

**D 13269**

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Name.....

Reg. No.....

**FIRST SEMESTER M.Sc. DEGREE EXAMINATION, DECEMBER 2016**

(CUCSS)

Chemistry

CH 1C 04—THERMODYNAMICS, KINETICS AND CATALYSIS

(2015 Admissions)

Time : Three Hours

Maximum : 36 Weightage

**Part A**

Answer **all** questions.

Each question carries a *weightage* of 1.

1. Distinguish between absolute entropy and residual entropy.
2. State the law of Raoult's ebullioscopy.
3. Write the Onsager reciprocal relation and explain the terms.
4. Distinguish between thermal diffusion and thermo-osmosis.
5. Explain with an example branched chain reaction.
6. State primary salt effect with an example.
7. What is threshold energy ? How it differs from activation energy ?
8. Write London equation for attractive surfaces.
9. What do you infer from BET adsorption isotherm ?
10. What is the principle of ESCA ?
11. What are Van't Hoff and Arrhenius intermediates ?
12. What is enzyme catalysis ? Give an example.

(12 x 1 = 12 weightage)

**Part B**

Answer any **eight** questions.

Each question carries a *weightage* of 2.

13. What are the drawbacks of first and second law of thermodynamics ?
14. Derive Duhem-Margules equation and its application.
15. Explain entropy production.
16. What is electrokinetic effect ? Explain.

Turn over

17. Write Rice-Herzfeld mechanism. Discuss.
18. What is the effect of ionic strength on rate of reaction ?
19. What are diffusion controlled reactions ? Explain with an example.
20. Write the principle of crossed molecular beams.
21. Write the assumptions of Langmuir's adsorption isotherm.
22. What is the principle of SEM ?
23. Write Oregonator mechanism of oscillating reaction.
24. Explain auto catalysis with example.

(8 x 2 = 16 weightage)

### Part C

Answer any **two** questions.

Each question carries a *weightage* of 4.

25. Discuss the application of Onsager reciprocal relations.
26. How will you study the kinetics of a fast reaction ?
27. Discuss the Lindemann's theory of unimolecular reactions.
28. Write the Langmuir-Hinshelwood mechanism with example.

(2 x 4 = 8 weightage)