# CY-1858

## B.Tech. (Semester-II) Exam.–2015

## Engineering Chemistry

*Time : Three Hours*

*Maximum Marks :* **100**

**Note :- Attempt questions from all the sections.**

## SECTION - A

(Short Answer Type Questions)

**Note :** Attempt **any ten** questions. Each question carry 4 marks $4\times10=40$

1. What are Fullerenes? Discuss its applications

2. Distinguish between Molecularity and order of reaction.

3. Discuss uses of IR Specteroscopy for the determination of structure of simple organic compounds.

4. What do you understand by natural and synthetic rubbers. Discuss in brief.

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5. Discuss Optical isomerism in Lactic Acid.

6. Calculate the electrode potential of the following half cell :

$Zn / Zn^{2+}$ (a = 0.1)

The standard potential of zinc electrode is 0.7618 Volt.

7. 40% of a first order reaction is completed in 20 minutes. How long will it take to complete 80%.

8. Draw molecular orbital diagram for N2 molecule. Calculate its bond order.

9. Write a short note on Hydrogen bond.

10. What is Photochemical Smog? Discuss its formation.

11. What is Phase rule? Define term phase component and degree of freedom.

12. What is activation energy? How would you determine it?

13. Explain mechanism of Nucleophilic substitution reactions.

14. Discuss concentration cell.

15. Discuss factors affecting the rate of a chemical reaction.

## SECTION - B

(Long-answer Type Questions)

**Note :** Attempt **any three** questions. Each question carries 20 marks. 20×3=60

1. a. What do you understand by first order reactions. Derive an expression for the rate constant of a first order reaction. Give its unit.

   b. The half life period of a second order reaction is 90 minutes. Calculate the time required for its 60% completion.

2. Write short notes on the following .

   i. Radius Ratio Rule

   ii. Reverse osmosis

   iii. Uses of NMR Spectroscopy

   iv. Molecular chirality

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3 a. How are carbocations formed? Give their reactions. Discuss their structure.

b. Describe conformations of Butane.

4. a. Write mechanism of following reactions :

i. Cannizzalo reaction

ii. Diels -alder reaction

b. Discuss E-Z nomenclature with suitable examples.

5 a. Draw phase diagram of water system and discuss it.

b. Discuss electrochemical theory of corrosion.

6. a. What do you understand by Environmental pollution? How many types are these? Explain different sources of air pollution

b. What is acid rain? Discuss effect of Acid rain