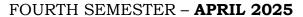
LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034



B.Sc. DEGREE EXAMINATION – **CHEMISTRY**





16/17/18UCH4ES02 - MATERIALS SCIENCE

Da	ate: 08-05-2025 Dept. No.	Max.: 100 Marks
Ti	me: 09:00 AM - 12:00 PM	
	SECTION A	
An	SECTION A swer ANY FOUR of the following 4	x 10 = 40 Marks
1.	a) How are nanomaterials synthesized by sol-gel method?	A 10 HO Marks
1.	b) Discuss the electronic properties of CNTs.	(5+5)
2.	a) Explain the principle and steps involved in the preparation of nano partic	` /
	approach.	
	b) Differentiate between SWNT and MWNT.	(6+4)
3.	What are semiconductors? How are they classified?	,
4.	a) Write the working principle of biosensor with example.	(5+5)
	b) Deduce the mechanism of VOC sensors.	,
5.	a) Explain the various types of magnetic materials with examples.	
	b) Summarize the procedure for measuring the humidity of a sample.	(5+5)
6.	a) Discuss the kinetics of polymerization reactions.	
	b) List any five differences between thermosetting and thermoplastics.	(5+5)
7.	a) How is the processing of polymers carried out by die casting method? Explain.	
	b) Discuss the mechanism of anionic polymerization .	(5+5)
8.	a) What are the steps involved in the preparation of a polymer by emulsion	polymerization?
	b) How is nylon-66 synthesized? Mention its uses.	(6+4)
	CECTION	
	SECTION B	20 (0.8/1.1
	8	x 20 = 60 Marks
9.	a) Outline the principle and instrumentation technique of SEM.	(10+10)
10	b) Write the applications of superconducting materials.	(10+10)
10.	a) Describe Bardeen-Cooper-Schrieffer theory of superconductivity.b) Elaborate the principle and working mechanism of a photogalvanic cell.	(10+10)
11.		
	a) Explain the principle of biosensor and its applications in cancer diagnosisb) Relate the heat and temperature sensor with suitable working mechanism	
12	a) Describe the formation of silica nanoparticles and their unique properties	· /
14.	b) Specify the synthesis, recycling process of biodegradable polymers.	(10+10)
13	a) Differentiate homopolymer and copolymer with examples.	(10+10)
13.	b) How are the following polymers prepared?	(8+12)
	(i) Buna-S (ii) Polyester (iii) Polyvinyl chloride (iv) Polyethylene	(0.12)
14.	a) Discuss the mechanism of preparation of polypropylene using Ziegler-Natta catalyst.	
	b) Write a short note on the polymer degradation in the presence of oxygen	-
		(10+10)
		,