

Unit IV

No. of Printed Pages : 5

Roll No.

7. (a) Discuss the principle of electronic spectroscopy. Give its applications also.

5

- (b) State and explain the rotational spectra of diatomic molecules. Discuss its application.

10

Or

8. (a) Illustrate the basic principle of fluorescence spectroscopy. Discuss the theory, instrumentation and important applications of it in medicine.

9

- (b) Summarize diffraction and scattering techniques.

6

Compulsory Question

9. (a) State and explain the role of doping on band structures.

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B.Tech. EXAMINATION, 2024

(First Semester)

(C Scheme) (Re-appear Only)

CH101C

(Common for All Branches)

CHEMISTRY

Time : 3 Hours]

[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 9 is compulsory. All questions carry equal marks. Draw neat diagrams wherever applicable.

Unit I

1. (a) Illustrate solution of particle in one dimensional box. Discuss its application for conjugated molecule. 10
- (b) Explain wave function and electron negativity in details. 5

Or

2. (a) Describe the π -molecular orbital of butadiene molecule. 7
- (b) Define polarizability. Give example also. 3
- (c) Demonstrate band structure of solids. 5

Unit II

3. (a) Explain symmetry chirality and optical activity with example. 8
- (b) Demonstrate the synthesis and mechanism of aspirin. 7

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Or

4. (a) Show the mechanism of ring opening reaction by taking suitable example. 7
- (b) Describe all the conformations and potential energy diagram of *n*-hexane. 8

Unit III

5. (a) What is critical phenomenon ? Derive equations of states of real gases. 8
- (b) Describe acid-base equilibria in detail. 7

Or

6. (a) Give a detailed discussion on temporary and permanent hardness. 8
- (b) Discuss the use free energy in metallurgy with the help of Ellingham diagram. 7

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- (b) Gives a discussion on effective nuclear charge. 2
- (c) Discuss about the diastereomers. 2
- (d) Illustrate addition reaction with example. 2
- (e) Summarize the various applications of diffraction. 2
- (f) Discuss potential energy surfaces. 2
- (g) Define cell potential. 2
- (h) What are selection rules for electronic spectroscopy ? 1

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