

Model Question Paper 2022-23 (CBCS Scheme)
Sixth Semester B.E. Degree Examination (Mechanical Engineering)

MEMS and Microsystem Technology

TIME: 03 Hours

Max. Marks: 100

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.
 02. M: Marks, L: Blooms Level, C: Course outcomes

Q. No.	Questions		M	L	CO
MODULE-1					
Q.1	a.	Define MEMS. Explain the difference between Microsystems and MEMS.	10	L2	CO1
	b.	Explain the applications of Smart Materials & Microsystems.	10	L2	CO2
OR					
Q.2	a.	Explain why miniaturization is important in modern engineering applications.	10	L2	CO1
	b.	Explain integrated microsystems.	10	L2	CO2
MODULE-2					
Q.3	a.	Define an actuator in the context of smart systems. Explain how an inkjet print head functions.	10	L2	CO1
	b.	Explain the advantages and applications of Piezoresistive Pressure Sensor.	10	L3	CO2
OR					
Q.4	a.	Explain the working principle of Micropump in the context of smart systems.	10	L2	CO1
	b.	Compare silicon capacitive accelerometers and piezoresistive pressure sensors based on sensitivity.	10	L3	CO2
MODULE-3					
Q.5	a.	With neat sketches explain the principle of photolithography.	10	L2	CO1
	b.	Differentiate between bulk micromachining and surface micromachining.	10	L3	CO2
OR					
Q.6	a.	With a neat sketch explain the principle of Chemical Vapor Deposition technique.	10	L2	CO1
	b.	Compare dry etching and wet etching techniques in micromachining.	10	L3	CO2

MODULE-4					
Q.7	a.	Write a note on OpAmp based circuits.	10	L2	CO1
	b.	Define Schottky diode. Explain the difference between a normal diode and a Schottky diode.	10	L3	CO3
OR					
Q.8	a.	Explain the working principle of a tunnel diode.	10	L2	CO1
	b.	Distinguish between depletion-mode and enhancement-mode MOSFETs.	10	L3	CO3
MODULE-5					
Q.9	a	Explain the steps for implementing a PID controller in a MEMS-based device.	10	L2	CO1
	b	Explain the working principle behind vibration control in smart structures.	10	L2	CO4
OR					
Q.10	a	Explain the Prime design considerations when developing an integrated microsystem.	10	L2	CO1
	b	Explain the key performance parameters of the BEL pressure sensor.	10	L2	CO4