

**CBSE Board
Class XI
Chemistry
Sample Paper 8**

Q1. Which one of the following properties is not shown by NO?

- (A) It combines with oxygen to form nitrogen dioxide
- (B) It's bond order is 2.5
- (C) It is diamagnetic in gaseous state
- (D) It is a neutral oxide

Sol. (C)

Q2. Which one of the following statements is true?

- (A) The gas equation is not valid at high pressure and low temperature
- (B) The product of pressure and volume of a fixed amount of gas is independent of temperature
- (C) Molecules of different gases have the same kinetic energy at a give temperature
- (D) The gas constant per molecule is called as Boltzmann's constant

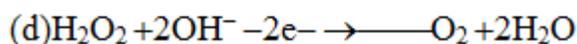
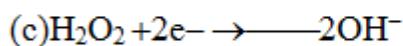
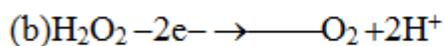
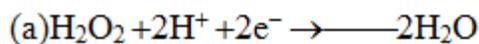
Sol. (D)

Q3. The metal that cannot be obtained by electrolysis of an aqueous solution of its salts is:

- (A) Cu
- (B) Cr
- (C) Ag
- (D) Ca

Sol. (D)

Q4. In which of the following reactions H₂O₂ acts as a reducing agent?



- (A) (a), (c)
- (B) (b), (d)
- (C) (a), (b)
- (D) (c), (d)

Sol. (B)

- Q5. For the reaction, $\text{SO}_2(\text{g}) + 1/2 \text{O}_2(\text{g}) \rightleftharpoons \text{SO}_3(\text{g})$, if $K_p = K_c(\text{RT})^x$ where the symbols have usual meaning then the value of x is:(assuming ideality)
- (A) 1/2
(B) 1
(C) -1
(D) -1/2

Sol. (D)

- Q6. The correct set of four quantum numbers for the valence electron of rubidium atom($Z=37$) is:
- (A) 5,1,1,+1/2
(B) 5,0,1,+1/2
(C) 5,0,0,+1/2
(D) 5,1,0,+1/2

Sol. (C)

- Q7. The ratio of masses of oxygen and nitrogen in a particular gaseous mixture is 1 :4. The ratio of number of their molecules is:
- (A) 1:8
(B) 3:16
(C) 1:4
(D) 7:32

Sol. (D)

- Q8. Among the following oxoacids, the correct decreasing order of acid strength is:
- (A) $\text{HClO}_4 > \text{HClO}_3 > \text{HClO}_2 > \text{HOCl}$
(B) $\text{HClO}_2 > \text{HClO}_4 > \text{HClO}_3 > \text{HOCl}$
(C) $\text{HOCl} > \text{HClO}_2 > \text{HClO}_3 > \text{HClO}$
(D) $\text{HClO}_4 > \text{HOCl} > \text{HClO}_2 > \text{HClO}_3$

Sol. (A)

Q9.

For complete combustion of ethanol, $\text{C}_2\text{H}_5\text{OH}(\text{l}) + 3\text{O}_2(\text{g}) \rightarrow 2\text{CO}_2(\text{g}) + 3\text{H}_2\text{O}(\text{l})$, the amount of heat produced as measured in bomb calorimeter, is $1364.47 \text{ kJ mol}^{-1}$ at 25°C . Assuming ideality the Enthalpy of combustion, ΔH_c , for the reaction will be: ($R = 8.314 \text{ kJ mol}^{-1}$)

- (A) $-1460.50 \text{ kJ mol}^{-1}$
(B) $-1350.50 \text{ kJ mol}^{-1}$

- (C) $-1366.95 \text{ kJ mol}^{-1}$
- (D) $-1361.95 \text{ kJ mol}^{-1}$

Sol. (C)

- Q10. The first ionization potential of Na is 5.1 eV. The value of electron gain enthalpy of Na^+ will be:
- (A) -5.1 eV
 - (B) -10.2 eV
 - (C) $+2.55 \text{ eV}$
 - (D) -2.55 eV

Sol. (A)

- Q11. Stability of the species Li_2 , Li_2^- and Li_2^+ increases in the order of:
- (A) Li_2 , Li_2^- and Li_2^+
 - (B) Li_2^+ , Li_2 and Li_2^-
 - (C) Li_2^+ , Li_2^- and Li_2
 - (D) Li_2^- , Li_2 and Li_2^+

Sol. (A)

- Q12. The molarity of a solution obtained by mixing 750 mL of 0.5 (M) HCl with 250 mL of 2(M)HCl will be:
- (A) 1.00 M
 - (B) 1.75 M
 - (C) 0.975 M
 - (D) 0.875 M

Sol. (D)

- Q13. Which of the following is the wrong statement?
- (A) O_3 molecule is not bent
 - (B) Ozone is violet-black in solid state
 - (C) Ozone is diamagnetic gas
 - (D) ONCl and ONO^- are not isoelectronic

Sol. (A)

- Q14. How many litres of water must be added to 1 litre of an aqueous solution of HCl with a pH of 1 to create an aqueous solution with pH of 2?
- (A) 0.9 L
 - (B) 2.0 L
 - (C) 9.0 L
 - (D) 0.1 L

Sol. (C)

Q15. Which one of the following molecules is expected to exhibit diamagnetic behaviour?

- (A) N_2
- (B) O_2
- (C) S_2
- (D) Be_2

Sol. (A)

Q16. Which of the following arrangements does not represent the correct order of the property stated against it ?

- (A) $Ni^{2+} < Co^{2+} < Fe^{2+} < Mn^{2+}$: ionic size
- (B) $Co^{3+} < Fe^{3+} < Cr^{3+} < Sc^{3+}$: stability in aqueous solution
- (C) $Sc < Ti < Cr < Mn$: number of oxidation states
- (D) $Cr^{2+} < V^{2+} < Mn^{2+} < Fe^{2+}$: paramagnetic behaviour

Sol. (B)

Q17. A piston filled with 0.04 mol of an ideal gas expands reversibly from 50.0 mL to 375 mL at a constant temperature of 37.00C. As it does so, it absorbs 208J of heat. The values of q and w for the process will be: ($R = 8.314 \text{ J/mol K}$) ($\ln 7.5 = 2.01$)

- (A) $q = -208 \text{ J}$, $w = -208 \text{ J}$
- (B) $q = -208 \text{ J}$, $w = +208 \text{ J}$
- (C) $q = +208 \text{ J}$, $w = +208 \text{ J}$
- (D) $q = +208 \text{ J}$, $w = -208 \text{ J}$

Sol. (D)

Q18. A gaseous hydrocarbon gives upon combustion 0.72 g of water and 3.08 g of CO_2 . The empirical formula of the hydrocarbon is:

- (A) C_3H_4
- (B) C_6H_5
- (C) C_7H_8
- (D) C_2H_4

Sol. (C)

Q19. Which of the following represents the correct order of increasing first ionization enthalpy for Ca, Ba, S, Se and Ar?

- (A) $S < Se < Ca < Ba < Ar$
- (B) $Ba < Ca < Se < S < Ar$
- (C) $Ca < Ba < S < Se < Ar$
- (D) $Ca < S < Ba < Se < Ar$

Sol. (B)

- Q20. For gaseous state, if most probable speed is denoted by C^* , average speed by C and mean square speed by C , then for a large number of molecules the ratios of these speeds are:
(A) $C^* : C : C = 1.128 : 1.225 : 1$
(B) $C^* : C : C = 1 : 1.128 : 1.225$
(C) $C^* : C : C = 1 : 1.125 : 1.128$
(D) $C^* : C : C = 1.225 : 1.128 : 1$

Sol. (B)

- Q21. The gas leaked from a storage tank of the Union Carbide plant in Bhopal gas tragedy was:
(A) Methylamine
(B) Ammonia
(C) Phosgene
(D) Methylisocyanate

Sol. (D)

- Q22. Which of the following samples contains 2.0×10^{23} atoms?
(A) 8.0 g O₂
(B) 3.0 g Be
(C) 8.0 g C
(D) 19.0 g F₂

Sol. (B)

- Q23. Which of the following exists as covalent crystals in the solid state?
(A) Silicon
(B) Sulphur
(C) Phosphorous
(D) Iodine

Sol. (A)

- Q24. In which of the following pairs of molecules/ions, both the species are not likely to exist?
(A) H_2^- , He_2^{2-}
(B) H_2^{2+} , He_2
(C) H_2^- , He_2^{2+}
(D) H_2^- , He_2^{2-}

Sol. (B)

- Q25. In allene (C_3H_4), the type(s) of hybridization of the carbon atoms is (are)
(A) sp and sp^3
(B) sp and sp^2
(C) only sp^2
(D) sp^2 and sp^3

Sol. (B)

- Q26. Which ordering of compounds is according to the decreasing order of the oxidation state of nitrogen?
(A) HNO_3 , NO , NH_4Cl , N_2
(B) HNO_3 , NO , N_2 , NH_4Cl
(C) HNO_3 , NH_4Cl , NO , N_2
(D) NO , HNO_3 , NH_4Cl , N_2

Sol. (B)

- Q27. The colour of light absorbed by an aqueous solution of $CuSO_4$ is
(A) orange- red
(B) blue-green
(C) yellow
(D) violet

Sol. (A)

- Q28. At ordinary temperature and pressure, among halogens, chlorine is a gas, bromine is a liquid and iodine is a solid. This is because
(A) The specific heat is in the order $Cl_2 > Br_2 > I_2$
(B) Intermolecular forces among molecules of chlorine are the weakest and those in iodine are the strongest.
(C) The order of density is $I_2 > Br_2 > Cl_2$
(D) The order of stability is $Cl_2 > Br_2 > I_2$

Sol. (B)

- Q29. Which property of halogens increase from F to I?
(A) Electronegativity
(B) First ionisation energy
(C) Bond length in the molecule
(D) None

Sol. (C)

- Q30. Which does not show inert pair effect?
(A) Al
(B) Sn
(C) Pb
(D) Thallium

Sol. (A)