

Department of Chemistry  
VTMNSS College, Dhanuvachapuram

Semester I B.Sc. Chemistry

CH 1141 Inorganic Chemistry I

Question Bank

Questions (2 Marks)

1. Give the limitations of Bohr model of atom.
2. Define photochemical smog with example.
3. What is eutrophication? What is the reason for eutrophication?
4. What is greenhouse effect? Name two greenhouse gases.
5. Explain the Lowry-Bronsted concept of acid and base.
6. Define Aufbau principle.
7. IE decreases on moving from Li towards CE. Why?
8. Define diagonal relationship with example.
9. Explain the dual nature of matter.
10. State and explain Pauli's Exclusion principle.
11. Write a brief note on heavy water.
12. Explain nascent hydrogen.
13. The +1 oxidation state of alkali metals are quite stable. Explain.

14. Give the trend in the order of electronegativity of alkali metals and alkaline earth metals while going down a group.
15. Explain the SHAB concept with example.
16. How acid rain is produced?
17. What is the ozone layer and why it is important?
18. Give de-Broglie equation and explain the terms.
19. What are the isotopes of hydrogen? Mention one uses each.
20. Explain inert pair effect.
21. Compare the thermal stability of various oxides of nitrogen.
22. Define Lux-Flood concept of acids and bases with examples.
23. Mention any two adverse effects of plastic materials to soil.
24. Graphite is used as a dry lubricant in machines. Why?
25. Give an account of conjugate acid-base pairs.
26. Write the time independent Schrodinger equation and explain the terms.
27. Distinguish between an orbit and an orbital.
28. How do industrial effluents pollute water?
29. Alkali metals in liquid ammonia are coloured. Why?
30. State Slater's rule and mention its significance.
31. For an orbital with Principal quantum number  $n=3$ , write down all the possible values of azimuthal quantum numbers and the magnetic quantum numbers for each.
32. Write one method (with equation) for producing tritium.
33. What do you mean by hardness of water? How will you remove temporary hardness?
34. Write any two uses of alkali metals.
35. What are the harmful effects of fireworks?

36. Write a note on agricultural pollutants.
37. What is Hund's rule? Explain with example.
38. What are gypsum and plaster of paris?
39. What are ortho and para hydrogen?
40. What is meant by wave function? What is its significance?
41. Draw the shape of  $d_{x^2-y^2}$  orbital.
42. Write a short note on allotropes of carbon.
43. What are the factors influencing electronegativity?
44. Write the difference between S and P block elements.
45. What is green house effect?
46. Explain the significance of  $\Psi$  and  $\Psi^2$
47. Explain B.O.D., C.O.D. and D.O.
48. Calculate the wavelength of electron moving with a velocity of  $10^6 \text{ ms}^{-1}$ .
49. 12. A cricket ball weighing 100g is to be located within  $0.1 \text{ \AA}$ . What is the uncertainty in its velocity?
50. What are eigen values and eigen functions?
51. How first element differs from other elements in a group?
52. What is COD? 16. What are ortho and para hydrogens.
53. Write SHAB principle?
54. Comment about the hydration of alkali metals?
55. 19. State and illustrate Pauli's Exclusion Principle.
56. Distinguish between levelling solvents and differentiating solvents.
57. Write a note on green house effect. 22. What is acid rain?
58. Mention about the flame colouration of II group elements.

59. Write an example of classic smog.
- 60 State Heisenberg's uncertainty principle.
- 70 What are matter waves?
- 71 Which is the conjugate base of HF.
- 72 Define covalent radius.
- 73 Write the reason for eutrophication.
- 74 In the stratosphere, fluorine from the CFC's change to which compound
- .75 Name the radio isotope of hydrogen?
76. Mention any one use of alkali metals.

## Questions (4 Marks)

1. Differentiate between persistent and non persistent pollutants.
2. Draw the atomic structure of hydrogen and write a note of hydrogen as a next generation fuel.
3. State and explain Heisenberg's uncertainty principle.
4. Describe the Davisson and Germer experiment to verify the wave nature of electrons.
5. Discuss Arrhenius and Lux-flood concepts of acids and bases.
6. What is smog? Explain the adverse effects caused by smog.
7. What are the different quantum numbers?
8. Discuss the anomalous behavior of Beryllium among alkaline earth metals.
9. Write a short note on the management of air pollution.
10. Explain the leveling effect with an example.
11. What is heavy water? How does it differ from hard water.
12. Describe the method of preparation of ortho and para hydrogen.

13. Briefly explain BOD and COD and its significance.
14. Write a note on classic and photochemical smog.
15. Compare the solubility and stabilities of alkaline earth metal sulphates.
16. Give an account of cesium in photo voltaic cell and lithium battery.
17. Discuss the duties and responsibilities of Pollution Control Board.
18. Discuss the Hund's rule of maximum multiplicity with a suitable illustrative example.
19. Distinguish between matter waves and electromagnetic waves.
20. Explain the extra stability associated with half filled and completely filled electronic configurations.
21. Derive the expression for radius and energy of an atom according to Bohr model.
22. Write about the factors that influence the ionization enthalpy.
23. Explain the significance of the Heisenberg Uncertainty Principle.
24. What are the limitations of Bohr atom model?
25. Write a note on Pauling's electronegativity scale.
26. Write a note on Mulliken's electronegativity scale and Alred and Rochow electronegativity scale.
27. Draw the radial distribution curves for 2s and 3s orbitals.
28. Draw the shape of d and p orbitals.
29. Derive an expression for the frequency of spectral lines in Hydrogen spectra.
30. Discuss the following reactions in liquid SO<sub>2</sub> . (i) Solvation (ii) acid- base reaction
31. Discuss hydrogen and water gas as fuels.
32. Describe reverse osmosis for water purification.
33. Briefly explain about the Davisson and Germer's experimental verification of wave nature of electron.
34. What is smog? What are the different types of smog?

35. How ozone layer is depleted?

36. What is the trend of ionization enthalpy and electron gain enthalpy in the periodic table?

37. What are hydrides? Explain.

38. Discuss about the redox property of alkali metals

39. Explain the four concepts of acids and bases and its limitations.

40. Explain Hardness of water and the different types

## Questions (15 Marks)

1. Explain

a) acid rain

b) COD and BOD

c) Smog

d) Short note on pollution control board, their duties and responsibilities.

2. Describe

a) Rutherford model of atom and its limitations

b) Bohr theory of atom and its limitations

3. Discuss briefly

a) Explain electro dialysis for water treatment.

b) Distinguish between temporary and permanent hardness.

c) Write the uses of the isotopes of hydrogen.

4. a) Brief about barium x-ray.

b) Discuss the application of Se and Xerography.

c) Give a brief account of oxoacids of halogen.

5. Illustrate any five applications of Slater's rule.
- 6.a) Explain Gold-foil experiment for the detection of nucleus
- b) Describe Rutherford's atom model
- c) What are the limitations of Rutherford's atom model?
7. Write an essay on various electronegativity scales.
8. What is periodicity? Explain how Electron affinity, ionization enthalpy, electronegativity, size of the atoms vary across the periodic table.
- 9 a) Describe the Davisson and Germer experiment to verify the wave nature of electrons.
- b) Explain the origin of Hydrogen spectra using the Bohr model of atoms.
10. Discuss Bohr atom model. What are its merits and demerits? How was it successful in explaining the H-spectra.
11. Write an essay on the sources of water pollution and methods to control it.
12. a) Describe the methods to purify industrial waste water.
- b) Explain the pollution caused by plastics. What are the measures that can be taken to control plastic pollution
- 13.(a) What is effective nuclear charge? Explain with the example. (b) Write a note on various electronegativity scales (c) Explain about the various rules for filling up of electrons in orbitals.
- 14(a) Write a note on allotropes of carbon. (b) Discuss on the topic 'hydrogen as next generation fuel' (c) Give an account of Cesium in photo voltaic cell and Lithium battery
- 15(a) What are the common characteristics of solvents? (b) Liquid ammonia is a better solvent for organic compounds. Why? (c) Write a note on various concepts of acids and bases.
- 16.(a) Briefly discuss about the various air pollutants (b) Fertilizers and pesticides pollute soil. Justify. (c) Explain about the various water quality parameters.
17. Discuss the use of liquid HF and liquid SO<sub>2</sub> as a solvent for various chemical reactions.

18. Write an essay on the various environmental movements in India.

19. a) Explain the use of liquid ammonia as a non aqueous solvent.

b) Discuss about plastics and their misuses

20. a) What is Air Pollution? How can air pollution be minimized?

b) Explain the use of Li in lithium battery, cesium in photovoltaic cells, selenium in xerography and barium x-ray.

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