



Roll no.

राष्ट्रीय प्रौद्योगिकी संस्थान, हमीरपुर
National Institute of Technology, Hamirpur

M. Tech & Ph. D (Chemical Engineering)–1st Semester

End Term Examination (17th December 2020)

CH - 713 Interfacial Science & Engineering

Duration: 2 Hours

Max. Marks: 50

Note

- *This question paper consists of eight questions and one page.*
- *Attempt all questions.*
- *Wherever necessary, draw neat diagram and label properly.*

Q1. Explain in detail any five terms with neat label diagram **(10 marks)**

- | | |
|---|---|
| i. Brownian motion | iv. Osmotic pressure |
| ii. Bilayers, liposomes and vesicles | v. Ostwald ripening and creaming |
| iii. Surface tension and surface energy | vi. Winsor's classification of microemulsions |

Q2. Explain the modern theory of electrostatic double layer with label diagram **(6 marks)**

“OR”

Q3. Explain the significance of DLVO theory and non-DLVO forces **(6 marks)**

Q4. Explain the importance of interfacial engineering and interfacial tension **(4 marks)**

Q5. Define colloids, classification of colloids and explain the thermodynamic and kinetic stabilities of colloids **(10 marks)**

Q6. What are the different methods available to measure surface tension and explain any two methods with label diagram, advantages, disadvantages and limitations **(10 marks)**

Q7. Explain the classification of surfactants with formation of various types of micelles and the importance of hydrophilic–lipophilic balance (HLB) **(10 marks)**

-----End of Question Paper-----