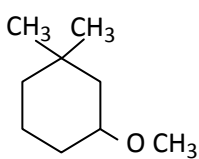


Std. 11
17-2-2018Time : 3 hrs.
Max. Marks : 70

General Instructions:

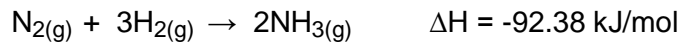
- i) Question numbers 1 - 5 carry 1 mark each.
- ii) Question numbers 6 - 10 carry 2 marks each.
- iii) Question numbers 11 - 22 carry 3 marks each.
- iv) Question number 23 carries 4 marks.
- v) Question numbers 24 - 26 carry 5 marks each.
- vi) Use log table if necessary.

1. What is meant by homolytic fission of a covalent bond? Name the type of reactive intermediate generated. (1)
2. What will be the sign of ΔS for the reaction
$$\text{CaCO}_{3(s)} \rightarrow \text{CaO}_{(s)} + \text{CO}_{2(g)}$$
 (1)
3. State Markovnikov's rule. (1)
4. Arrange alkali metal ions in the decreasing order of hydration enthalpy. (1)
5. Mention the type of electronic displacement that takes place in the following reaction. (1)
$$>\text{C}=\text{O} + \text{CN}^- \rightarrow \begin{array}{c} >\text{C}-\text{O}^- \\ | \\ \text{CN} \end{array}$$
6. Explain sp^3d^2 hybridization with the help of an example. (2)
7. Calculate the volume of O_2 liberated by heating 12.25g of KClO_3 at STP according to the reaction:
$$2\text{KClO}_{3(s)} \rightarrow 2\text{KCl}_{(s)} + 3\text{O}_{2(g)}$$
 (Atomic Mass of K=39u, Cl=35.5u, O=16u) (2)
8. Balance the redox reaction:
$$\text{MnO}_4^- + \text{SO}_2 \rightarrow \text{Mn}^{2+} + \text{HSO}_4^-$$
 (Acidic Medium) (2)
9. Account for the following:
 - i) Magnesium does not show any flame colouration.
 - ii) Group 1 elements have low melting and boiling points. (2)
10. Give a chemical test to distinguish between following pairs of compounds
 - i) ethane and ethene
 - ii) but -1-yne and but -2-yne(OR)
-OH group attached to benzene ring is ortho-para directing and activating. Explain with the help of resonance structures. (2)
11. a) Using s, p, d notations describe the orbital with the following quantum numbers
 - i) $n = 3, l = 1$
 - ii) $n = 1, l = 0$b) Write the orbital electronic configuration and number of unpaired electrons in Cr^+ . (Atomic No. Cr = 24) (3)

12. Explain giving reason
- Lead (II) Chloride is more stable than lead (IV) chloride.
 - Atomic radius of Gallium is less than that of Aluminium.
 - Boron does not form B^{3+} ion. (3)
13. Complete the following reactions
- $LiNO_3 \xrightarrow{\Delta}$
 - $Mg + N_2 \xrightarrow{\Delta}$
 - $H_3BO_3 \xrightarrow{\Delta} A \longrightarrow B$ (3)
14. For the reaction $N_{2(g)} + 3H_{2(g)} \rightarrow 2NH_{3(g)}$ $\Delta H = -95.4$ kJ; $\Delta S = -198.3$ J/K.
Calculate the temperature at which Gibb's free energy change is equal to zero.
Predict the nature of the reaction at this temperature. (3)
15. Concentrated aqueous sulphuric acid is 98% H_2SO_4 by mass and has a density of 1.84 g/L. Calculate molarity. What volume of the concentrated acid is required to make 5.0 litre of 0.500M H_2SO_4 solution. (Molar mass of $H_2SO_4 = 98$ g) (3)
16. a) Write the Molecular orbital configuration of O_2^+ . Calculate bond order and also predict its magnetic behaviour. (Atomic No. O = 8)
- b) BF_3 has zero dipole moment although the B-F bonds are polar. Explain.
(OR)
- Why is sigma bond stronger than pi bond?
 - Bond angle in NH_3 is more than that in H_2O . Give reason.
 - Arrange the following compounds in the increasing order of bond length:
HF, HI, HCl, HBr (3)
17. a) How to carry out the following conversions?
- benzene to p-bromonitrobenzene
 - ethyne to but-2-ene
- b) Why does benzene not undergo addition reactions? (3)
18. Write IUPAC name of the following compounds:
- $$CH_3 - CO - \underset{\substack{| \\ NH_2}}{CH} - \underset{\substack{| \\ COOH}}{CH} - CH_2 - CH_3$$
 - $CH \equiv C - CH = CH_2$
 -  (3)
19. a) How will you test the presence of sulphur in the given organic compound?
- b) 0.3780g of an organic chloro compound gave 0.5740g of silver chloride in Carius estimation. Calculate the percentage of chlorine present in the compound.
(Atomic mass Ag = 108g, Cl = 35.5g) (3)

20. a) Explain the order of stability of carbocations giving reason.
 b) Addition of HBr to propene in the presence of benzoyl peroxide yields 1 - bromopropane. Explain with suitable mechanism steps. (3)
21. An organic compound A with molecular formula C_3H_8O reacts with conc. H_2SO_4 gives B, which on reaction with HCl gives C. Compound C reacts with metallic sodium to give D. Identify compounds A, B, C and D. (3)
22. a) Name the gas with the smell of rotten eggs.
 b) Name any two coloured ions.
 c) Name the confirmatory test for : i) Al^{3+} ii) NO_3^- (3)
23. A solution of an electrolyte can be stored in a particular vessel only in case there is no chemical reaction taking place with the material of the vessel. The teacher asked a student Achin, is it possible to store silver nitrate in copper vessel. Achin explained to the teacher that it is not possible to store silver nitrate solution in copper vessel.
 i) Why is it not possible to store silver nitrate in copper vessel?
 ii) What is oxidation according to electronic concept?
 iii) Give the chemical reaction between silver nitrate and copper metal.
 iv) Name the anode and cathode in the above reaction. (4)
24. a) Propanal and Pentan-3-one are the ozonolysis product of an alkene. What is the structural formula of the alkene? Write the complete reaction.
 b) Complete the following reactions:
 i) $CH_3 - \underset{\substack{| \\ Cl}}{CH} - CH_2 - CH_3 \xrightarrow{alc\ KOH}$
 ii) $CH_3CH_2Br + Mg \xrightarrow{Dry\ ether}$
 iii) $\begin{array}{c} COONa \\ | \\ \text{C}_6\text{H}_5 \end{array} + NaOH \xrightarrow{CaO}$
 (OR)
 a) What are nucleophiles? Give example.
 b) Give chemical equations to explain the following reactions:
 i) Kolbe's electrolysis.
 ii) Friedel-Crafts acylation.
 c) Give mechanism for the following reaction.
 $\text{C}_6\text{H}_6 + Cl_2 \xrightarrow{Anhy\ AlCl_3}$ (5)
25. a) Write the general electronic configuration of d-block elements.
 b) Assign the position of element having outer electronic configuration ns^2np^4 for $n = 3$
 c) Account for the following:
 i) Ionisation enthalpy of ${}_7N$ is more than that of ${}_8O$.
 ii) Noble gases have high positive values of electron gain enthalpy.
 iii) Anions are bigger in size than their parent atom.
 (OR)
 a) Arrange the following in the increasing order of the property indicated:
 i) $F^-, O^{2-}, Mg^{2+}, Na^+$ (Ionic radii)
 ii) B, C, Si, N, F (Non metallic character)
 b) Write any two characteristics of d-block elements.
 c) Define electronegativity.
 d) Electron gain enthalpy of ${}_9F$ less than that of ${}_{17}Cl$. Give reason. (5)

26. a) What is common ion effect?
b) Write the K_{sp} expression for Ag_2CrO_4 ?
c) On the basis of Le-Chatelier's principle, explain how temperature and pressure can be adjusted to increase the yield of ammonia in the following reaction:



- d) Calculate the pH of 0.005 M HCl solution.

(OR)

- a) Write the conjugate acid for NH_2^-
b) Calculate the degree of dissociation and concentration of H_3O^+ ions in 0.01M solution of formic acid. $K_a = 2.1 \times 10^{-4}$ at 298K.
c) The value of K_c for the reaction $2HI_{(g)} \rightarrow H_{2(g)} + I_{2(g)}$ is 1×10^{-4} . At a given time, the composition of the reaction mixture is $[HI] = 2 \times 10^{-5} \text{ M}$, $[H_2] = 1 \times 10^{-5} \text{ M}$ and $[I_2] = 1 \times 10^{-5} \text{ M}$. In which direction will the reaction proceed? (5)

-x-x-x-x-x-x-