

SARVODAYA PU COLLEGE, TUMKUR  
I PUC CHEMISTRY PRACTICE PAPER (For 2021-22 Academic year only)

**SUBJECT: CHEMISTRY**  
**TIME: 3.15MIN**

**SUBJECT CODE: 34**  
**MAX. MARKS: 70**

**INSTRUCTIONS:**

1. The question paper has four parts. All parts are compulsory.
2. a. Part-A carries 10 marks. Each question carries 1 mark.
- b. Part-B carries 10 marks. Each question carries 2 marks.
- c. Part-C carries 15 marks. Each question carries 3 marks.
- d. Part-D carries 35 marks. Each question carries 5 marks.
3. Write balance chemical equations and draw diagrams wherever necessary.
4. Use log tables and simple calculator if necessary (use of scientific calculator is not allowed).

**PART-A**

**I. Answer any ten of the following. Each question carries 1 mark. 10×1 = 10**

1. Express 100°C in kelvin.
2. What is a closed system?
3. State modern periodic law.
4. Mention one drawback of octet rule.
5. What is the oxidation number of carbon in CO<sub>2</sub>?
6. Name the radioactive isotope of hydrogen.
7. Give the composition of gypsum.
8. Which gas is liberated at cathode in Castner-Kellner cell?
9. What is the hybridization of carbon in fullerene?
10. Mention one use of zeolites.
11. Name an organic compound which is separated by distillation under reduced pressure.
12. Give an example for a heterocyclic organic compound.
13. Write the structure of cis-but-2-ene.
14. Name a gas responsible for greenhouse effect/global warming.
15. Give an example for harmful effects of depletion of ozone layer.

**PART-B**

**II. Answer any five of the following. Each question carries 2 marks. 5×2=10**

16. What are isotopes? How many neutrons found in  ${}_{17}^{37}\text{Cl}$ .
17. State first law of thermodynamics. Give its mathematical form.
18. Give the general outermost electronic configuration of (i) alkali metals (ii) halogens.
19. Define dipole moment. What is the unit of it?
20. Write any two differences between sigma and pi bonds.
21. Define oxidation and reduction in terms of electron transfer.
22. Complete the following equation:

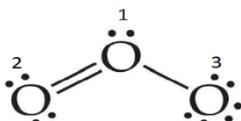


23. Illustrate +E effect with an example.
24. How is ethyne converted into benzene? Write equation.
25. What are the components of photochemical smog?

**PART-C**

**III. Answer any five of the following. Each question carries 3 marks. 5×3=15**

26. Define electronegativity. How does it vary in a period & down a group in the periodic table?
27. Explain hybridization of beryllium in BeCl<sub>2</sub>. What is the shape and bond angle?
28. Calculate the formal charges of oxygen atoms in ozone:



29. Write the electronic configuration of He<sub>2</sub> molecule. calculate its bond-order.
30. Balance the following equation (in acidic medium)  $\text{Cr}_2\text{O}_7^{2-}(\text{aq}) + \text{SO}_3^{2-}(\text{aq}) \longrightarrow \text{Cr}^{3+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq})$
31. (i) Mention a method of removing permanent hardness of water. (ii) How is H<sub>2</sub>O<sub>2</sub> prepared from barium peroxide?
32. Describe any three points of similarity between Li and Mg.

33. Give the equations for the reactions involved on Solvay process of preparation of washing soda.
34. (i) What is the formula of inorganic benzene?  
 (ii) Write structure/formula of repeating unit of organo silicon polymers.
35. Give reasons for the electrical conductivity and slippery nature of graphite.

#### PART-D

#### IV. Answer any five of the following. Each question carries 5 marks. 5×5=25

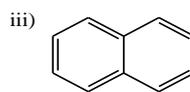
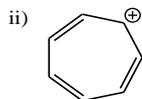
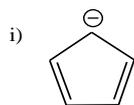
36. (a) State the law of multiple proportions. Give an example for this law.  
 (b) Define 'mole'.
37. (a) The percentage composition of organic compound found to contain 39.9% carbon, 6.7% hydrogen and the rest is oxygen. If the molar mass of compound is  $60\text{g mol}^{-1}$ , Determine the molecular formula of the compound. (Atomic mass of C, H and O are 12, 1 and 16 respectively).  
 (b) Express 0.0456 in scientific notation. How many significant figures are in it?
38. (a) State the postulates of Bohr's model for an atom.  
 (b) Give the mathematical form of Heisenberg's uncertainty principle & explain the terms.
39. (a) Mention one significance each for principal, azimuthal and magnetic quantum numbers.  
 (b) The outer electronic configuration of Cr is  $3d^5 4s^1$  and not  $3d^4 4s^2$ , why?
40. (a) Give two examples of intermolecular forces.  
 (b) Write van der Waal's equation for 'n' mole of a real gas and identify the van der Waal's constants.
41. (a) State Boyle's law and give its mathematical form.  
 (b) mention the conditions at which a real gas behaves like ideal gas.  
 (c) what is the unit of surface tension?
42. (a) 2 liters of an ideal gas undergoes isothermal irreversible expansion until its final volume is 10 liters, against a constant pressure of 1 atm. Calculate the work done.  
 (b) State Hess's law. Explain with an example
43. (a) Calculate the standard enthalpy of formation of methanol,  $\text{CH}_3\text{OH}$ . Given: the standard enthalpies of combustion of carbon, hydrogen and methanol are  $-393\text{kJ}$ ,  $-286\text{kJ}$  &  $-726\text{kJ}$  respectively.  
 (b) Give the relation between Gibbs energy, enthalpy and entropy. If  $\Delta G < 0$ , predict whether the reaction is spontaneous or non-spontaneous.
44. (a) At equilibrium the concentrations of  $\text{N}_2 = 3 \times 10^{-3}\text{M}$ ,  $\text{O}_2 = 4 \times 10^{-3}\text{M}$  &  $\text{NO} = 2 \times 10^{-3}\text{M}$  at 800K. Calculate the  $K_c$  for the following reaction.



- (b) Discuss the effect of low temperature and catalyst on the following equilibrium, according to Lechatelier's principle.



45. (a) What is meant by conjugate acid-base pair? What is the conjugate base of HCl?  
 (b) Show that  $[\text{H}^+][\text{OH}^-] = K_w$
46. (a) Calculate the pH of a solution containing  $10^{-2}$  mole per liter of  $\text{H}^+$  ions.  
 (b) Define 'buffer'. Give an example for a buffer which can maintain  $\text{pH} < 7$ .
- V. Answer any two of the following. Each question carries 5 marks. 2×5=10**
47. (a) Explain the principle and formula used in Carius process of estimation of sulphur.  
 (b) What are position isomers? Give examples with formula  $\text{C}_3\text{H}_8\text{O}$ .
48. (a) How many sigma and pi bonds are present in:  $\text{HC}\equiv\text{C}-\text{CH}=\text{CH}-\text{CH}_3$ ?  
 (b) Write the IUPAC name of  $\text{CH}_3\text{CH}_2\text{COCH}_3$ . Name the functional group in it.
49. (a) State and explain Markovnikov's rule with an example.  
 (b) Give an example for a substitution reaction given by methane.
50. (a) Write equation for Friedel-Crafts alkylation of benzene.  
 (b) Identify the non-benzenoid and benzenoid aromatic compounds in the following:



**NOTE: Students must practice the model question paper published by DPUE as priority. This practice paper is being circulated to SARVODAYA PU COLLEGE, TUMKUR, students so that they can practice a greater number of most likely questions.**