24U123S (Pages: 2) Name: .....

Reg.No: .....

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024

(CBCSS - UG)

CC19U CHE1 B01 - THEORETICAL AND INORGANIC CHEMISTRY - I

(Chemistry - Core Course)

(2019 to 2023 Admissions - Supplementary/Improvement)

Time : 2.00 Hours Maximum : 60 Marks

Credit : 2

Part A (Short answer questions)

Answer ***all*** questions. Each question carries 2 marks.

1. What does the term empirical approach mean in science?
2. What are the steps to be taken when phenol comes into skin contact?
3. Define mole fraction of a component in a solution. How does it depend upon the temperature?
4. What is a primary standard in volumetric analysis?
5. Which titration method, conventional single burette or double burette method give more accurate results? Why?
6. Calculate the effect nuclear charge felt by a 3p electron of chlorine (At no. 17).
7. Arrange LiF, NaF and KF in the increasing order of lattice energy. Justify your answer.
8. Does water have a zero or non-zero dipole moment. Why?
9. How is diborane converted to borazine?
10. Explain the terms Usanovich acid and Usanovich base through examples.
11. Give an example each for a hard acid and a soft acid.
12. Explain the release of a large amount of energy during nuclear fission.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer ***all*** questions. Each question carries 5 marks.

13. Explain the term scientific observation and its role in science.
14. Discuss the significance of author citation in a research article.
15. State the important aspects to be considered with regard to safe storage of laboratory chemicals.
16. Distinguish between accuracy and precision relating to analytical results.
17. Explain the terms screening effect and effective nuclear charge.

18. The variation of standard reduction potentials down the Group for alkali metals is not gradual. How can this be explained?

19. Explain the diffusion methods for the separation of isotopes.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any ***one*** question. The question carries 5 marks.

20. Explain the term effective nuclear charge. Give the Slater's rules and discuss their applications.

21. Explain the structure of diborane and discuss it on the basis of the concept of hybridisation.

(1 × 10 = 10 Marks)

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