

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**

- Explain wave nature of electrons.
- Discuss  $\pi$ -molecular orbitals of benzene.

**UNIT – II**

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

**OR**

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

**UNIT – III**

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

**OR**

- Explain the conducting behaviour of polyaniline.
- Discuss any one mechanism of polymer formation.

**UNIT – IV**

- Explain IR spectrophotometer with instrumentation.
- Discuss the principle involved in HPLC.

**OR**

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

**UNIT – V**

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

**OR**

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