

# PRACTICE PAPER

Subject - Chemistry

Class - XI

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## General Instructions -

- (i) Attempt all questions.
- (ii) Q. No. 1 to 5 carries 1 mark each.
- (iii) Q. No. 6 to 10 carries 2 marks each.
- (iv) Q. No. 11 to 22 carries 3 marks each.
- (v) Q. No. 23 carries 4 marks.
- (vi) Q. No. 24 to 26 carries 5 marks.

1. Which of the following ions is smallest, why?  
 $N^{3-}$ ,  $O^{2-}$ ,  $F^{-}$
2. Write ideal gas equation for "n" moles of gas.
3. Write the conjugate bases for  $NH_4^+$ ,  $HCO_3^-$ .
4. Write the structural formula of 2-methyl cyclohexane.
5. Why is the staggered conformation of ethane more stable than eclipsed conformation.
6.
  - a. State the law of constant proportion.
  - b. Why is the molality of solution independent of temperature.
7.
  - a. Predict the sign of  $\Delta S$  for the following reaction.  
 $CaCO_3 (s) \longrightarrow CaO(s) + CO_2(g)$
  - b. State Hess's Law.
8. Calculate the bond order of  $N_2$  and  $N_2^+$  and compare their stability.
9. Give reason:
  - a.  $Na_2O_2$  is diamagnetic in nature.
  - b. Potassium is more reactive than sodium.
10. In carius method of estimation of halogen 0.30 g of an organic compound gave 0.24 g of AgBr. Find out the % of bromine in the compound.  
(molar mass of AgBr = 188 g/mol, Atomic mass of Br = 80 g/mol.)
11. 10 g of Ag reacts with 1 g of sulphur. Calculate the mass of  $Ag_2S$  formed. will any of the two reactants remain unreacted? if yes, which one and what would be its mass.  
(Atomic mass of Ag = 108 g/mol, Atomic mass of S = 32 g/mol.)
12.
  - a) Which series of lines of the hydrogen spectrum lies in UV region.
  - b) The mass of electron is  $9.1 \times 10^{-31} kg$ , if its kinetic energy is  $3 \times 10^{-25} J$ , calculate its wavelength. ( $h = 6.626 \times 10^{-34} JS$ ).



22. a. Which acid is not present in acid rain.  
 $\text{HNO}_3$ ,  $\text{H}_2\text{SO}_3$ ,  $\text{H}_2\text{SO}_4$ ,  $\text{CH}_3\text{COOH}$ ,  $\text{H}_2\text{CO}_3$
- b.  $\text{CO}_2$  is inert and harmless gas, yet it is thought to be a serious pollutant. Explain.
23. Scientist have harnessed the principles of photosynthesis to develop a new way of production of hydrogen in a break through that offers a possible solution to global energy problems. The researchers claim the development could help unlock the potential of hydrogen as a clean, cheap and reliable power source. Hydrogen can be burned to produce energy without producing emissions like fossil fuels. Hydrogen is produced by electrolysis of water. Scientists have separated water into hydrogen and oxygen like plants use sun's energy to split  $\text{H}_2\text{O}$  molecule into  $\text{H}_2$  and  $\text{O}_2$ . This research offers promise in making storage of green energy cheaper.
- a. name the most abundant element in the universe.
- b. what are the values possessed by the scientists.
- c. why is  $\text{H}_2$  ideal fuel.
- d. what are the disadvantages of using  $\text{H}_2$  as a fuel.
24. a. How will you convert the following:
- acetylene to chlorobenzene
  - ethyl bromide to ethyne
- b. Give a chemical test to distinguish between hexane and hexene.
- c. Give reasons:
- why does neo pentane has lower boiling point than n-pentane.
  - dry ether is used as a solvent in wurtz reaction.

**OR**

- a. An alkyl halide X ( $\text{C}_3\text{H}_7\text{Cl}$ ) on reaction with alc.KOH gives alkene Y which on reaction with water in presence of  $\text{H}_2\text{SO}_4$  gives "Z". Z is also obtained from X by reaction with aq.KOH. Identify X, Y, Z and write the reactions involved.
- b. Complete the following reactions:
- $\text{C}_6\text{H}_6 + \text{C}_2\text{H}_5\text{COCl} \xrightarrow{\text{AlCl}_3}$
  - $\text{C}_6\text{H}_6 + \text{Cl}_2 \xrightarrow{\text{sunlight}}$
25. a. Account for the following:
- $\text{SiF}_4$  forms  $\text{SiF}_6^{2-}$  while  $\text{CCl}_4$  does not form  $\text{CCl}_6^{2-}$ .
  - $\text{PbCl}_2$  is more stable than  $\text{PbCl}_4$ .
  - $\text{SnCl}_2$  is solid whereas  $\text{SnCl}_4$  is liquid.
- b. Complete the following reactions:
- $\text{Si} + \text{CH}_3\text{Cl} \xrightarrow{\text{Cu}/570\text{K}}$
  - $\text{SiCl}_4 + \text{H}_2 \xrightarrow{\text{heat}}$

**OR**

- a. Draw the structure of  $\text{SiO}_4^{2-}$ .
- b. Give reason:
1.  $\text{CH}_4$  is more stable than  $\text{SiH}_4$ .
  2.  $\text{CO}_2$  is gas,  $\text{SiO}_2$  is solid.
- c. Complete the following reactions:
1.  $\text{Sn} + \text{Cl}_2 \longrightarrow$
  2.  $\text{Al}(\text{OH})_3 + \text{NaOH} \longrightarrow$
26. a. The concentration of hydrogen ion sample of soft drink is  $4 \times 10^{-3}$  M. Calculate its PH.
- b. The equilibrium constant K for the reaction:
- $$\text{H}_2 (\text{g}) + \text{I}_2 (\text{g}) \longrightarrow 2\text{HI} (\text{g}) \text{ is } 4.$$
- What will be the equilibrium constant for the reaction:
- $$\text{HI} (\text{g}) \longrightarrow \frac{1}{2} \text{H}_2 (\text{g}) + \frac{1}{2} \text{I}_2 (\text{g})$$
- c. What is solubility product? what is the effect of temperature on  $K_{sp}$ .

**OR**

- a. What do you conclude when  $Q_c > K_c$ .
- b. What is meant by common ion effect.
- c. What is the effect of temperature on  $K_w$ .
- d.  $K_w$  of water at 373 K is  $1 \times 10^{-12}$ . What will be the PH of water at 373K is water acidic, basic or neutral at this temperature.

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