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FOR KARNATAKA CLASS 11 PREPARATION

# Karnataka 1st PUC Model Question Paper 2027 for Chemistry (Paper 2)

| 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 – 2**

**Subject: 34 - Chemistry** **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 number of significant figures in 0.523 is

   (a) 3 (b) 4 (c) 2 (d) 1

2. Molarity is defined as the number of moles of solute dissolved in

   (a) one liter of solution (b) one liter of solvent (c) one kg of solution (d) one kg of solvent

3. An atom of an element contains 15 electrons and its nucleus has 17 neutrons. The mass number of this atom is

   (a) 17 (b) 32 (c) 02 (d) 15

4. The chemical properties of atoms are controlled by number of

   (a) nucleus (b) protons (c) electrons (d) neutrons

5. The scientist who classified elements into groups of three called triads was:

   (a) Alexander Newlands (b) Johann Dobereiner (c) Lothar Meyer (d) Dmitri Mendeleev

6. Which of the following atoms is isoelectronic with a fluoride ion?

   (a) neon (b) sodium (c) oxygen (d) fluorine

7. The conversion of $O_2 \longrightarrow O_2^+$ involves removal of an electron from:

   (a) antibonding $\pi^*_{2p}$ orbital (b) bonding $\pi_{2p}$ orbital

   (c) bonding $\sigma_{2p}$ orbital (d) antibonding $\sigma^*_{2p}$ orbital



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8. The example for intensive property is

(a) internal energy (b) temperature (c) enthalpy (d) heat capacity

9. "Energy of universe is conserved but entropy of universe always increases during any natural process". The statement is based on:

(a) Faradays laws (b) 3rd law of thermodynamics

(c) 1st and 2nd law of thermodynamics (d) Zeroth law of thermodynamics

10. **Statement - 1:** Equilibrium is possible only in a closed system at a given temperature.

**Statement - 2:** At equilibrium, all measurable properties of the system remain constant.

Identify the correct statement

(a) Both statement 1 and 2 are correct (b) Statement 1 is correct and statement 2 is incorrect.

(c) Both statement 1 and 2 are incorrect (d) Statement 1 is incorrect and statement 2 is correct.

11. Match the following elements in compounds with their oxidation state:

| Element | Oxidation state |
|---|---|
| A) Oxygen in potassium superoxide | i) +1 |
| B) Hydrogen in metal hydrides | ii) - ½ |
| C) Sodium in rock salt | iii) -2 |
| D) Sulphur in hydrogen sulphide | iv) -1 |

(a) A) → i); B) → ii); C) → iii); D) → iv) (b) A) → ii); B) → iv); C) → i); D) → iii)

(c) A) → ii); B) → iii); C) → i); D) → iv) (d) A) → iii); B) → iii); C) → i); D) → ii)

12. Which of the following will not show resonance?

(a) $C_6H_6$ (b) $C_6H_{12}$ (c) $CH_3NO_2$ (d) $C_6H_5COO^-$

13. The property catenation is more marked in the case of

(a) silicon (b) carbon (c) tin (d) copper

14. The carbon atoms in benzene are

(a) $sp^2$ hybridized (b) $sp$ – hybridized (c) $sp^3$ – hybridised (d) unhybridised

15. Which of the following reagents will produce trans alkenes through the reduction of alkynes?

(a) $H_2$/Pt (b) $H_2$/Pd (c) $H_2$/Ni (d) Na /liquid $NH_3$

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

**(-$CH_2$-, weak base, zero, - $CH_3$, Helium, Fluorine)**

16. The element _____ was discovered in the sun by spectroscopic method.

17. The valency of the noble gases is _____.

18. If a Bronsted acid is a strong acid then its conjugate base is a _____.

19. If an element X has the same oxidation state in all of its compounds, then element X is _____.

20. In a homologous series of aliphatic hydrocarbons, successive members differ from each other in their molecular formula by a _____ group.

## PART – B

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

21. State Heisenberg's Uncertainty Principle. Mention one significance of this principle.
22. Mention two factors that determine the percentage covalent character in an ionic bond.
23. Mention the shape of $SO_2$ molecule. Why is the bond angle of $SO_2$ slightly less than 120° (approximately 119°)?
24. Define entropy. What happens to the entropy when liquid changes into a vapour?
25. What is extensive property? Give an example.
26. What is a buffer solution? Give an example for acidic buffer.
27. State Le Chatelier's principle. What is the effect of temperature on equilibrium if the reaction is exothermic?
28. Give any two differences between the inductive effect and the electromeric effect.
29. Among primary, secondary and tertiary carbocations, which is the most stable? Give reasons.
30. Explain Ozonolysis of alkenes with an example.

## PART – C

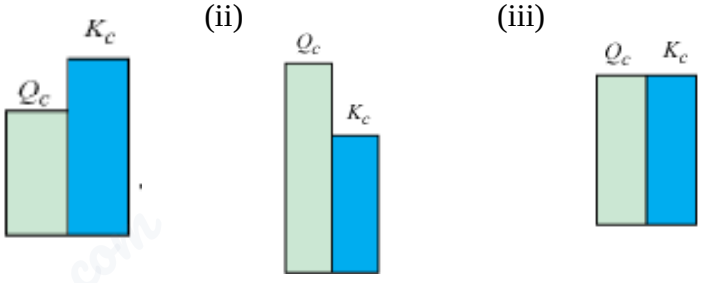
**IV. Answer any THREE of the following. Each question carries three marks.** **3 × 3 = 09**

31. Define ionization enthalpy. Mention any two factors affecting ionization enthalpy.
32. Calculate the formal charge on each oxygen atom present in ozone.
33. Based on MOT, write the electronic configuration, bond order & the magnetic property of lithium molecule.
34. Define a hydrogen bond. Mention its types.
35. Define redox reactions. Explain the oxidizing agent and reducing agent in terms of electron transfer.

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

36. Mention the different scales of measuring temperature.
37. Write three conclusions regarding atomic structure based on Rutherford's atomic model.
38. Draw the Born-Haber Cycle used to calculate the lattice enthalpy of NaCl.
39. Plot a graph of concentration vs time, for the attainment of chemical equilibrium in the reversible reaction: $H_2(g) + I_2(g) \rightleftharpoons 2HI\ (g)$ from either direction. Identify the equilibrium position on the graph.
40. For the following figures, predict the direction of the reaction.

(i) (ii) (iii)






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## PART – D

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

41. (a) Explain the test for the detection of halogen using Sodium fusion extract. (3+2)

(b) Write the bond-line structure formula for 3-chlorooct-5-enal. Identify the functional group in it.

42. (a) Complete the following reactions

(i) $2CH_4 + O_2 \xrightarrow{Cu/523K/100\ atm}$

(ii) $CH_4 + O_2 \xrightarrow{Mo_2O_3/\Delta}$

(iii) $2CH_3 - CH_3 + 3O_2 \xrightarrow{(CH_3COO)Mn/\Delta}$

(b) Explain Reforming reaction with a suitable example. (3+2)

43. (a) Explain the mechanism of the nitration of benzene.

(b) Draw the staggered conformation of ethane. (3+2)

## PART–E

## (NUMERICAL PROBLEMS)

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

44. Naturally occurring chlorine consists of two isotopes with atomic weights 34.97 and 36.97 and their abundance 75.8% and 24.2% respectively. Calculate the average atomic mass of chlorine.

45. Calculate the wave length of moving electron whose kinetic energy is 3.0 x $10^{-25}$ J. [Given: Mass of electron = $9.1094 \times 10^{-31}$ kg ]

46. The combustion of one mole of benzene at 298 K and 1 atm liberates 3267.0 kJ of heat. Calculate the standard enthalpy of formation ( $\Delta H^o_f$ ) of benzene. Standard enthalpies of formation of $CO_2(g)$ and $H_2O(l)$ are –393.5 kJ $mol^{-1}$ and – 285.83 kJ $mol^{-1}$ respectively.

47. Calculate the pH of 0.08M solution of hypochlorous acid, HOCl. The ionization constant of the acid is $2.5 \times 10^{-5}$. Determine the percent dissociation of HOCl.

48. On complete combustion 0.246 g of an organic compound gave 0.198g of carbon dioxide and 0.101g of water. Determine the percentage composition of carbon and hydrogen in the compound.

## PART–F

## (For visually challenged students only)

40. Write the relationship between dissociation constant of acid and its conjugate base. Give the importance of these two. (3)

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