D 10585 **(Pages : 2)** **Name.....**

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Chemistry

CHE 5B 08—PHYSICAL CHEMISTRY–II

(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. Define temper coefficient of a chemical reaction.
2. What is meant by steady-state approximation ?
3. Give the mathematical expression for Freundlich adsorption isotherm and explain the terms.
4. Discuss briefly the theory of homogeneous catalysis.
5. What is triple point ? What are its characteristics ?
6. What is the maximum number of phases possible for two component systems ?
7. What are condensed systems ? Give the phase rule for condensed systems.
8. What do you mean by finger print region in IR spectra ?
9. State and explain mutual exclusion principle.
10. What is Frank-Condon principle ?
11. How many ESR signals are given by methyl radical ?
12. State Stark-Einstein's law of photochemical equivalence.

(8 × 3 = 24 marks)

Turn over

Section B (Short Answers)

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. Derive integrated rate equation for zero order kinetics. What are the features of zero order kinetics ?

14. A first order reaction is 20% complete in 15 minutes at 40°C and in 3 minutes at 60°C. Calculate the activation energy for the reaction.

15. How will you determine the order of a reaction using half life method ?

16. Explain any *five* applications of adsorption.

17. What is chemical shift ? Why TMS is used as a standard in NMR spectra ?

18. What is Photosensitization ? Explain with suitable examples.

19. With the help of Jablonsky diagram, explain fluorescence phenomena.

(5 × 5 = 25 marks)

Section C (Essay)

Answer any **one** *question.*
The question carries 11 *marks.*

20. a) State distribution law ? What are its characteristics ?

    b) Derive distribution law and briefly explain any *two* applications.

21. Discuss in detail the vibrational spectra of anharmonic oscillator.

(1 × 11 = 11 marks)