# GULF SAHODAYA EXAMINATION 2011 --2012
## (SAUDI CHAPTER)
## SET –A

**Subject : Chemistry**
**Class:XI**

**Time : 3 Hrs.**
**MaxMarks: 70**

*General Instructions*

1. ***All questions are compulsory***
2. ***Questions 1 to 8 are very short answer questions and carry one marks.***
3. ***Questions 9 to 18 are short answer questions and carry two marks.***
4. ***Questions 19 to 27 are short answer questions and carry three marks.***
5. ***Questions 28 ,29,30 are long answer questions and carry five marks.***
6. ***Use log tables if necessary.***

1. Find the number of moles of carbon atoms present in 3 moles of ethane
2. Which out of $SO_2$ and $CO_2$ is polar. Why?
3. Write the expression of Bohr Frequency rule.
4. Give the structure of octane-2,4-dione.
5. What is the atomic number of the element with outer electronic configuration $ns^2np^3$ where n = 3 .
6. What are electrophiles ?
7. Write the conjugate acid for the following bronsted bases $NH_2^-$ ,$HCO_3^-$
8. $H_2O_{(l)} \rightarrow H_2O_{(g)}$ , the change in entropy in the given phase change is positive or negative . Why?
9. 1. Boron has two isotopes ,the relative abundance of $^{10}B$ is 20 % and that of $^{11}B$ is 80 %. Find the average atomic mass of Boron.

   2. In a reaction $A + B_2 \rightarrow AB_2$ , Identify the limiting reagent if 300 atoms of A reacts with 200 molecules of $B_2$.
10. State the following

    1) Pauli' exclusion principle .

    2) Hund' rule of maximum multiplicity.
11. 0.40 g of organic compound give 0.3 g of silver bromide by Carius method, find the percentage of bromine in the organic compound.(atomic weight of Ag = 108,Br = 80).
12. What happens when

    1)Chlorine reacts with slaked lime.

    2)Magnesium is burnt in air .

13. 1. Write the van der Waal's equation for 'n' moles of real gas .

    2. Critical temperature of carbon dioxide and methane are 31.1 $^0$C and - 81.9 $^0$C respectively. Which of these has stronger intermolecular forces and why?

14. Define hybridisation.With diagram explain the formation of ethyne molecule.

**OR**

Describe the hybridisation in $PCl_5$ . Why the axial bonds are longer than equatorial bonds in $PCl_5$ ?

15. 2.46 g of NaOH is dissolved in water and solution is made to 100 ml. Calculate the molarity of the solution. How much of above solution is required to make 50 ml of 0.1 M NaOH solution .(Na=23 ,O=16,H=1)

16. 1) Find the geometry of the following moleculesVSEPR theory

    1) $SF_4$ 2) $XeF_4$

    2) Why $Be_2$ does not exist by MO theory?

17. At $0^0$ C, the density of certain oxide of a gas at 2 bar pressure is same as that of nitrogen at 5 bar pressure .What is the molecular mass of gaseous oxide ?

18. 1) Derive the relation $\Delta H = \Delta U + \Delta nRT$ for a gaseous reaction.

    2) Find the relation between $\Delta H$ and $\Delta U$ for the reaction $N_2O_{4(g)} \rightarrow 2NO_{2(g)}$.

19. 1) Covert the following

    a) Ethyne to chlorobenzene

    b) Phenol to Toluene

    2) Find the number of sigma bonds and pi bonds in Cyclopentene.

20. 1) Justify the presence of 18 elements in 4th period of the periodic table.

    2) Why the size of cation is less than its parent atom ?

    3) Find the IUPAC name and symbol of element with atomic number 117.

21. 1) Depict the galvanic cell in which the following redox reaction takes place.

    $Cu^{2+}_{(aq)} + Zn_{(s)} \rightarrow Zn^{2+}_{(aq)} + Cu_{(s)}$

    2) Balance the following redox reaction by ion-electron method

    $MnO_4^- + I^- \rightarrow MnO_2 + I_2$ (basic medium).

22. How is Sodium Carbonate prepared by Solvay process ? Write the chemical equations involved .

**OR**

Give reason

1) Lithium salts are commonly hydrated than other alkali ions.

2) Hydroxides and carbonates of sodium and potassium are easily soluble in water while corresponding salts of calcium and magnesium are sparingly soluble in water.

23. 1) Explain ,why are organic liquid vaporizes at a temperature below its boiling point in its steam distillation ?

2) Write the resonance structures of $CH_3COO^-$ and show the movement of electrons by curved arrows.

3) Identify the isomerism exhibited by the following pairs

a) Pent-2-ene and Pent-1-ene b) 2-methylpropane and butane

24. 1) Hydrogen Peroxide is used to restore the colour of old paintings containing PbS.Write the balance equation for the reaction that take place in the process.

2) What you understand by the following.

a) Hard water b) Water gas shift reaction

25. 1) What are pesticides and herbicides? Give one example.

2) Statues and monuments in India are affected by acid rain, how?

26. 1) What is the wave length of light emitted when an electron in hydrogen atom undergoes transition from an energy level with n=4 to an energy level n=2 ?[Rh=109677]

2) Write the electronic configuration of Chromium -24.

27. The combustion of one mole of benzene takes place at 298 K and one atm. After combustion ,$CO_{2(g)}$ and $H_2O_{(l)}$ are produced and 3267 kJ, of heat is liberated .Calculate the standard enthalpy of formation ($\Delta_f H^0$)of benzene. $\Delta_f H^0$ of $CO_{2(g)}$ is - 393.5 kJ/mol and $\Delta_f H^0$ of $H_2O_{(l)}$ is - 285.83 kJ/mol.

28. 1) Write the chemical reaction of the following

a) Borax is heated strongly .

b) Aluminum is treated with dilute NaOH.

2) What are Silicones ? How are they prepared? What are its uses?

**OR**

Give reasons

1) Conc $HNO_3$ can be transported in Al containers.

2) $BF_3$ is a non -polar molecule.

3) $PbCl_4$ is less stable than $PbCl_2$ .

4) $SiF_6^{2-}$ is known where as $SiCl_6^{2-}$ do not exist.

5) White fumes appear around the bottle of anhydrous aluminum chloride .

29. 1) Derive the relation between Kp and Kc.

2) State Le-Chatelier's principle.

3) Describe the effect of

a) Increase in the concentration of methanol .

b) Decrease in the concentration of carbon monoxide

c) Increase in pressure

d) Addition of inert gas at constant volume on the equilibrium of the reaction

$CO_{(g)} + 2H_{2(g)} \rightleftarrows CH_3OH_{(g)}$

**OR**

1) Derive Henderson - Hassel Balch equation for the pH of an acidic buffer.
2) Calculate the pH of the solution obtain by dissolving 0.3g of Calcium hydroxide dissolved in water to give 500 ml solution(Ca = 40,O = 16, H=1).
3) Write the Kp expression for the following equilibrium
$2SO_{2(g)} + O_{2(g)} \rightleftarrows 2SO_{3(g)}$

30. 1) Addition of HBr to propene gives 2-bromo propane as the major product. State the rule and mechanism of the reaction.
2) Give reason
a) But-1-yne is more acidic than but-1-ene.
b) Benzene is extra ordinarily stable though it contains three double bond.
3) Draw the resonating structures of phenol.

**OR**

1) Write short notes on
a) Wurtz reaction b)Aromatisation
2) An alkene on ozonolysis gives a mixture of propanone and ethanal.Write the structure and IUPAC name of alkene along with equation.
3) Write the principle of chromatography.