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**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 $\epsilon = 6000\text{dm}^3\text{mol}^{-1}\text{cm}^{-1}$.
- (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

(2)

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- (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 $\text{Na}_2\text{SO}_4\text{--H}_2\text{O}$ 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 :
- $\text{Ca}(\text{HCO}_3)_2 = 16.2\text{mg/L}$; $\text{Mg}(\text{HCO}_3)_2 = 7.3\text{mg/L}$;
 $\text{CaSO}_4 = 13.6\text{mg/L}$ $\text{MgCl}_2 = 9.5\text{mg/L}$. 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 spectroscopy. 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