SAMPLE PAPER

CLASS XI

CHEMISTRY

Time: 3 Hours **Maximum Marks: 70**

General Instructions:

(3) All questions are compulsory.

(4) Marks of each question are indicated against it.

(5) Question nos. 1 to 8 are very short answer questions and carry 1 mark each.

(6) Question nos. 9 to 18 are short answer questions and carry 2 marks each.

(7) Question nos. 19 to 27 also short answer questions and carry 3 marks each.

(8) Question nos. 28 to 30 are long answer question and carry 5 marks each.

(9) Use log tables if necessary, use of calculators is not allowed.

Q1 How are 0.50 mol Na $_2CO_3$ and 0.50 M Na_2CO_3 different?

Q2 How many subshells are present in M shell?

Q3 Which property of element is used to classify them in long form of periodic table?

Q4 Write resonance structure of Ozone or sulphurdioxide.

Q5 Write conjugate base for water and NH_4+ species.

Q6 What do you understand by Hydrogen economy?

Q7 Find out oxidation number of chromium in $K_2Cr_2O_7$ molecule

Q8 Indicate sigma and pie bonds in $CH_2=C=CH_2$. 1 X 8 = 8 Marks

Q9 Calculate number of photons with a wavelength of 3000pm that provides 1 Joule of energy. 2 Marks

Q10 Explain why bond angle in NH_3 is more than in H_2O molecule though both have sp3 hybridization. 2 Marks

Q11 At constant temperature if the pressure of a fixed mass of gas is doubled what happens to its volume ? Which law governs this behavior of gases? 2 Marks

Q12 How many grams of oxygen is required for complete combustion of 29g of butane as per the equation $C_4H_{10}+ \ 4.5O_2=2CO_2+5H_2O$ 2 Marks

Q13 Calculate bond order of oxygen molecule. List all the information provided by the bond about this molecule. 2 Marks

Q14 Calculate the total pressure in a mixture of 16 g of oxygen and 4g of Hydrogen confined in a vessel of 1dm-^{3} at 27 degree celsius. (Molar mass of oxygen 32 Hydrogen 2 R= 0.083bar dm^3 K-1mol-1) 2 Marks

Q15 Balance following equation in acidic medium showing all steps,

$Br_2 + H_2O_2 \rightarrow BrO_2 + H_2O$ 2 Marks

Q16How are silicones prepared? Write necessary reaction. Write two uses of silicones. 2 marks

Q 17 What is demineralised water? How is it obtained? 2 Marks

Q18 What is the reason of diagonal relationship of elements? Write two properties of any two diagonally related elements.

Or

Give reasons

(1) why alkali metals when dissolved in Liquid ammonia give blue solution?

(2)Beryllium and Magnesium do not impart colour to the flame while other members do.

Q19 (1) State Heisenberg s Uncertainty principle.

(2) Write electronic configuration of Cu metal (Z=29) and Cr^{3+} ion.

(3)Which orbital is represented by n=4 and l=3? 3 Marks

Q20 Explain why

(1) Halogens act as good oxidizing reagent.

(2)Electron gain enthalpy of inert gases is zero.

(3)Ionization enthalpy of Mg is higher than that of Na. 3 Marks

Q21 (1) What do you mean by Bond Enthalpy?

(2) Calculate bond enthalpy of Cl---Cl bond from following data.

$CH_4(g) + Cl_2(g) \rightarrow CH_3Cl(g) + HCl(g)$ $\Delta H = -109.3$kJ mol-1

Bond enthalpy of C—H Bond = 413kJ, C—Cl Bond =326 kJ and H—Cl Bond =431kJ mol -1

3 Marks

Q22 (1) What are extensive properties?

(2) Write Gibbs free energy equation giving meaning of each term used.

(3) Under what condition $\Delta U = \Delta H$? 3 Marks

Q23Write chemical equation only for preparation of

(1) Plaster of Paris

(2) Quick lime

(3) slaked lime. 3 Marks

Q24 (1) What do you mean by functional isomerism?

(2) What are electrophiles?

(3) What is inductive effect ? Give an example. 3 Marks

Or

(1) Write IUPAC names for $C_6H_5CH_2CHO$ and $(CH_3)2—CH(NH_2)—CH_3$

(2) Write an example of geometrical isomerism.

(3) What do you mean by electromeric effect? 3 Marks

Q25(1) Draw eclipsed and staggered conformations of ethane.

(2)Write one equation each to show Wurtz reaction and Friedal craft alkylation. 3 Marks

Q26 (1) How nitrogen is detected in an organic compound.?Wrire necessary reactions.

(2) How a molecular formula is different from empirical formula? 3 Marks

Q27 (1) What do you mean by green chemistry?

(2) Explain terms BOD and COD with reference to environmental chemistry. 3 Marks

Q28 (1) For the reaction $N_{2(}g) + 3H_2 (g) \leftrightarrow 2NH_3(g)$ the value of Kp is 3.6 $x10^{2}$-+ 2-2 at 500 K. Calculate the value of Kc for the reaction at the same temperature. R=0.083 bar L K-1 mol-1.

(2) What do you understand by (1) Common ion effect (2) Buffer solution.

3+2 Marks

Or

(1) For the reaction $PCl_5 \leftrightarrow PCl_3+Cl_2$ at 473K the value of equilibrium constant Kc is 8.3 $x10^{-3}$ (1) Write an expression for Kc (2)What is the value of Kc for reverse reaction at same temperature.(3) What would be effect on Kc if pressure is increased.

(2) State Henry's Law. Write pH value of 1x10-5 M HCl solution. 3+2 Marks

Q29 Give reasons for

(1)$[SiF_6^{2}]$- is known whereas $[SiCl_6]^{-2}$ is not known.

(2) Diamond is a covalent solid, yet it has highest Melting Point.

(3) Boric acid is considered a weak base.

(4) BF3 behaves as Levis acid.

(5) CO_2 is a gas while SiO_2 is a solid at room temperature.

Or

(1) What are fullerenes?-

(2) Why is boric acid monobasic?

(3)What is inert pair effect?

(4)Why is $PbCl_2$ is a good oxidizing reagent?

(5)Write the formula of inorganic benzene.

Q30 (1) State Markovnicoff's rule. Using this write the reaction of propene with HCl.

(2) Carry out following conversions

(1) Ethyl alcohol to ethane.

(2) Sodium acetanilide to benzene.

(3) Benzene to nitrobenzene. 2+3 Marks

Or

(10)Write two reactions to show acidic nature of ethyne

(11)Complete the following reactions-

ozone/Zn/H_2O

(12)CH_3—CH=CH_2----------→

aquous $KMnO_4$

(13)CH_3—CH=CH_2----------→

(14)CH=CH + Br_2 water----------→

Marking Scheme
SESSION ENDING EXAMINATION
CLASS XI

CHEMISTRY

Q1 Correct meaning ½ +1/2

Q2 Two one s and one p ½ +1/2

Q3 Atomic Number

Q4 Correct structure 1 mark

Q5 Correct answer ½ +1/2

Q6 correct answer 1mark

Q7 +6 1mark

Q8 Sigma 6 pie 2 1mark

Q9 E=hv ½

= $6.626 \times 10^{-34} \times 3000 \times 10^{-10} = 19.878 \times 10^{-41}$ J 1mark

$1/19.878 \times 10^{-41} = 5.03 \times 10^{-39}$ photons ½ mark

Q10 Correct explanation with correct structure 1+1 mark

Q11 Decreases to half, Boyle's Law 1+1 mark

Q12 Correct formula ½ mark

Correct values and calculation 1mark

Ans. 2.06 mol/ Kg ½ mark

Q13 correct formula ½ mark

Correct values and calculation 1mark

Correct answer with units ½ mark

Q14 correct bond order 1mark + correct information 1mark

Q15 correct steps 4x1/2 =2

Q16 correct method +correct uses 1+1 mark

Q17 correct reasons 1+1 or correct reason 1mark+ two properties 1mark

Q 18 correct definition + One correct method 1+1 mark

Q19 (1) correct definition 1mark

(2) Correct configuration ½ +1/2

(3) 4f 1mark

Q20 correct answer 1mark each

Q21 correct definition 1mark

∑ Bond enthalpy of reactants - ∑ Bond enthalpy of Products ½ mark

Correct value and calculation 1 mark

Answer 234.7 kJ ½ mark

Q22 Correct answer 1mark each

Q23 Correct method with equation 1mark each

Q24 Correct Answer of each part 1mark each

Q25 Correct Answer of each part 1mark each

Q26 Correct method with equation 2mark

Correct relation 1mark

Q27 correct answer of each part 1mark each

Q28 (1) Correct relation ½ mark, $\Delta n=-2$ ½ mark

Correct value and calculation 1 mark , answer ½ mark

(2) Correct meaning 1mark each

Or (1) Correct answer of each part 1mark each

(2) Correct statement 1mark, pH=5 1mark

Q29 Correct answer of each part 1mark each.

Q30 (1) Correct rule 1 mark , correct reaction 1mark

(2) Correct answer of each part 1mark each

Or

(1) two correct reaction 2 mark

(2) Correct answer of each part 1mark each.