

D 32343

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Name.....

Reg. No.....

**FIRST SEMESTER (CBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2022**

Chemistry

CHE 1B 01—THEORETICAL AND INORGANIC CHEMISTRY—I

(2019—2022 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A (Short Answers)*Answer questions up to 20 marks.**Each question carries 2 marks.*

1. Distinguish between primary and secondary data.
2. Specify the major difficulties in the formulation of hypotheses.
3. What do the R and S phrases stand for ?
4. Calculate the normality of oxalic acid solution prepared by dissolving 1.575g in 250 mL.
5. Ionization enthalpies of Be and N are higher than expected. Why ?
6. What is the effective nuclear charge in a polyelectronic atom ?
7. Briefly explain the inert pair effect with an example.
8. State Born Lande equation.
9. What is the Lux-Flood definition of acids and bases ?
10. What are amphoteric oxides ? Suggest a couple of examples.
11. Calculate the decay constant of a radioactive element decayed to its 10 % of initial amount in 10 days.
12. Comment on the stability of the nucleus considering the proton-proton electrostatic repulsion into account.

[Ceiling of marks : 20]

Turn over

Section B (Paragraph)

Answer questions up to 30 marks.

Each question carries 5 marks

13. Briefly outline the essential components of a research publication ?
14. Explain the double burette method of titration; what are its advantages over burette-pipette titration ?
15. Write a note on the classification of errors.
16. Describe the Pauling and Mulliken scales of electronegativity.
17. Explain the principle behind flame tests shown by alkali metal ions.
18. Write a note on Pearson's HSAB concept.
19. Describe the gaseous diffusion method and thermal diffusion method of separation of isotopes.

(Ceiling of marks : 30)

Section C

*Answer any **one** question.*

The question carries 10 marks.

20. Explain the theory of : (a) Redox ; and (b) Complexometric titrations.
21. (a) Illustrate Born Haber cycle ; and (b) Discuss the use of radioactive isotopes tracers.

(1 × 10 = 10 marks)