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**GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR
(GIET UNIVERSITY)**



Ph.D. (Second Semester-Summer) Examinations, May - 2025

23SPPECY2015- Basic Physical Chemistry

(Chemistry)

Time: 3 hrs

Maximum: 70 Marks

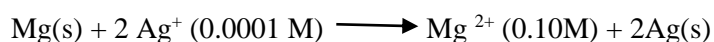
The figures in the right hand margin indicate marks.

Answer ANY FIVE Questions.

(14 x 5 = 70 Marks) Marks

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| 1.a. Explain zero, 1 st and 2 nd laws of Thermodynamics | 7 |
| b. Define the dynamics of unimolecular reaction with the help of lindmann mechanism | 7 |
| 2.a. Explain Debye Huckel-Onsager equation | 7 |
| b. Discuss on Ion-solvent interactions, Ion-Ion interactions, | |
| 3.a. Discuss different model of structure of double layer interfaces. | 7 |
| b. Application of Gibb-Helmholtz equation in electrochemistry | 7 |
| 4. What are the postulates of B.E.T. equation? Derive B.E.T. equation. | 14 |
| 5.a. Define Microemulsion and reverse micelles | 7 |
| b. Give an account of Thermodynamics of micellization. | 7 |
| 6.a. Differentiate adsorption and absorption. | 7 |
| b. Explain the characteristics of physical adsorption and chemical adsorption. | 7 |
| 7. Define critical micellar concentration (CMC), Explain in brief the factors affecting CMC of surfactants, | 14 |
| 8.a. Derive Nernst's equation. | 7 |

Find Cell potential (E)_{cell} For the following reaction



The E° electrode values are $\text{Mg}^{2+} / \text{Mg} = -2.36 \text{ V}$ $\text{Ag}^+ / \text{Ag} = 0.81 \text{ V}$

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|---------------------------------------|---|
| b. Derive the entropy of an ideal gas | 7 |
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