

**I B. Tech II Semester Regular/Supplementary Examinations, July/August-2023**  
**ENGINEERING CHEMISTRY**

(Common to CE, ME, Agri E)

Time: 3 hours

Max. Marks: 70

*Answer any FIVE Questions One Question from Each Unit*  
*All Questions Carry Equal Marks*

**UNIT-I**

1. a) Explain the preparation, Properties and applications of Buna-S. [7M]  
b) Write about conducting polymers. [7M]

**(OR)**

2. a) Summarize compounding of Plastics. [7M]  
b) Explain the methods of polymerization. [7M]

**UNIT-II**

3. a) Describe the construction and working of Lithium batteries. [7M]  
b) Explain the factors that are influencing the corrosion. [7M]

**(OR)**

4. a) What is electroplating? Explain. [7M]  
b) Describe the theories of Corrosion. [7M]

**UNIT-III**

5. a) Explain characterization of Nano materials by (transmission electron microscopy [TEM]) with example ( $\text{TiO}_2$ ). [7M]  
b) Explain the types of carbon Nano tubes. [7M]

**(OR)**

6. a) Define lubricants and explain their importance. [7M]  
b) Write a note on constituents of Portland cement and their functioning. [7M]

**UNIT-IV**

7. a) Explain proximate and ultimate analysis of coal. [7M]  
b) Summarize petrol knocking. [7M]

**(OR)**

8. a) Write about anti-knocking agents. [7M]  
b) Describe Flue gas analysis by Orsat apparatus. [7M]

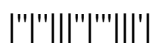
**UNIT-V**

9. a) Explain internal treatment of boiler water. [7M]  
b) How is hardness water determined? [7M]

**(OR)**

- 10 a) Explain desalination of brackish water by electro dialysis. [7M]  
b) Write about caustic embrittlement. [7M]

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*Answer any FIVE Questions One Question from Each Unit**All Questions Carry Equal Marks***UNIT-I**

1. a) Illustrate the applications of composite materials. [7M]  
b) Write the mechanical properties of polymers. [7M]

**(OR)**

2. a) Write a note on Thiokol. [7M]  
b) Give some examples of plastic materials used in electronic gadgets. [7M]

**UNIT-II**

3. a) Explain the working of Hydrogen and Oxygen fuel cells. [7M]  
b) Explain different types of corrosion. [7M]

**(OR)**

4. a) Describe the construction and Working of Dry cell and write its applications. [7M]  
b) Write about protecting coatings. [7M]

**UNIT-III**

5. a) Illustrate Instrumentation and applications of differential thermal analysis (DTA). [7M]  
b) Give the definition and classification of Refractories. [7M]

**(OR)**

6. a) Explain the mechanism involved in Lubricants. [7M]  
b) Give the applications of Graphene and Fullerenes. [7M]

**UNIT-IV**

7. a) Write a note on Refining-Cracking. [7M]  
b) Describe Calorific Values. [7M]

**(OR)**

8. a) Explain about Rocket fuels. [7M]  
b) Write a note on Natural gas. [7M]

**UNIT-V**

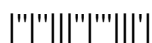
9. a) Write about the hardness of water. [7M]  
b) Explain the Ion exchange process. [7M]

**(OR)**

- 10 a) Explain Boiler corrosion and priming problems in boiler troubles. [7M]  
b) Explain desalination of water by Reverse osmosis. [7M]

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**UNIT-I**

1. a) Explain preparation and properties of Polycarbonates. [7M]  
b) Write a note on recycling of e-plastic waste. [7M]

**(OR)**

2. a) Give the preparation and applications of polyurethanes. [7M]  
b) Discuss about the Fiber reinforced plastics. [7M]

**UNIT-II**

3. a) Explain about zinc air cells in batteries. [7M]  
b) Write a note on Electroless plating. [7M]

**(OR)**

4. a) Summarize about Paints [7M]  
b) Explain about surface preparation methods in Protective coatings. [7M]

**UNIT-III**

5. a) Explain deterioration of cement. [7M]  
b) Write a note on Nanomaterials characterization by (Brunauer Emmett Teller BET). [7M]

**(OR)**

6. a) Explain differential scanning calorimetry (DSC). [7M]  
b) Discuss the failure of refractories. [7M]

**UNIT-IV**

7. a) Give the importance of Proximate analysis of Coal. [7M]  
b) Write a note on synthetic petrol. [7M]

**(OR)**

8. a) Discuss liquefied petroleum gas. [7M]  
b) Explain octane and octane ratings. [7M]

**UNIT-V**

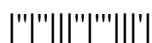
9. a) Explain briefly about boiler troubles. [7M]  
b) Explain internal treatments in softening of hard water by zeolite process. [7M]

**(OR)**

- 10 a) Give the steps involved in purification of water. [7M]  
b) Write about break point chlorination. [7M]

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**UNIT-I**

1. a) Explain preparation and properties of PVC. [7M]  
b) Write a note on Compounding of plastics. [7M]

**(OR)**

2. a) Give the preparation and applications of Buna S. [7M]  
b) Discuss about the biomedical polymers. [7M]

**UNIT-II**

3. a) Explain about CH<sub>3</sub>OH-O<sub>2</sub> Fuel cell. [7M]  
b) Write a note on galvanic series. [7M]

**(OR)**

4. a) Summarize standard hydrogen electrode. [7M]  
b) Explain about factors influencing rate of corrosion. [7M]

**UNIT-III**

5. a) Explain sol-gel method in Nano materials. [7M]  
b) Apply BET (Brunauer Emmett Teller) method to characterize Nano Materials and explain. [7M]

**(OR)**

6. a) Explain Instrumentation and applications of thermo gravimetric analysis (TGA). [7M]  
b) Define refractories and give their classification. [7M]

**UNIT-IV**

7. a) Discuss about Introduction to alternative fuels. [7M]  
b) What is meant by calorific value? Give its importance in coal analysis. [7M]

**(OR)**

8. a) Write about anti-knocking agents. [7M]  
b) Explain Flue gas analysis by Orsat apparatus. [7M]

**UNIT-V**

9. a) Explain the steps involved in purification of water. [7M]  
b) Explain desalination of hard water by reverse osmosis. [7M]

**(OR)**

- 10 a) Discuss the determination of hardness by complexometric method. [7M]  
b) Explain the softening of hard water by the zeolite process. [7M]

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