MANAVA BHARATI
INDIA INTERNATIONAL SCHOOL

MID TERM ASSESSMENT- 2015-16
SUBJECT- CHEMISTRY
CLASS- XII

TIME 3 HOURS M.M 70

Important instructions:

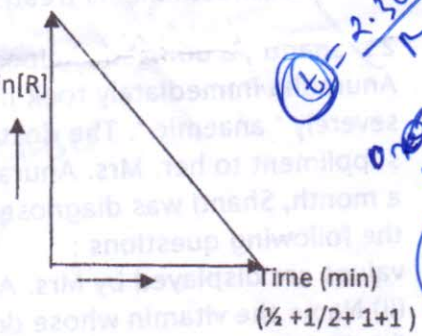
1. All questions are compulsory.
2. Q.No. 1 to 5 are very short answer type questions and carry 1 mark each.
3. Q. No. 6 to10 are short answer type questions carrying 2 marks each.
4. Q.No. 11 to22 are short answer type questions carrying 3 marks each.
5. Q.N.23 is value based question and carries 4 marks.
6. Q.No. 24 to 26 are long answer type questions carrying 5 marks each.

1. Give reason when 30 ml of ethyl alcohol and 30 ml of water are mixed, the volume of resulting solution is more than 60 ml.
2. Write the IUPAC name of CH_3-O-CH_2-CH(CH_3)-CH_2-CH_3
3. What happens when Ferrimagnetic substance is heated ?
4. Why is ortho-nitrophenol more acidic than ortho-methoxyphenol?
5. What is the effect of temperature on chemisorptions?
6. Write the mechanism of acid hydrolysis of propene.
7. The resistance of a conductivity cell containing 0.001 M KCl solution at 298 K is 1500 ohm. What is the cell constant if the conductivity of the cell is 0.146×10^{-3} S cm^{-1} ?
8. Write a non exothermic reaction taking place in the blast furnace during the extraction of iron .
9. Determine the type of cubic lattice to which a given crystal belongs if it has edge length of 290 pm and density is 7.80 g/cm^3 (molecular mass = 56 g/mol)
10. Sucrose decomposes in acid solution into glucose and fructose according to the first order rate law with $t_{1/2}$ = 3 hours. Calculate the fraction of sucrose which remains after 8 hours.

OR

The thermal decomposition of HCOOH is a first order reaction with a rate constant of 2.4×10^{-3}. Calculate how long will it take for 3/4th of initial quantity to decompose ?

11. For a chemical reaction variation in concentration, ln [R] vs time (min) plot is shown alongside:
    (a) What is the order of reaction ?
    (b) What are the units of rate constant, k ?
    (c) If initial concentration of the reactant is half of the Original concentration, how will $t_{1/2}$ change?
    (d) Draw the plot of log $[R]_0$/ [R] vs time (sec)



12. Propose mechanism of the reaction taking place when
    (a) (-)-2-bromopentane reacts with sodium hydroxide to form (+)-pentan-2-ol.
    (b) ethanol is heated with conc.H_2SO_4 at 443K

(½ +1/2+ 1+1)

13 Explain : (a) Grignard reagents should be prepared under aprotic conditions.
(b) $C_6H_5CHClCH_3$ is hydrolysed more easily with KOH than $C_6H_5CH_2Cl$

14 Give chemical tests to distinguish between compounds in each of the following pairs:
(i) phenol and ethyl alcohol.
(ii) Butan-2-ol and propan-2-ol

15 Account for the following facts:
(i) Primary amines have higher boiling point than tertiary amines.
(ii) Aniline does not undergo Freidel Crafts reaction.

16 Explain giving reason for each of the following :
(i) Phenol is more acidic than propanol.
(ii) Ethers are stored in dark coloured bottles

17 (a) state and explain Faraday's second law of electrolysis.
(b) Write the Nernst equation and calculate e.m.f of cell and maximum work obtainable from the following cell: Fe (s)/ Fe^{2+}(0.001 M) // H^+(1M) / H_2(g)(1bar) / Pt(s) $E^\circ_{Fe2+/Fe}$ = -0.44 V

18 A 0.561 molal solution of an unknown electrolyte depresses the freezing point of water by 2.93 °C. What is van't Hoff factor for this electrolyte ? The freezing point depression constant for water is 1.86°C kg mol^{-1}

19 Conductivity of 0.00241 M acetic acid solution is 7.896×10^{-5} S cm^{-1}. Calculate its molar conductivity in this solution. If molar conductivity at infinite dilution for acetic acid be 390.5 S cm^2 mol^{-1}, what would be its dissociation constant ?

20 The rate constant of a reaction at 400 K and 800 K are 0.02 s^{-1} and 0.07 s^{-1} respectively. Calculate the value of activation energy for the reaction.

21 Write short notes on the following : (i) Zone refining (ii) van –Arkel method of refining.

22 Explain the following reactions by giving suitable examples :
(i) Clemmension reduction (ii) Hell Volhard Zelinsky reaction

OR

What happens when :
(i) n-butyl chloride is treated with alcoholic KOH
(ii) ethyl chloride is treated with aqueous KOH
(iii) bromoethane is treated with magnesium in the presence of dry ether

23 Shanti , a domestic helper of Mrs. Anuradha, fainted while mopping the floor. Mrs. Anuradha immediately took her to the nearby hospital where she was diagnosed to the severely ' anaemic '. The doctor prescribed an iron rich diet and multivitamins suppliment to her. Mrs. Anuradha , supported her finiancially to get the medicines. After a month, Shanti was diagnosed to be normal. After reading the above passage, answer the following questions : (i) What values are displayed by Mrs. Anuradha ?
(ii) Name the vitamin whose deficiency causes pernicious anaemia?
(iii) Give an example of water soluble vitamin.

24 Give the chemical equations for the following reactions :

(i) oxidation of propan-1-ol with alkaline $KMnO_4$ solution.
(ii) Bromine in CS_2 with phenol
(iii) Treating phenol with chloroform in the presence of aqueous NaOH
(iv) bromination of benzoic acid in the presence of $FeBr_3$
(v) reaction of benzene diazonium chloride with CuCN

25 Give simple tests to distinguish between the following pair of compounds :

(i) propan-1-ol and propan-2-ol
(ii) ethanol and phenol
(iii) Ethanal and propanal
(iv) ethyl amine and N-methyl ethanamine amines
(v) ethanal and propanone

OR

Complete the following reaction , give the names of the major products :

(i) $CH_3CH_2OH + PCl_5 \xrightarrow{\text{heat}}$
(ii) $CO_2 + CH_3CH_2MgBr \xrightarrow{H_3O^+}$
(iii) $C_6H_5CH_3 \xrightarrow{\text{alk.KMnO}_4}$
(iv) $C_6H_6 + CH_3COCl \xrightarrow{\text{anhydrous AlCl}_3}$
(v) $CH_3COOH + C_2H_5OH \xrightarrow{\text{conc } H_2SO_4}$

26 Account for the following :

(i) chlorobenzene is much less reactive than chloro ethane towards nucleophilic substitution reactions
(ii) Although chlorine is an electron withdrawing group, yet it is ortho , para directing in electrophilic aromatic substitution reactions. Why
(iii) Alcohols have higher boiling point than that of the hydrocarbon of comparative molecular mass.
(iv) o- nitro phenol has higher boiling point than p- nitrophenol.
(v) 2-chloroethanoic acid is more acidic than ethanoic acid