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MSCCH-601

Solid State and Materials Chemistry

M.Sc. Chemistry (MSCCH)

3rd Semester Examination, 2022 (Dec.)

Time : 2 Hours] **Max. Marks : 70**

Note : This paper is of Seventy (70) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

SECTION–A
(Long Answer Type Questions)

Note : Section 'A' contains Five (05) long answer type questions of Nineteen (19) marks each. Learners are required to answer any Two (02) questions only.

(2×19=38)

1. Write note on :

(a) Crystallographic planes.

(b) Miller Indices.

(c) Bravais lattices. [19]

2. What are molecular rectifiers and transistors discuss their theories with suitable examples. [19]

3. Write note on :

(a) Liquid crystal.

(b) Smectic-Nematic transition.

(c) Disadvantage of liquid crystal polymer. [19]

4. Discuss the process of artificial photosynthesis scheme for capturing and storing the energy. [19]

5. Write note on:

(a) Thermodynamics of micellization

(b) Optical properties of liquid crystals

(c) X-ray diffraction

SECTION–B

(Short Answer Type Questions)

Note : Section 'B' contains Eight (08) short answer type questions of Eight (08) marks each. Learners are required to answer any Four (04) questions only. (4×8=32)

1. Draw the following crystal structures : NaCl, CsCl, tetragonal. [4]

2. Write note one :

(a) Schottky defect.

(b) Frenkel defect. [4]

3. Write about active and passive sensor. [4]

4. How Bragg's description of diffraction is different from Law ? [4]

5. Describe the optical properties of liquid crystal. [4]

6. Describe the important applications of surfactants. [4]

7. What are surface active agents. How it can be classified ? [4]

8. How do defects affect material properties ? [4]