

Reg. No. : .....

Name : .....

**Fifth Semester B.Sc. Degree Examination, December 2022**

**First Degree Programme Under CBCSS**

**Chemistry**

**Open Courses**

**CH 1551.2 : FUNDAMENTALS OF CHEMISTRY AND ITS APPLICATION TO  
EVERYDAY LIFE**

**(2020 Admission)**

**Time : 3 Hours**

**Max. Marks : 80**

**SECTION – A**

Answer in a word/sentence Answer **all** questions.

1. Who is the father of modern chemistry. \_\_\_\_\_
2. The charge of an electron is approximately \_\_\_\_\_
3. The maximum number of electrons that can be occupied in main shell 'K' is  
\_\_\_\_\_
4. The relative mass of a proton is \_\_\_\_\_
5. Define periodicity.
6. Across a period from left to right, metallic character \_\_\_\_\_
7. Diamond is an excellent \_\_\_\_\_ (electric/thermal) conductor.
8. The structure of water molecule is \_\_\_\_\_
9. Moth balls are chemically \_\_\_\_\_
10. The most common adulterant in milk is \_\_\_\_\_

**(10 × 1 = 10 Marks)**

**P.T.O.**

## SECTION – B

Each question carries two marks (Short answer type) Answer any eight questions.

11. Write notes on the contributions by Robert Boyle in the evolution of chemistry.
12. What were John Dalton's postulates on atom?
13. Write notes on Thomson's model of atom. What were its disadvantages?
14. Explain Aufbau principle.
15. Give any two examples for isotopes.
16. An element X in the periodic table belongs to group I. The formula of its chloride will be \_\_\_\_\_.
17. Metalloids are generally present in which block of the periodic table? Write any one example for a metalloid.
18. Define electronegativity.
19. Draw the chemical structure of poly(ethene).
20. What are the major ingredients in tooth paste? Write each of its function.
21. What are the major ingredients in hair shampoo?
22. What is the mechanism of hair dye? Write any one of its disadvantage.
23. What are NPK fertilizers? How does it improve plant health?
24. Write notes on the general properties of alkaline earth metals.
25. What are the main adulterants present in pulses?
26. Write notes on adulteration using a suitable example.

(8 × 2 = 16 Marks)

## SECTION – C

Each question carries four marks (Short essay type) Answer any six questions.

27. What is the role of chemistry in modern era? In what all ways does it help mankind?
28. Write notes on ancient speculations on the concept of atom.
29. Draw the atomic structures of nitrogen and fluorine atom.
30. Illustrate Rutherford's model of atom? What were its advantages and disadvantages?
31. How does reactivity vary across a period? Give reason.
32. How is the periodic table arranged? What are its salient features?

33. What are inert gases? To which group do they belong? What are their salient features?
34. Write notes on super phosphates used in fertilizer industry.
35. What are the major chemicals present in soaps and detergents? What are their functions?
36. What are the possible hazards of careless use of explosives?
37. Compare the structures of diamond and graphite. How does the structural variation bring difference in properties of diamond and graphite?
38. Write notes on artificial sweetening agents.

(6 × 4 = 24 Marks)

#### SECTION – D

Answer **any two** questions. **Each** question carries **15** marks.

39. (a) How does effective nuclear charge vary across a period? How does it influence reactivity of elements?
- (b) How does metallic character vary down the group. Illustrate.
- (c) Illustrate the variation of electronegativity across a period and down the group.

(3 × 5 = 15 Marks)

40. (a) Draw the electron dot structures of (i). Water, (ii). Carbon dioxide, (iii). Methane and (iv). Iodine.

(4 × 2 = 8 Marks)

- (b) Draw the structural arrangement of silicon dioxide in sand. 3
- (c) Differentiate ionic and covalent bonding using suitable examples. 4
41. (a) Define Bohr's model of atom. What were its main advantages. 9
- (b) Using Bohr's model, draw the structures of Hydrogen, Helium and Neon atom with the number of electrons, protons and neutrons. 6

42. (a) What are the common ways of adulteration in (i). Milk, (ii). Ghee, (iii). Oil, (iv). Chilli powder and v). Asafoetida?

(5 x 2 = 10 Marks)

- (b) Write any two ways by which adulteration can be detected. 2  
(c) Write a note on food preservatives. 3

43. (a) Draw the atomic structures of (i). Nitrogen, (ii). Fluorine and (iii). Neon atoms.

(3 x 2.5 = 7.5 Marks)

- (b) Write the sub-shell electronic configurations of (i). Sodium (atomic number = 11), (ii). Aluminium (atomic number = 13) and (iii). Argon (atomic number = 18).

(3 x 2.5 = 7.5 Marks)

44. (a) Write notes on the chemicals present in soft drinks. What are its health hazards? 5

- (b) Write notes on chemicals present in artificial sweetening agents. 5

- (c) Write notes on ingredients present in hair dye. 5

(2 x 15 = 30 Marks)