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B.E. 2nd Semester Examination,

May-2013

CHEMISTRY

Paper-CH - 101-E

Time allowed : 3 hours.]

[Maximum marks : 100

Note : Attempt any five questions.

1. (a) Calculate the change in volume for melting of 1 mole of phenol. Given latent heat of fusion = 2340 cal/g. m.pt. of phenol = 313 K. $dp/dT = 284 \text{ atm K}^{-1}$. 8
(b) Derive Gibb's Helmholtz equation in terms of enthalpy and free energy. Discuss any two of its applications. 12
2. With the help of a phase diagram, discuss salient features of Pb-Ag system. How the thermal analysis can be employed for determining phase diagram? 12,8
3. (a) What is the principle of EDTA titration? How is hardness determined by this method? 12
(b) What is the role of buffer in EDTA titration? 3

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- (c) 100 ml of a water sample required 16 ml of $\frac{N}{50}$ H_2SO_4 for neutralisation to phenolphthalein end-point. After this methyl orange indicator was added and a further 20 ml of the acid was required for neutralisation. Calculate the alkalinity of each type and the total alkalinity of the sample in terms of ppm of $CaCO_3$. 5

4. (a) Comment upon cathodic protection. 5

(b) What is corrosion and how it occurs? Explain the mechanism of dry corrosion. 10

(c) Write short note on stress corrosion. 5

5. (a) Explain the reverse osmosis method for desalination of water. 6

(b) How the ion-exchange resins are employed for softening of hard water? 10

(c) Define the following terms:

(i) Disinfection of water

(ii) Sterilisation of water

(iii) Coagulation

(iv) Scale. 4

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6. (a) Define the terms lubricant and lubrication. State mechanism of boundary lubrication. 10
- (b) Write short note on synthetic lubricants and Greases. 5,5
7. (a) Discuss preparation, properties and uses of SBR and GR-N. 7,7
- (b) Write short note on polymerisation. 6
8. (a) What is the principle of conductometric titration? Describe the conductometric titration of strong acid with weak base. 8
- (b) Discuss principle, method and applications of thermogravimetric analysis. 12

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