

Sep-21-00008

B. Tech. EXAMINATION, 2021

Semester I (CBCS)

ENGINEERING CHEMISTRY

CH-101

Time : 2 Hours

Maximum Marks : 60

The candidates shall limit their answers precisely within 20 pages only (A4 size sheets/assignment sheets), no extra sheet allowed. The candidates should write only on one side of the page and the back side of the page should remain blank. Only blue ball pen is admissible.

Note : Attempt *Four* questions in all, selecting *one* question from any of the Sections A, B, C and D.
Q. No. 9 is compulsory.

Section A

1. (a) Describe the ion-exchange process for water softening. What are its advantages. **7.5**
- (b) Describe the Nernst equation in detail. **7.5**

2. (a) Write short note on degree of hardness and water softening. **7.5**
 (b) Describe the principle and construction of a glass electrode. **7.5**

Section B

3. (a) What is corrosion ? Describe the various factors affecting the corrosion. **7**
 (b) Explain IR spectrophotometer with principle and instrumentation. **8**
4. (a) Discuss the basic principle and application of XRD. **7**
 (b) Define the terms chromophore and auxochrome in UV spectroscopy. **8**

Section C

5. (a) What is meant by proximate analysis of coal ? What are the quantities estimated in this analysis and their significance ? **7**
 (b) Discuss the mechanism of thin film and fluid film Lubricants. **8**
6. (a) Write short note on octane number and thermal cracking. **7**
 (b) What are solid lubricants ? Mention their applications. **8**

Section D

7. (a) What are polymers ? Write a short note on thermoplastic and thermosetting polymers. **7**
 (b) What do you understand by carbon nanotubes ? What are its applications ? **8**
8. (a) What is vulcanization of rubber ? How does it improve the properties of natural rubber ? **7**
 (b) What are fullerenes ? Discuss their applications. **8**

Compulsory Question

9. Answer all the questions : **1.5×10=15**
- (a) Distinguish between temporary hardness and permanent hardness.
 (b) Write the structure of EDTA and its complex with Ca^{+2} ion.
 (c) Define standard electrode potential.
 (d) Difference between dry and wet corrosion.
 (e) What is salt bridge ?
 (f) Differentiate : Hyperchromic and hypochromic shift.
 (g) What is power alcohol ?
 (h) Write short note on Buna-S and Buna-N.
 (i) Define electroplating.
 (j) What is aniline point ? Mention its significance.