Register Number:……..

B.E DEGREE EXAMINATIONS: NOV/DEC 2024

(Regulation 2018)

Fourth Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

U18EIT4004**:** MEMS and Sensor Design

COURSE OUTCOMES

CO1: Comprehend the Fundamentals of the fabrication techniques behind the successful MEMS devices.
CO2: Appreciate the importance of micro fabrication.
CO3: Comprehend the principles of nano fabrication techniques and typical clean room.
CO4: Comprehend the Fundamentals of the fabrication techniques behind the successful MEMS devices.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	Mention the components of MEMS system	CO1	[K_1]
2.	List few successful MEMS products	CO2	[K_2]
3.	Outline the hierarchy of MEMS.	CO1	[K_1]
4.	What are the limitations of wet etching process?	CO2	[K_2]
5.	Recall on positive and negative photoresistive.	CO3	[K_1]
6.	State diffusivity and step coverage.	CO3	[K_2]
7.	Outline the lithography technique used in fabrication of MEMS devices.	CO2	[K_1]
8.	Mention the steps involved in fabricating piezo resistive pressure sensor.	CO4	[K_2]
9.	List the materials used for fabricating capacitive microphone.	CO3	[K_1]
10.	Recall on TEM analysis of MEMS sensor.	CO4	[K_2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	Discuss the steps involved in simulation and TEM analysis of Capacitive accelerometer sensor using CAD tool.	16	CO1	[K_3]
12.	What is meant by photolithography? Recall the steps involved in lithography process with a neat sketch.	16	CO2	[K_3]

13.		Outline the following two PVD process 1. Thermal evaporation 2. Sputtering	16	CO3	[K_4]
14.	a)	Explain the steps involved in surface micromaching process with a neat sketch.	8	CO4	[K_3]
	b)	Outline the difference between IC technology and MEMS technology	8	CO1	[K_3]
15.		Elaborate on the working and fabrication of capacitive microphone device with a neat sketch	16	CO4	[K_4]
16.	a)	Elaborate the plasma ion beam etching process used in MEMS	8	CO3	[K_3]
	b)	Write short note on the etch stop techniques of removing materials during microsystem fabrication.	8	CO3	[K_4]

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