

B.Tech I Year I Semester (R19) Regular Examinations January 2020

**CHEMISTRY**

(Common to CSE and IT)

Time: 3 hours

Max. Marks: 70

**PART – A**

(Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- Write Schrodinger equation.
  - Write the electronic configuration and bond order of  $O_2^+$ .
  - Calculate the electrode potential of copper, if the concentration of  $CuSO_4$  is 0.1 M. Given that  $E^0_{Cu^{2+}/Cu} = +0.34$  V
  - Define battery? Give examples for secondary battery.
  - What is stereospecific polymerization?
  - What is meant by functionality?
  - What is the importance of fingerprint region in IR spectrum?
  - State Beer's - Lambert's law of absorption.
  - Define the term catenanes.
  - Explain the role of supramolecules as switching devices.

**PART – B**

(Answer all five units, 5 X 10 = 50 Marks)

**UNIT – I**

- 2 Discuss the molecular orbital diagram of CO and find out its bond order.

OR

- 3 (a) Explain wave nature of electrons.  
(b) Discuss  $\pi$ -molecular orbitals of benzene.

**UNIT – II**

- 4 (a) Derive Nernst equation for a electrochemical cell.  
(b) Explain the working of methanol fuel cells.

OR

- 5 (a) Explain conductometric titration of strong acid and strong base with example.  
(b) What is electrochemical sensor? Explain amperometric sensors with examples.

**UNIT – III**

- 6 (a) Explain the preparation and applications of urea-formaldehyde.  
(b) Write a short note on chain growth and step growth polymerization.

OR

- 7 (a) Explain the conducting behaviour of polyaniline.  
(b) Discuss any one mechanism of polymer formation.

**UNIT – IV**

- 8 (a) Explain IR spectrophotometer with instrumentation.  
(b) Discuss the principle involved in HPLC.

OR

- 9 (a) Explain the principle of NMR spectroscopy.  
(b) Describe in brief the terms: (i) Auxochrome. (ii) Chromophore.

**UNIT – V**

- 10 Explain briefly about basic lock and key mechanism principle of supramolecules.

OR

- 11 (a) Write a note on self assembly in biological systems.  
(b) Explain the role of supramolecules as catalysts.