



**MANIPAL**  
ACADEMY of HIGHER EDUCATION

Deemed to be University under Section 3 of the U.O. Act, 1956

Reg. No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**DEPARTMENT OF SCIENCES, IV SEMESTER M. Sc. (CHEMISTRY)**  
**END SEMESTER EXAMINATIONS, JUNE 2021**

**MATERIALS CHEMISTRY [CHM 5001]**  
**(REVISED CREDIT SYSTEM-2017)**

Time: 2 Hours

Date: 12-06-2021

MAX. MARKS: 40

Note: (i) Answer **ALL** questions

(ii) Draw diagrams, and write equations wherever necessary

1. A. Discuss the various types of Fullerenes and their characteristic properties.
1. B. Explain the types of chemical bonds and their influence on the properties of materials.  
(5+5)
2. A. What are the different classes of liquid crystalline materials based on the shape of the molecules? Explain them with suitable examples.
2. B. Explain the different types of Carbon and Alloy steels and their uses.  
(5+5)
3. A. Describe the following methods of preparation of thin films
  - (i) Electron beam evaporation method
  - (ii) Sol gel method.
3. B. Explain the different types of Nanowires and Nanorods with their applications.  
(5+5)
4. A. Discuss the following
  - (i) Organic Semiconductors
  - (ii) Organic Light emitting diodes
4. B. Explain the working of LC numeric display pixel.  
(5+5)
5. A. Discuss the various types of composite materials and biomaterials with suitable examples.
5. B. Explain the principle and working of Scanning Electron Microscope (SEM) with a neat diagram.  
(5+5)
6. A. Distinguish between the following:
  - (i) Thermotropic and Lyotropic liquid crystalline materials
  - (ii) Nematic and Smectic phases
6. B. Explain the different types of high strength low alloy steels and Tools steels.  
(5+5)

\*\*\*\*\*