

FINAL EXAM (TERM - 2)

CLASS XI *Chemistry*

M.M – 35

Time – 2 Hr

Read the following instructions carefully.

1. There are 12 questions in this question paper with internal choice.
 2. SECTION A – Q. No 1 to 3 are very short answer questions carrying 2 marks each.
 3. SECTION B – Q. No. 4 to 11 are short answer questions carrying 3 marks each.
 4. SECTION C – Q. No. 12 is case based question carrying 5 marks.
 5. All questions are compulsory.
 6. Use of log tables and calculators is not allowed.
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SECTION A

- Q1. What is critical temperature? How is it related to Vander Waal constant 'a'?
- Q2. A balloon whose volume is 5 liter contains 6.1 g of N_2 . What mass of nitrogen must be added to the balloon to expand its volume to 11 liters at the same temperature and pressure?
- Q3. Hess's law is a corollary of the first law of thermodynamics. Comment.

SECTION B

- Q4. Derive the relation between K_p and K_c . And tell what will happen when $\Delta n_g = 1$.
- Q5. (a) The solubility of $PbCl_2$ at 298 K is 2×10^{-2} mol/L. Find out K_{sp} at this temperature.

(b) Define buffer solution with example.

OR

(a) Prove that the pressure necessary to obtain 50% dissociation of PCl_5 at 500K is numerically three times the value of K_p .

(b) Define Ostwald's law of dilution.

Q6. (a) For an isolated system $\Delta U = 0$; what will be ΔS ?

(b) Write second law of thermodynamics?

(c) Define State Variables.

Or

(a) The enthalpy of combustion of methane, graphite and dihydrogen at 298 K are -890.3 kJ mol⁻¹, -393.5 kJ mol⁻¹ and -285.8 kJ mol⁻¹ respectively. Enthalpy of formation of CH₄(g) will be?

Q7. (a) Why Boron shows anomalous behavior than remaining members of respective group.

(b) Define inert pair effect.

Q8. (a) How can you explain higher stability of BCl₃ as compared to TlCl₃?

(a) CO₂ is a gas while SiO₂ is a solid. Explain.

Q9. Explain Why?

(a) Why does methane not react with Cl₂ in dark?

(b) Is it possible to isolate pure conformation of an alkane?

(c) Which gas cannot be prepared by Wurtz reaction or Kolbe's electrolysis?

Q10. (a) Give the mechanism of Friedel and Crafts acylation.

(c) Give one example of Anti Markownikov's Rule.

Q11. (a) How will you convert ethanoic acid into benzene?

(b) Define Soda Lime

(c) Why is benzene extra ordinary stable though it contains three double bonds?

Or

(a) What is the product of ozonolysis of propene?

(b) Write Down Huckel Rules of Aromaticity?

SECTION C

Q12. Read the passage and answer the following questions:

The group 2 elements comprise beryllium, magnesium, calcium, strontium, barium and radium. They follow alkali metals in the periodic table. The alkaline earth metals are less reactive than alkali metals. The reactivity of alkaline earth elements increases on going

down the group. The alkaline earth metals dissolve in liquid ammonia to give deep blue-black solutions forming ammoniated ions.



Beryllium and magnesium are kinetically inert to oxygen and water because of the formation of an oxide film on their surface. However, powdered beryllium burns brilliantly on ignition in the air to give BeO and Be₃N₂. Calcium, strontium, and barium are readily attacked by air to form the oxide and nitride. All the elements except beryllium combine with hydrogen upon heating to form their hydrides, MH₂. Beryllium is used in the manufacture of alloys. Copper-beryllium alloys are used in the preparation of high strength springs. Metallic beryllium is used for making windows of X-ray tubes.

- (1) Why Beryllium and magnesium does not impart colour to the Bunsen burner flame.
- (2) Thermal decomposition of (NH₄)₂BeF₄ is the best route for the preparation of compound X. Give the formula of X.
- (3) Arrange the following elements in the increasing order of hydration enthalpy.

Be, Mg, Ca, Sr

- (4) What will be the colour of alkali metal in liquid ammonia at low and high concentration?
- (5) Explain why K prefer to form KO₂ and Na form Na₂O₂?