D 50573 **(Pages : 2)** **Name.....**

Reg. No.....

FIFTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2023

Chemistry

CHE 5B 08—PHYSICAL CHEMISTRY—II

(2019 Admission onwards)

Time : Two Hours Maximum : 60 Marks

Section A (Short Answers)

Answer questions up to 20 *marks.*
Each question carries 2 *marks.*

1. Write Arrhenius equation and explain the terms.
2. Higher order reactions are not possible in chemical reactions. Why ?
3. Write Michaelis-Menten mechanism for enzyme catalysis.
4. Write any *four* postulates of Langmuir isotherm.
5. What are two component systems ? What are the maximum phases possible for two component systems ?
6. What are freezing mixtures ? Give examples.
7. With the help of energy level diagram, discuss the possible electronic transitions in an organic molecule.
8. What is the selection rule for anharmonic oscillator ?
9. Explain the two scales used in NMR. How are they related ?
10. What is the basic requirement for a molecule to exhibit ESR spectra ?
11. What is Chemiluminescence ?
12. State Grothus-Draper law.

(Ceiling of marks : 20)

Turn over

Section B (Short Answers)

Answer questions up to 30 *marks.*
Each question carries 5 *marks.*

13. Derive integrated rate equation for second order reaction with same reactants.

14. With suitable examples, explain the theory of homogeneous catalysis.

15. Discuss the phase diagram of water system.

16. What is CST ? Discuss systems with upper and lower CST.

17. What are fundamental and overtone bands in IR spectra ?

18. Discuss the high resolution NMR spectra of CH_3CHO molecule.

19. What is quantum yield of a photochemical reaction ? What are the reasons for high and low quantum yield ?

(Ceiling of marks : 30)

Section C (Essay)

Answer any **one** *question.*
The question carries 10 *marks.*

20. What are unimolecular reactions ? Explain Lindemann's mechanism for unimolecular reactions.

21. Discuss the rotational Raman spectra of pure diatomic molecules.

(1 × 10 = 10 marks)