomers of following polymers
- (a) Nylon-6 (b) Polypropene (iii) Buna - S
- Q23. A house wife while working in the kitchen got a cut on the finger. It started bleeding and she became panicky. She immediately called her neighbour. Neighbour applied ferric chloride on house wife's cut and the bleeding stopped.
- What is the chemical formula of Ferric chloride?
 - Why did bleeding stop on applying it on the affected area?
 - What is the name of phenomenon involved?
 - What is the value association with it from the point of view of a chemist?

Q24. (i) A solution of glucose ($C_6H_{12}O_6$) in water is labelled as 10% by weight, what would be the molarity of the solution? (Molar mass of glucose = 180 gm/mol)

ii) Calculate the boiling point of a solution prepared by adding 15g of NaCl to 250g of water.

$$(K_b \text{ for water} = 0.512 \text{ k kg mol}^{-1} \text{ Molar Mass of NaCl} = 58.44 \text{ g mol}^{-1})$$

OR

a) State Henry's Law and mention its two important applications.

b) Determine the osmotic pressure of a solution prepared by dissolving 2.5×10^{-2} g of K_2SO_4 in 2L water at 25°C assuming that it is completely dissociated.

$$(R = 0.821 \text{ L atm K}^{-1} \text{ mol}^{-1}, \text{ Molar mass of } K_2SO_4 = 174 \text{ g / mol})$$

Q25.a) What are pseudo first order reactions? Give one example.

b) The half life for decay of radioactive ^{14}C is 5730 years. An archeological artifact containing wood had only 80% of the ^{14}C found in a living tree. Estimate the age of the sample.

OR

i) A reaction is of second order with respect to a reactant. How is its rate affected if the concentration of the reactant is

(a) doubled (b) reduced to half

ii) For a decomposition reaction, the values of rate constant k at two different temperatures are given below.

$$K_1 = 2.15 \times 10^{-8} \text{ L mol}^{-1} \text{ S}^{-1} \text{ at } 650 \text{ K}$$

$$K_2 = 2.39 \times 10^{-7} \text{ L mol}^{-1} \text{ S}^{-1} \text{ at } 700 \text{ K}$$

Calculate the value of activation energy for this reaction. ($R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$)

Q26.i) What happens when

a) PCl_5 is heated

b) H_3PO_3 is heated. (write reactions)

ii) Draw structures

a) XeF_2 b) $H_2S_2O_7$ c) ClF_3

OR

i) Name two poisonous gases prepared from chlorine.

ii) Complete the equation:

