

**I B. Tech I Semester Regular Examinations, Jan - 2020**  
**APPLIED CHEMISTRY**  
(Common to CSE & IT Branches)

Time: 3 hours

Max. Marks: 60

**Note: Answer ONE question from each unit (5 × 12 = 60 Marks)**

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**UNIT - I**

1. a) What are the advantages of plastics over metals? And differentiate plastics based on their thermal properties. (4M)
- b) Write the chemical reactions involved in the preparation of Bakelite and list the applications of Bakelite. (4M)
- c) What are the composite materials? Explain with an example. (4M)

**(OR)**

2. a) Describe the mechanical properties of polymers. (5M)
- b) Explain the preparation, properties and applications of Buna-s rubbers. (3M)
- c) Describe the types of extrinsically conducting polymers. (4M)

**UNIT – II**

3. a) Explain the primary and secondary batteries with examples. What are the advantages of secondary batteries over primary batteries? (4M)
- b) Using following hypothetical half-cell reactions, design maximum number of possible electrochemical cells and arrange them in a decreasing order of EMF. (4M)
  - i)  $A + e^- \rightarrow A^-$  -----  $E^{\circ} = + 1.2 \text{ V}$
  - ii)  $B + e^- \rightarrow B^-$  -----  $E^{\circ} = + 0.2 \text{ V}$
  - iii)  $C + e^- \rightarrow C^-$  -----  $E^{\circ} = - 1.1 \text{ V}$
  - iv)  $D + e^- \rightarrow D^-$  -----  $E^{\circ} = - 1.7 \text{ V}$
- c) Explain tinning and galvanizing methods in corrosion controle. (4M)

**(OR)**

4. a) Explain construction and working of a H<sub>2</sub>-O<sub>2</sub> fuel cell. (4M)
- b) Describe the factors influencing the corrosion related to nature of metal. (4M)
- c) Describe the phenomenon of passivity and its significance. (4M)

**UNIT – III**

5. a) Distinguish between TEM and SEM methods. (4M)
- b) Explain Sol-Gel method for the preparation of inorganic nano materials. (4M)
- c) What are liquid crystals and describe its classification? (4M)

**(OR)**

6. a) Write a detailed note on chalcogenide semiconductors. (4M)
- b) Explain the preparation of carbon nanomaterials by carbon-arc method. (4M)
- c) Describe zone refining method. (4M)

**UNIT –IV**

7. a) What are molecular machines and how they are characterized? (4M)  
b) Describe principles of green chemistry with proper justification by green synthesis. (4M)  
c) Write a short note on aqueous phase reactions. (4M)

**(OR)**

8. a) Write a detailed note on phase transfer catalysis. (4M)  
b) What are autonomous light powered molecular motors and explain? (4M)  
c) Write a short note on microwave assisted chemical reactions. (4M)

**UNIT –V**

9. a) Describe Beer-Lamberts law and give its limitations. (4M)  
b) Describe modes of molecular vibrations with a suitable example. (4M)  
c) Explain about functional group region. (4M)

**(OR)**

10. a) Describe the applications of UV-visible spectroscopy. (6M)  
b) Discuss about (i) chemical shift, (ii) finger print region. (6M)

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