

**FIRST SEMESTER (CBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2020**

Chemistry

CHE 1B 01—THEORETICAL AND INORGANIC CHEMISTRY—I

(2019 Admissions)

Time : Two Hours

Maximum: 60 Marks

Section A (Short Answers)

Answer at least eight questions.

Each question carries 3 marks.

All questions can be attended.

Overall Ceiling 24.

1. How does inferential approach differ from experimental approach in research ?
2. List out the major international publishers in chemical sciences.
3. What is PPE ? What are the general contents in it ?
4. Distinguish between mean and median.
5. What are the major limitations of the HSAB concept ?
6. Compare the relative basic character of alkali metal hydroxides with alkaline earth metal hydroxides.
7. Why is Borazine named as inorganic Benzene ?
8. Draw the structure of $AlCl_3$ and substantiate its acidic character.
9. How is electronegativity assessed by Pauling's scale ?
10. State Fajan's rule.
11. What is Group displacement law ?
12. How do radioactive tracers help to study the reaction mechanism of ester hydrolysis ?

(8 × 3 = 24 marks)

Turn over

Section B (Paragraph)

Answer at least five questions.

Each question carries 5 marks.

All questions can be attended.

Overall Ceiling 25.

13. Describe the hypothesis - experiment - theory route of scientific method ?
14. Calculate the : (a) Normality ; and (b) Molarity of sulphuric acid solution prepared by dissolving 13.3 mL of sulfuric acid in 500 mL water (specific gravity for concentrated sulfuric acid is about 1.84 g/mL).
15. Distinguish between iodometric and iodimetric titrations with suitable examples.
16. Discuss the Lux-Flood and Usanovich concepts of acids and bases with suitable examples.
17. Describe the preparation methods of B_2H_6 and explain its structure.
18. Write a note on Carbon dating.
19. Define ionization energy and electron affinity. Comment on the horizontal and vertical trends.

(5 × 5 = 25 marks)

Section C

Answer any one question.

The question carries 11 marks.

20. Write an essay on safe laboratory practices and simple first aids which can be followed in an undergraduate chemistry laboratory.
21. (a) Explain the gaseous diffusion method and thermal diffusion method of separation of isotopes ; (b) Write a brief note on the oxides of N.

(1 × 11 = 11 marks)