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FOR KARNATAKA CLASS 11 PREPARATION

Karnataka 1st PUC Model Question Paper 2027 for Chemistry (Paper 1)

EXAM	YEAR	TYPE	SUBJECT
Karnataka Class 11	2027	Sample Paper	Chemistry

GOVERNMENT OF KARNATAKA
DEPARTMENT OF SCHOOL EDUCATION (PRE-UNIVERSITY)
2026-27 I PUC MODEL QUESTION PAPER – 1

Subject: Chemistry (34) **Maximum Marks: 70** **Time: 3.00 Hours** **Number of Questions: 48**

Instructions:

1. Question paper has FIVE parts. All parts are compulsory.
2. a. Part-A carries 20 marks. Each question carries 1 mark.
   b. Part-B carries 10 marks. Each question carries 2 marks.
   c. Part-C carries 18 marks. Each question carries 3 marks.
   d. Part-D carries 10 marks. Each question carries 5 marks.
   e. Part-E carries 12 marks. Each question carries 4 marks.
3. In Part-A questions, **first attempted answer** will be considered for awarding marks.
4. Write balanced chemical equations and draw neat labelled diagrams and graphs wherever necessary.
5. Direct answers to the numerical problems without detailed steps and specific unit for final answer will not carry any marks.
6. Use log tables and simple calculator if necessary (use of scientific calculator is not allowed).
7. For a question having circuit diagram/figure/ graph/ diagram, alternate questions are given at the end of question paper in a separate section for visually challenged students.

PART-A

I. Select the correct option from the given choices: **15 × 1 = 15**

1. The environmentally hazardous refrigerant responsible for ozone depletion in the stratosphere is
   (a) CFCs (b) methane (c) ice (d) water vapours
2. If two volumes of gas give one volume of $A_{2(g)}$ and one volume of $B_{2(g)}$, then the molecular formula of the gas is (i) A_2B_2 (ii) A_4B_4 (iii) AB
   (a) only (i) (b) only (iii) (c) both (i) and (ii) (d) only (ii)
3. Number of electrons present in the outer shell of the most stable atoms is _____.
   (a) 18 (b) 8 (c) 1 (d) 10
4. Which of the following is a pair of isotopes?
   (a) $^{13}_{6}X$ and $^{14}_{7}X$ (b) $^{14}_{6}X$ and $^{13}_{7}X$ (c) $^{14}_{6}X$ and $^{13}_{6}X$ (d) $^{14}_{6}X$ and $^{14}_{7}X$
5. The atomic and ionic radii of chlorine atom and chloride (Cl^-) ion respectively (in pm):
   (a) 99 and 167 (b) 167 and 99 (c) 99 and 99 (d) 186 and 90
6. According to IUPAC nomenclature, a newly discovered element has been named Uun. The atomic number of the element is
   (a) 111 (b) 112 (c) 109 (d) 110
7. The percentage of s-character of the hybrid orbitals in methane and ethyne are respectively:
   (a) 10 and 50 (b) 25 and 50 (c) 50 and 75 (d) 25 and 75
8. The second law of thermodynamics introduced the concept of:
   (a) enthalpy (b) work (c) entropy (d) internal energy
9. If a catalyst is used in a reversible reaction, then the
   (a) backward reaction becomes faster (b) forward reaction becomes faster
   (c) equilibrium constant decreases (d) equilibrium is attained more quickly

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10. The oxidation number of phosphorus in H_3PO_2 is

(a) + 1 (b) 0 (c) -1 (d) +2

11. The redox reaction: $Mg\,(s) + 2H_2O\,(l) \longrightarrow Mg(OH)_2\,(s) + H_2\,(g)$; is an example of

(a) combination reaction (b) displacement reaction
(c) disproportionation reaction (d) decomposition reaction

12. Which of the following chemical species acts as an electrophile?

(a) BF_3 (b) NH_3 (c) H_2O (d) Cl^-

13. Methoxy methane and ethyl alcohol are examples of

(a) position isomers (b) chain isomers (c) functional isomers (d) metamers

14. According to Markownikoff's rule, when hydrogen halide adds to an unsymmetrical alkene, the hydrogen of HX attaches to

(a) carbon at the end of the molecule
(b) carbon with least number of hydrogen atoms
(c) carbon in the middle of the molecule
(d) carbon with maximum number of hydrogen atoms

15. Which of the following hydrocarbons damage DNA and cause cancer in the human body?

(a) 1,2-Benzanthracene (b) 1,2-Benzpyrene (c) all of these (d) 3-Methylcholanthrene

II. Fill in the blanks by choosing the appropriate word from those given in the brackets: 5 × 1 = 5

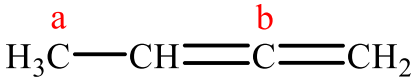
(Absorbed, Evolved, increased, ionic, nucleus, urea)

16. Rutherford's α-particle scattering experiment established the existence of a small, dense _____ at the centre of the atom.
17. The bond formed between two atoms having high electronegativity difference is called _____ bond.
18. In an exothermic reaction, heat is _____.
19. When the pH of a solution decreases, its hydrogen ion concentration is _____.
20. An organic compound formed from an inorganic compound ammonium cyanate is _____.

PART – B

III. Answer any FIVE of the following. Each question carries two marks. 5 × 2 = 10

21. Give two properties of electromagnetic radiations
22. Give any two limitations of the octet rule.
23. Define dipole moment. What is its unit?
24. Define state functions. Give an example.
25. Write Gibbs equation to give the relation between free energy change, enthalpy change and entropy change.
26. Explain the Common ion effect. Give an example.
27. Write the relation between solubility and solubility product (Ksp) for an AB_2 type of salt.
28. Mention the hybridisation of carbon atoms marked as a and b in the following compound.



29. Suggest a suitable method for separating glycerol from spent lye and explain the reason for your choice.
30. What happens to the boiling point of isomeric alkanes with an increase in branching? Give reason.

PART – C

IV. Answer any THREE of the following. Each question carries three marks. 3 × 3 = 09

31. Define electronegativity of an element. How does it vary along a period and down a group in the periodic table?
32. Explain the shape of the ammonia molecule using VSEPR theory.
33. Define the following terms: (a) Lattice enthalpy (b) Bond angle (c) Bond enthalpy

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34. Give any three differences between sigma and pi bonds.
35. Balance the chemical equation by the oxidation number method: $Fe + HCl \longrightarrow FeCl_3 + H_2$.

V. Answer any THREE of the following. Each question carries three marks. **3 × 3 = 09**

36. Write any three postulates of Dalton's atomic theory.
37. Write the significance of any three quantum numbers.
38. Derive the relationship between Cp and Cv for an ideal gas.
39. Write any three characteristic properties of equilibrium.
40. Derive the Henderson-Hasselbalch equation for acidic buffer.

PART – D

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

41. With a neat labelled diagram, explain the principle and calculations involved in the estimation of carbon in the organic compound.
42. (a) Write the equation for the mechanism of chlorination of methane.
    (b) Explain the Wurtz reaction with a suitable example. (3+2)
43. (a) Explain the directive Influence of nitro and methyl groups in a monosubstituted benzene towards electrophilic substitution reactions.
    (b) Define polymerization. Mention any one use of polyethyne (polyacetylene). (3+2)

PART–E

(NUMERICAL PROBLEMS)

VII. Answer any THREE of the following. Each question carries four marks. **3 × 4 = 12**

44. An iron oxide compound contains 69.9% Iron, and 30.1% oxygen. The molecular mass of the compound is 160 $gmol^{-1}$. Find molecular formula. (Atomic mass of iron & oxygen are 55.85u & 16u respectively)
45. Yellow light emitted from a sodium lamp has a wavelength of 580 nm. Calculate the a) frequency b) wave number.
46. Calculate the total work done when one mole of a gas expands isothermally and reversibly from an initial volume of 10 dm^3 to a final volume of 20 dm^3 at 298 K. (R = 8.314 JK^{-1} mol^{-1})
47. Calculate ΔG^0 for the hydrolysis of sucrose. The equilibrium constant K_C is 2×10^{-3} at 300 K. (R = 8.314 J K^{-1} mol^{-1})
48. In Carius method of estimation of sulphur, 0.466 g of barium sulphate was formed from 0.32 g of organic compound. Calculate the percentage of sulphur. (Given atomic mass of S = 32 u and molar mass of barium sulphate = 233 g mol^{-1}.

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