INDIAN SCHOOL SOHAR
SECOND TERM EXAM 2015-2016
CHEMISTRY

STD: XII MARKS: 70
Date:1-12-2015 TIME: 3 Hrs

Instructions:

1. *All questions are compulsory.*
2. *Question nos. 1-5 are very short answer questions and carry 1 mark each.*
3. *Question nos. 6-10 are short answer questions and carry 2 marks each.*
4. *Question nos 11-22 are short answer questions and carry 3 marks each.*
5. *Question no. 23 is value based question and carry 4marks.*
6. *Question nos. 24-26 are long answer questions and carry 5 marks each.*
7. *Write serial no. of the question before attempting it.*
8. *Use log tables for calculations.*

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1. What is forbidden zone?
2. Write the zwitter ion of amino acid.
3. Write the IUPAC name of the given compound: CH_3-CH(Cl)-CH=CH-CH(OH)-CH_3
4. Which of the following is most effective electrolyte in the coagulation of Fe(OH)3 sol?
   $AlCl_3$, K_3PO_4, $K_4[Fe(CN)_6]$, $MgCl_2$
5. Why does molar conductivity increase steeply at infinite dilution for a weak electrolyte?
6. Explain what happens when germanium is doped with the following :
   a) group 15 element b) group 13 element.

   OR

   Differentiate between Schottky defect and Frenkel defect.
7. Calculate the osmotic pressure of decimolar solution of NaCl which is ionized to 80% at 27^{o}c.
   (R = 0.0821 L-atm K^{-1} mol^{-1})
8. Illustrate the following with an example:
   a) Hoffmann Bromamide reaction b) Carbylamine reaction.
9. a) What is meant by shape selective catalysis? Give an example.
   b) Explain the formation of delta at the point where river water meets sea water.
10. Explain why?
    a) Stability of oxoacids of chlorine increases in the order: $HClO < HClO_2 < HClO_3 < HClO_4$
    b) F_2 is most reactive of all halogens.
11. a) Classify the following as addition and condensation polymers:
    Terylene , Bakelite , polyvinyl chloride , Polythene
    b) How is Buna-S prepared?
    c) What is meant by vulcanization of rubber?

12. How will you bring about the following conversions:
    a) Propyne to acetone b) Acetyl chloride to acetone c) Acetophenone to benzoic acid

13. Explain what happens when
    a) Light is passed through a colloid
    b) Current is passed through a colloid
    c) Electrolyte $FeCl_3$ is added to $Fe(OH)_3$ sol.

14.a) Write IUPAC name of $[PtCl_2(en)_2](NO_3)_2$
    b) Predict the shape and magnetic behavior of the following complexes:
    i) $[Cr(H_2O)_6]^{3+}$ (Z = 24) ii) $[Ni(CN)_4]^{2-}$ (Z = 28)

15. Account for the following:
    a) NaCl on heating in sodium vapours show yellow colour.
    b) Crystalline solids are anisotropic in nature.
    c) Window panes of ancient buildings are thicker at the bottom.

16.a) Explain the structure of DNA.
    b) Write two functions of nucleic acid.

OR

    a) Write the reaction of glucose with i) Bromine water ii) HCN
    b) What is meant by denaturation of protein?

17. Explain the following methods for the purification of metals:
    a) Mond's process b) Zone refining c) Van Arkel method

18. Non-ideal solutions exhibit either positive or negative deviations from Raoult's law. What are these deviations and how are they caused?

19. Write Nernst equation and calculate e.m.f of the following cell at 25^oc.

    $Fe(s) \mid Fe^{2+}(0.001M) \parallel H^+(1M) \mid H_2(g) \mid Pt(s)$

20. Draw the graph for logk vs 1/T. What is the relationship between its slope and activation energy? Calculate the activation energy if its slope is -5840. ($R = 8.314\ J\ K^{-1}\ mol^{-1}$)

21.a) Why aryl halides cannot be prepared by reaction of phenol with HCl in the presence of $ZnCl_2$.
    b) What is meant by chirality of a molecule? Give an example.
    c) Diphenyls are potential threat to the environment. How are these produced from aryl halides?

22.a) What happens when benzene diazonium chloride is treated with water?
    b) How is tert-butyl alcohol obtained from acetone ?
    c) Alcohols react with active metals like Na, K to give corresponding alkoxides. Write down the decreasing order of reactivity of sodium metal towards primary, secondary and tertiary alcohols.

23. A large number of polymers are resistant to environmental degradation and therefore are responsible for pollution due to their accumulation in the environment. Polythene which we use daily as carry bags is also one such polymer.
    a) How can you as a responsible individual avoid the environmental degradation due to these polymers especially polythene?
    b) What are biodegradable polymers? How would you prepare one such polymer?

c) Classify the above biodegradable polymer as i) addition or condensation polymer
ii) homopolymer or copolymer

24a) Account for the following :

i) Halogens are coloured.

ii) In spite of nearly the same electronegativity, oxygen forms hydrogen bonding but chlorine does not.

iii) Ozone is thermodynamically unstable than oxygen.

iv) Iron dissolves in HCl to form $FeCl_2$ and not $FeCl_3$.

v) Noble gases have large radii.

OR

a) Draw the structure of the following oxoacids of sulphur:

i) Pyrosulphuric acid ii) Sulphurous acid iii) peroxodisulphuric acid

b) Complete the following ionic equations and balance:

i) $SO_2 + MnO_4^- + H_2O \longrightarrow$

ii) $Pt + H^+ + NO_3^- + Cl^- \longrightarrow$

25. a) Give chemical test to distinguish between the following pairs of compounds:

i) Benzophenone and acetophenone ii) formic acid and acetic acid

b) Complete the following sequence of reactions:

i) $CH_3CH_2CHO \xrightarrow{KMnO_4} A \xrightarrow{P + Cl_2} B \xrightarrow{aq.KOH} C$

ii) $CH_3CH_2OH \xrightarrow{Pcc} D \xrightarrow{HCN} E \xrightarrow{H_3O^+,\ \Delta} F$

OR

a) Explain, giving reactions, what happens when

i) Acetaldehyde is treated with caustic soda.

ii) Methanal reacts with NaOH.

iii) CO_2 is passed through ethyl magnesium bromide and the product is hydrolysed in acidic medium.

b) Carbonyl group undergoes nucleophilic addition reactions. Illustrate them with examples. Explain why ketones are less reactive towards nucleophilic addition reactions.

26. a) How is $KMnO_4$ obtained from pyrulosite ore? Explain giving the reactions.

b) Explain the following properties of transition metals:

i) Catalytic properties ii) Tendency to form colored ions

iii) formation of interstitial compounds.

OR

a) State reasons for the following observations:

i) The enthalpies of atomisation of transition elements are quite high.

ii) E^o for Mn^{3+}/Mn^{2+} couple is more positive than Fe^{3+}/Fe^{2+}. (Z for Mn=25, Fe=26)

iii) Cr^{2+} is reducing while Mn^{3+} is oxidizing though both have d^4 configuration.

iv) Eu^{2+} is a strong reductant while Ce^{4+} is a strong oxidant.

v) Zn, Cd and Hg are not transition elements.

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