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B.E./B.Tech. 1st Semester Examination,

December-2013

CHEMISTRY

Paper-CH-101-E

Time allowed : 3 hours]

[Maximum marks : 100

Note : Attempt any five questions. All questions carry equal marks.

1. (a) Derive an integrated form of Clausius-Clapeyron equation and discuss two applications of it. 12
(b) At 373.6 K and 372.6 K the vapour pressure of water are 1.018 and 0.982 atm. respectively. Calculate the heat of vapourization of water. 4
(c) Define and explain the term chemical potential. 4
2. (a) What do you understand by Congruent melting point? Discuss Zn-Mg system in detail. 12
(b) Define the terms used in phase rule and derive Gibb's Phase Rule Equation. 8
3. (a) Write short notes on : 12
 - (i) Alkalinity of water
 - (ii) Calgon conditioning
 - (iii) Ca. carbonate conditioning.

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- (b) What is the principle of EDTA titration ? How hardness is determined by this method ? 8
4. (a) Explain Zeolite process for water softening. 10
- (b) Write short notes on : 5×2
- (i) Reverse osmosis
- (ii) Ion-exchange process.
5. Write short notes on the following : 20
- (i) Galvanic corrosion
- (ii) Electrochemical theory of corrosion
- (iii) Differential aeration corrosion
- (iv) Protective coatings.
6. (a) Discuss the mechanism of hydrodynamic lubrication. Under what conditions are gases preferred to lubricating oils ? 12
- (b) Define and give significance of :
- (i) Iodine value
- (ii) Acid value. 8
7. (a) What are silicones ? Discuss their important properties and uses. 10

(b) What are elastomers ? Discuss preparation, properties and technical applications of SBR. 10

8. (a) Explain the principle and application of IR spectroscopy. What is the importance of finger print region in this technique ? 10

(b) Write down the principle, working and applications of DSC. 10