



Jain College, Jayanagar
I PUC mock paper
Subject: Chemistry (34)

Duration: 3 hrs 15 minutes

Max. Marks: 70

PART –A

I. Answer ALL questions:

10X1=10

1. What is a mole?
2. Define compressibility factor.
3. Give the general electronic configuration of P-block elements.
4. How many valence electrons are present in Alkali metals?
5. What is Lindlar's catalyst?
6. Calculate the oxidation state of Cr in $K_2Cr_2O_7$.
7. Write the relation between K_p and K_c .
8. Mention the type of hybridization in graphite.
9. Write the bond line formula for 2-bromopentane.
10. What is an endothermic reaction?

PART-B

II. Answer any FIVE of the following questions. Each carries two marks.

5X2=10

11. How many significant figures are in 0.0021? How many seconds are there in two days?
12. State and explain Avogadro's law.
13. Write any two limitations of Octet rule.
14. Calculate $[H^+]$ of a solution whose pH is 8.8
15. Write the balanced chemical equations for reactions between:
i) $Ca(OH)_2$ and CO_2 ii) Li and O_2
16. Discuss the diagonal relation with an example.
17. How can the temporary hardness of water be removed by Clark's method.
18. What is biochemical Oxygen demand? What is its significance?

PART-C

III. Answer any FIVE of the following questions. Each carries Three marks.

5X3=15

19. Define electronegativity and explain how it varies along the period and down the group?
20. State any three postulates of VSEPR theory.
21. Write any three differences between sigma and pi bonds.
22. Write the energy level diagram for molecular orbital of Oxygen molecule and calculate its bond order and predict its magnetic property.
23. Balance the redox reaction by Oxidation number method. $Cr_2O_7^{2-} + SO_3^{2-} \rightarrow Cr^{3+} + SO_4^{2-}$
24. Write the chemical equations in the manufacture of sodium carbonate by Solvay process.
25. i) Mention any two differences between diamond and graphite.
ii) Write the chemical composition of producer gas. [2+1]
26. i) How is diborane prepared in the laboratory?
ii) Write the molecular formula of inorganic benzene. [2+1]

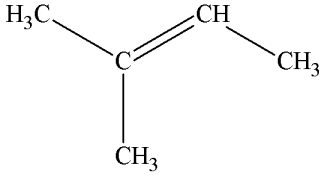
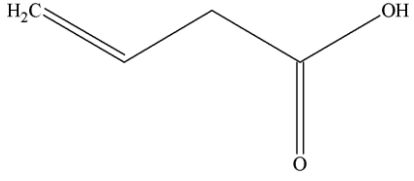
PART- D

IV. Answer any 5 questions. Each question carries 5 marks.

5×5=25

27. a) A compound on analysis was found to contain C=34.6%, H=3.85% and O=61.55%. Calculate its empirical formula.
b) Calculate the molarity of NaOH solution prepared by dissolving 4g in enough water to form 250 ml of the solution. **[3+2]**
28. a) Write any 3 postulates of Planck's quantum theory.
b) State and explain (n+l) rule with an example. **[3+2]**
29. a) Calculate the wavenumber of the first line in the Balmer series of hydrogen spectrum. (R=1.096×10⁷ m⁻¹)
b) Calculate the number of protons and neutrons in ⁵⁶Fe₂₆. **[3+2]**
30. a) Write any 3 deviations of real gas behaviour from ideal gas behavior.
b) Define surface tension. Write its SI unit. **[3+2]**
31. a) Explain the measurement of ΔU using bomb calorimeter.
b) 6 moles of an ideal gas at 27°C is compressed at constant temperature isothermally and reversibly from a volume of 5L to 10L by slowly increasing the external pressure. Calculate the maximum work done. (R=8.314JK⁻¹mol⁻¹ and log₁₀ 2= 0.3010) **[3+2]**
32. a) Explain extensive property with an example.
b) What is entropy? Give its unit.
c) Write the relation between C_p and C_v. **[2+2+1]**
33. a) Explain the concept of acids and bases using Lewis concept.
b) Define ionic product of water. Give its value at 298K.
c) Give the relation between dissociation constant and degree of dissociation. **[2+2+1]**
34. a) Using Le-Chatelier's principle explain the effect of temperature and pressure change for the reaction N₂(g) + 3H₂(g) ⇌ 2NH₃(g). ΔH = -92.4kJ.
b) Prove that pH + pOH = 14 at 298K. **[3+2]**

V. Answer any 2 questions. Each question carries 5 marks. 5×2=10

35. a) Explain the mechanism for chlorination of benzene.
b) Explain Markonikov's rule with an example. **[3+2]**
36. a) How is halogen estimated using Carius method?
b) Write the IUPAC names for the following. **[3+2]**
- i) 
- ii) 
37. a) Explain Wurtz reaction with an example.
b) Write the reactions for the ozonolysis of propene.
c) Mention the catalyst used in Friedel Craft's alkylation reaction. **[2+2+1]**
