

Roll No.....

Total No. of Units : 04

Total No. of Printed Pages : 03

Code No. : 04/102

Fourth Semester Examination, May 2019

M.Sc. CHEMISTRY

Paper - I

SOLID STATE AND PHOTOCHEMISTRY

Time : 3 Hrs.

Max. Marks : 80

- Part A and B of each question in each unit consist of very short answer type questions which are to be answered in one or two sentences. Part C (Short answer type) of each question should be answered in 200-250 words.
- Part D (Long answer type) of each question should be answered within the word limit 400-450.

Unit - I

Q.1 A. What is intrinsic defect? (2)

Q.1 B. What is colour centre? (2)

Q.1 C. Explain Nano-crystalline phase. (4)

OR

Explain Non-stoichiometry defects with example.

Q.1 D. Discuss thermodynamics of Schottky defects. (12)

OR

Describe the preparation, properties and applications of nano-crystalline materials.

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Unit - II

- Q.2 A. What do you mean by forbidden zone? (2)
- Q.2 B. Write the names of two semiconductors. (2)
- Q.2 C. Explain semiconductors. (4)

OR

Explain photoelectric effects.

- Q.2 D. Discuss quantum theory of paramagnetism. (12)

OR

Describe magnetic and optical properties of solids.

Unit - III

- Q.3 A. What are singlet and triplet excitation states? (2)
- Q.3 B. What is fluorescence? (2)
- Q.3 C. Explain photosensitization reaction with example. (4)

OR

Write the mechanism of intermolecular reaction of unsaturated carbonyl compounds.

- Q.3 D. Discuss the physical pathway of dissipation of energy during a photochemical reaction and draw Jablonski diagram. (12)

OR

Explain the mechanism of intermolecular photocyclo-addition reaction [Paterno-Buchi-reaction].

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Unit - IV

- Q.4 A. Define photo-oxidation reactions. (2)
- Q.4 B. What is photochemical smog? (2)
- Q.4 C. Write a note on cis-trans photoisomerization in olefinic compounds. (4)

OR

Explain Photo-Fries reaction of anilides with at least one example.

- Q.4 D. Explain the mechanism of photochemical rearrangement of 1, 4 dienes. (12)

$\alpha - \beta$

OR

Write the mechanism of Barton reaction with example.

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