SAMPLE PAPER - I
SUB : CHEMISTRY
CLASS - XI

Time Allowed: 1 hr **Maximum Marks : 70**

General Instructions:

- All question are compulsory
- Q 1 to 20 are very short answer objective type and each carries 1 mark each.
- Q 21 to 27 are short answer question and carry 2 marks each.
- Q 28 to 34 are also short answer question and carry 3 marks each.
- Q 35 to 37 are long answer questions and carry 5 marks each.
- There is no overall choice. However internal choice have been provided in some questions.
- Use of log tables if necessary. Use of calculators is not allowed.

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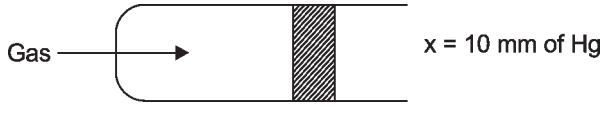
1. What are the oxygen moles in 0.5 mol of $CaCO_3$?
   (a) 1 mol (b) 0.2 mol
   (c) 1.5 mol (d) 3.0 mol
2. What is the unit of wave number (ν) ?
3. The general configuration of 'f' block is
   (a) (n-1) f^{1-14} nd^{0-1} ns2 (b) (n-1)f^{0-1} nd^2 ns^2
   (c) (n-2) f^{1-14} (n-1) d^{0-1} ns^2 (d) (n-2) f^{1-14} (n-1)d^{0-2} ns^{0-1}
4. The shape of IBr^-_2 is
   (a) Tetrahedral (b) Planar
   (c) Linear (d) V-shape
5. What is the pressure of the gas in tube



6. Arrange the following in order of decreasing boiling point : Be, Mg, Ca, Sr
7. $\Delta_f H^0$ for Graphite is _____ .
8. Nature of NaH is _____ .

Q.9 - Q.10 Assertion-Reason Type Questions

Each question contains statements-1 (Assertion) and Statement-2 (Reason) Examine the statements carefully and mark the correct answer according to the instruction given below:

A. If both the statements are true and statement-2 is the correct explaination of statement-1.

B. If both the statements are true but statement-2 is not the correct explanation of statement-1.

C. If statement-1 is true and statement-2 is false.

D. If statement-1 is false and statement-2 is true.

9. Statement-1 For reaction A + B $\rightleftharpoons$ C, K = 4 on addition of catalyst K becomes more than 4.

   Statement-2 Catalyst only helps to attain the equilibrium faster from either end of reaction.

10. Statement-1 $Cl_2 + 2OH^- \longrightarrow ClO^- + Cl^-$ is a disproportion reaction.

    Statement-2 In disproportionation, the same element get oxidised as well as reduce.

11. Complete the reaction

    $H_2(g) + Pd^{2+}(aq.) \longrightarrow$

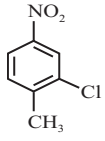
    OR

    $CO(g) + H_2O(g) \xrightarrow[\text{Catalyst}]{673K}$

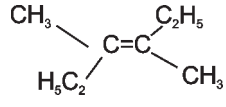
12. Why ammoniacal solution of alkali metal is blue in colour?

13. What is a producer gas?

14. Write the IUPAC name of following



OR



15. What does B.O.D. stands for?

16. Calculate number of atoms in 52u of He.

17. Which series of lines of the hydrogen spectrum lie in the visible region?

18. Write the name of element with highest electron gain enthalpy.

19. Draw the shape of ClF_3.

    OR, Draw the shape of SF_6.

20. What is the unit of 'a' in van der Waal's equation?

21. (i) What are the number of waves made by a Bohr electron in an orbit of maximum magnetic quantum number 3?

    (ii) If kinetic energy of a particle is doubled. What will happen to de Broglie wavelength as compared to previous de Broglie wavelength.

22. (i) Why $PbCl_2$ is more stable than $PbCl_4$?

    (ii) Why Electron gain enthalpy of Mg is positive?

    OR

    (i) Second I.E. (Ionisation Enthalpy) is always more than first Ionisation energy.

    (ii) Why first electron gain enthalpy of sulphur is more negative than oxygen.

23. Balance the following reaction by (ion-electron or oxidation number method)

    $Cl_2O_7(g) + H_2O_2\ (aq.) \longrightarrow ClO_2^-\ (aq.) + O_2\ (g) + H^+$ (Acidic medium)

24. (i) What is the difference between hydrolysis and hydration?

    (ii) Arrange the following in order of increasing electrical conductance CaH_2, BeH_2 and TeH_2.

25. A sample of 0.5g of an organic compound was treated according to Kjeldahl's method. The ammonia evolved was absorbed in 50 ml of 0.5 M H_2SO_4. The residual acid requirede 60 mL of 0.5 solution of NaOH for neutralisation. Find the percentage composition of nitrogen in the compound.

26. (i) Out of benzene, m-dinitrobenzene and toluene, which will undergo nitration most easily and why?

    (ii) What effect does branching of an alkane chain has on its boiling point?

27. (i) What is Eutrophication?

    (ii) What is the action of F^- on enamel present on the surface of teeth?

    OR

    (i) What is the upper limit concentration of lead in drinking water?

    (ii) What is smog? Classify them as reducing smog or oxidising smog.

28. A crystalline salt on being rendered anhydrous loses 45.6% of its weight. The percentage composition of the anhydrous salt is
Al = 10.50%, K= 15.1%, S= 24.96%, O=49.92%
Find the simplest formula of the anhydrous and crystalline salt.
(Atomic Mass : K= 39, Al = 27, S = 32, O = 16).

29. Explain following with example :
(i) Aufbau's Rule (ii) Hund's Rule (iii) Pauli's Exclusion Principle

OR

An ion with mass number 81 contains 31.7% more neutrons as compared to protons. Assign the atomic symbol.

30. Explain the bonding in SF_6 using hybridisation concept and define what is hybridisation.

OR

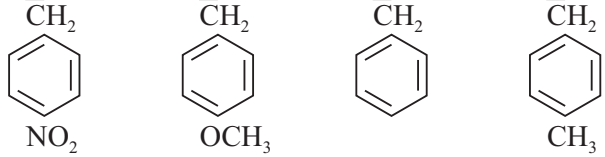
On the basis of molecular orbital theory find the bond order, molecular orbital configuration and magnetic nature of O_2^+.

31. Derive van der Waal's equation :

$$\left(P + \frac{an^2}{v^2}\right)(v - nb) = nRT$$

32. Explain Born Haber cycle with by considering example of formation of $MgCl_2$ as given in the chemical reaction
$Mg(s) + Cl_2(g) \longrightarrow MgCl_2(s)$

33. Give suitable reasons :
(i) A solution of Na_2CO_3 is alkaline why?
(ii) Beo insoluble but $BeSO_4$ soluble in water why?
(iii) Lithium salts are commonly hydrated as compare to other alkali metal ions. Why?

34. Arrange following in order of increasing stability
(a) $\overset{+}{C}H_3$ $\quad$ $CH_3\overset{+}{C}H_2$ $\quad$ $(CH_3)_3C^+$ 
(b) 

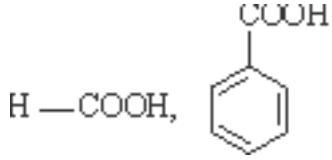
(c) $CH_3\dot{C}H_2$, $\dot{C}H_3$, $\dot{C}H_2–CH= CH_2$, $\dot{C}H = CH_2$

OR

(i) What is ambident nucleophile? Mention one example.

(ii) Distinguish between homolytic and hetrolytic bond cleavage.

(iii) Which one is stronger acid and why



35. (a) What is a buffer solution? Give example.

(b) What is common ion effect?

(c) Define Le-Chatlier principle and explain effect of following :

(i) Change of concentration (ii) Change of pressure

OR

(a) Find out K_c for following reaction

$2NOCl(g) \rightleftharpoons 2NO(g) + Cl_2(g)$; $K_p = 1.8\times10^{-4}$ at 500K

(b) $K_p = 0.04$ atm at 899K. What is the equilibrium concentration of C_2H_6 where it is placed in a flask at 4.0 atm pressure and allow to come to equilibrium

$C_2H_6 \rightleftharpoons C_2H_4(g) + H_2(g)$

(c) What is the unit of K_p for the following chemical reaction?

$2NH_3(g) \rightleftharpoons N_2(g) + 3H_2(g)$

36. (i) Show with the help of chemical reaction that Al shows amphoteric behaviour.

(ii) Draw the structure of (a) B_2H_6 (b) Boric acid.

(iii) Write the formula of Borax.

OR

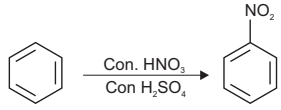
(i) Explain Lewis acid strength

$BF_3 < BCl_3 < BBr_3 < BI_3$

(ii) What are silicones? Give reaction for formation of chain silicones.

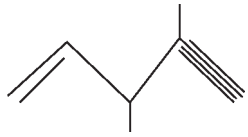
(iii) Why CO is poisionous in nature?

37. (i) Explain with the help of mechanism



(ii) Draw the Newman structure of (a) 2-Methyl butane
(b) 1-Methyl prop-1-ene

(iii) Calculate total number of σ and π bond(s) in

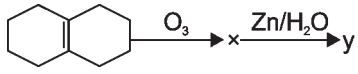


OR

(i) Explain Kolbe's electrolysis with mechanism.

(ii) State Huckel Rule's.
Check whether  is an aromatic or non aromatic, anti-aromatic.

(iii) Write the product



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