



JAIN COLLEGE, Bangalore
Mock Paper January - 2016
I PUC – Chemistry (34)

Time: 3 Hours 15 Minutes

Max. Marks: 70

Instructions:

1. The question paper has four parts A,B, C, and D. All the parts are compulsory.
2. Write balanced chemical equations and draw labelled diagrams wherever required.
3. Use log tables and simple calculators if necessary (Use of Scientific calculator is not allowed)

PART – A

I. Answer all the following questions: 10 × 1 = 10

1. Express in Scientific notation 0.0125
2. Name one intermolecular force present in HF.
3. What is the pH of 0.0001M HCl solution?
4. Write the IUPAC name of an element with atomic number 102.
5. Identify the type of redox reaction
$$\text{Zn(s)} + \text{CuSO}_4\text{(aq)} \rightarrow \text{ZnSO}_4\text{(aq)} + \text{Cu(s)}$$
6. Name a compound in which oxidation number of oxygen is +1.
7. Which alkali metal is strongest reducing agent?
8. Name the catalyst used in Friedel Craft's reaction.
9. Identify the functional group present in $\text{CH}_3\text{CH}_2\text{COCH}_3$
10. Draw the structure of the trans isomer of But-2-ene.

PART – B

II. Answer any FIVE of the following questions. 5 × 2 = 10

11. How many atoms of gold are present in 49.25g of gold (Atomic mass of gold = 197).
12. Define a) surface tension b) Boyle temperature.
13. What is Hydrogen bonding? Illustrate with an example.
14. How is plaster of paris prepared from gypsum? Give equation
15. Write any two differences between diamond and graphite.
16. Explain Wurtz reaction with an example.
17. How do you convert benzene to hexachlorobenzene ? Give equation
18. Mention any two gases which are responsible for greenhouse effect.

PART – C

III. Answer any FIVE questions 5 × 3 = 15

19. What is electron gain enthalpy? How does it vary along a period and down the group?.
20. Define Dipole moment.
21. Write any three differences between sigma and pi bond.
22. Based on molecular orbital theory, Write the electronic configuration of Lithium molecule and calculate bond order.
23. Balance the following equation by half reaction method.
$$\text{MnO}_4^- \text{(aq)} + \text{I}^- \text{(aq)} \rightarrow \text{MnO}_2\text{(s)} + \text{I}_2\text{(s)} \quad (\text{Basic})$$
24. a) Give the laboratory method of preparation of dihydrogen. Write the equation.[2+1]
b) Give one difference between hard water and soft water.
25. Give any three anomalous properties of Boron.
26. Write the chemical reaction that takes place during the manufacture of sodium hydroxide by Castner-kellner process.

PART – D

IV. Answer any FIVE of the following questions: 5 × 5 = 25

27. a) Chlorine is prepared in the laboratory by treating manganese dioxide (MnO_2) with aqueous HCl according to the reaction.



How many grams of HCl react with 5.0g of manganese dioxide?

(At. Mass of Cl = 35.5, Mn = 55, O = 16, H = 1)

b) Write two postulates of Dalton's atomic theory.

c) Carbon and oxygen combine to form carbon monoxide and carbon dioxide. Which law of chemical combination govern their formation? [2+2+1]

28. a) Write the significance of all quantum numbers.

b) State Hund's rule [4+1]

29. a) Describe Rutherford experiment. What are its conclusions?

b) Write de Broglie's equation [4+1]

30. a) Why do real gases deviate from ideal gas behaviour?

b) Calculate the value of R for one mole of an ideal gas in SI units.

c) Write van der Waals equation for 'n' mole of a gas. [2+2+1]

31. a) Explain Born-Haber cycle for the formation of one mole of NaCl

b) Distinguish between closed and isolated system. [3+2]

32. a) The equilibrium constant of a reaction at 298K is 73. Calculate the value of standard free energy change. $R = 8.314\text{J/K/mol}$

b) State Hess's law. Give its mathematical form

b) When is $\Delta H = \Delta U$ in a reaction? [2+2+1]

33. a) How will you show that an aqueous solution of CH_3COONa is basic in nature?

b) Explain Lewis concept of acids and bases.

c) Write the solubility product expression for BaCl_2 . [2+2+1]

34. a) State Le Chatelier's principle. What is the effect of temperature on the equilibrium.



b) Write the expression for equilibrium constant K_p for the reaction,



c) How is K_p related to K_c in the above equation?

V. Answer any TWO of the following **2 x 5 = 10**

35. a) State Markownikoff's rule and discuss the mechanism of addition reaction of hydrogen bromide to propene

b) How do you convert ethene to ethane? Give equation. [3+2]

36. a) Explain Carius method for the estimation of halogen present in organic compound.

b) How do you detect the presence of Carbon in an organic compound? [3+2]

37. a) What are the two criteria for a compound to show aromatic character?

b) What is the action of water on calcium carbide? Give equation.

c) What is functional group? [2+2+1]