

M. TECH. –I (CHEMICAL ENGINEERING) (CBCS – 2015 COURSE)  
: WINTER - 2017

SUBJECT: THERMODYNAMICS OF PHASE EQUILIBRA

Day: **Friday**  
Date: **19/01/2018**

Time: **11.00 AM TO 02.00 PM**  
Max marks: 60

**W-2017-2798**

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**N.B:**

- 1) All questions are **COMPULSORY**.
  - 2) Figures to the right indicate **FULL** marks.
  - 3) Answer to both the sections should be written in **SEPARATE** answer book
  - 4) Assume suitable data if necessary.
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**SECTION-I**

- Q.1** What are the characteristics of an Ideal solution? What is Lewis Randall rule? (10)  
**OR**  
Discuss generalized correlation for fugacity coefficient. (10)
- Q.2** Derive criterion for phase equilibrium. (10)  
**OR**  
Write short notes on the following: (10)  
**a)** Solubility of gas in liquid  
**b)** Osmotic equilibrium and osmotic pressure
- Q.3** Describe an equation relating gas and solid in equilibrium (10)  
**OR**  
Derive an expression for freezing point depression of solvent due to presence of solute. (10)

**SECTION-II**

- Q.4** Explain chemical equilibrium for several reactions occurs in single phase. (10)  
**OR**  
Apply phase rule to determine the No. of independent variables associated with a multi component multiphase system. (10)
- Q.5** Describe Gibb's adsorption equation. (10)  
**OR**  
Explain effect of particle size on vapor pressure. (10)
- Q.6** Explain solubility's of weak acids and bases. (10)  
**OR**  
Develop control volume exergy rate balance reaction. (10)

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