24005

B. Tech. 2nd Semester F. Scheme Examination,
May–2014
ENGINEERING CHEMISTRY
Paper–CH–101-F
Common for all branches

Time allowed : 3 hours] *[Maximum marks : 100*

Note : *Attempt **five** questions in total selecting at least **one** question from each section. **Q. No. 1** is **compulsory**. All questions carry equal marks.*

1. Answer the following : 2×10

(i) What are solid lubricants ? Give examples.

(ii) Why is Teflon highly chemical resistant ?

(iii) What is autocatalysis ?

(iv) What is the basic principle of thermal methods of analysis ?

(v) A solution of thickness 2cm. transmits 40% incident light. Calculate the concentration of the solution given $\epsilon = 6000 dm^3 mol^{-1} cm^{-1}$.

(vi) Why additives are used in lubricants ?

(vii) Calculate the number of component, number of phases and degree of freedom for the following equilibria : Solid carbon in equilibrium with gaseous CO, CO_2 and O_2 at 373K.

(viii) What is the difference between Scale and Sludges?

(ix) What do you mean by reverse osmosis ?

(x) Define and give an example of condensation polymerisation.

Section–A

2. (a) Define phase rule. Explain phase diagram of a one component system. 10

(b) Discuss phase diagram of Na_2SO_4–H_2O system. 10

3. (a) Write an explanatory note on enzymatic catalysis. 10

(b) Explain the role of promoters and poisoners in catalysis. 10

Section–B

4. (a) Write short notes on : 5×3

(i) Ion Exchange Process

(ii) Boiler Corrosion

(iii) Mixed bed deionization

(b) Discuss a method of determination of hardness of water. 5

5. Discuss Lime-Soda treatment method of softening of water. 8

(b) Write a short note on alkalinity of water and method of determination of it. 8

(c) Calculate temporary hardness and total hardness of a sample of water containing :

$Ca(HCO_3)_2 = 16.2mg/L$; $Mg(HCO_3)_2 = 7.3mg/L$; $CaSO_4 = 13.6mg/L$ $MgCl_2 = 9.5mg/L$. 4

Section–C

6. (a) What do you mean by Electroplating ? Describe two methods of electroplating . 8

(b) Write short note on the following : 12

(i) Cloud point and pour point

(ii) Consistency and drop point of greases

(iii) Biodegradable lubricants.

7. (a) Why additives are used in lubricants ? Give some examples. 6

(b) Explain the mechanism of Dry corrosion. 6

(c) Write short note on the following : 8

(i) Pitting Corrosion

(ii) Microbiological Corrosion.

Section–D

8. (a) What are thermoplastics and thermosets ? Discuss technical applications of Teflon, UF and SBR. 4,6

(b) Differentiate between addition, condensation and co-ordination polymerization. 6

(c) Write a short note on Biodegradable polymers. 4

9. (a) State Lambert and Beer's Law and discuss the basic principle of spetroscopy. 2,4

(b) Write down the principle and working of DTA. How is it different from DSC ? 12

(c) Why spectroscopic methods are better than the classical methods ? 2