

Code: 20ME6601

III B.Tech - II Semester – Regular Examinations – JUNE 2023**MICRO AND NANO MANUFACTURING
(HONORS in MECHANICAL ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.

2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1		Summarize any two growth techniques for nano structures with their relative merits and demerits.	L2	CO1	14 M
OR					
2		What are the applications of nanomaterials in mechanical engineering? Explain.	L2	CO1	14 M
UNIT-II					
3	a)	Identify the purpose of SEM? Explain its principle.	L2	CO2	7 M
	b)	Interpret the principle of X-Ray diffraction.	L2	CO2	7 M
OR					
4	a)	Discuss about Atomic force microscope (AFM).	L3	CO2	7 M
	b)	Write about Scanning Probe Microscopy in detail.	L2	CO2	7 M

UNIT-III					
5	a)	With neat sketches explain lithography process.	L2	CO3	10 M
	b)	Write short notes about micro fabrication.	L3	CO3	4 M
OR					
6	a)	Paraphrase the working principle of thin film deposition and doping.	L2	CO3	7 M
	b)	Illustrate various steps in surface micro machining with neat sketches.	L3	CO3	7 M
UNIT-IV					
7	a)	List out various actuation methods used in MEMS. Describe the principles of any two methods with neat sketches.	L2	CO3	7 M
	b)	Elaborate Optical MEMS and RFMEMS.	L2	CO3	7 M
OR					
8	a)	Describe with a neat diagram molecular beam epitaxy.	L3	CO3	7 M
	b)	Restate Template Manufacturing used to fabricate 3-D organic and inorganic structures.	L3	CO3	7 M
UNIT-V					
9	a)	List the advantages, disadvantages and applications of micro grinding process.	L2	CO4	10 M
	b)	Outline few applications in optical manufacturing.	L3	CO4	4 M
OR					

10	a)	Infer the importance of Nano grinding tools.	L2	CO4	4 M
	b)	Elaborate Semiconductor and electronics related applications of ultra-precision processes.	L3	CO4	10 M