Register Number:……..

KUMARAGURU
college of technology
character is life

B.E/B.TECH DEGREE EXAMINATIONS: APRIL / MAY 2023

(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.
CO2: Appreciate the importance of micro fabrication.
CO3: Comprehend the principles of nano fabrication techniques and typical clean room.
CO4: Apply the principal mechanisms of thin film deposition, lithography, arching and other techniques.

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

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

1.	List out the components of a smart sensor.	CO1	[K_1]
2.	Mention the applications of MEMS.	CO1	[K_1]
3.	Differentiate CVD and PVD process.	CO2	[K2]
4.	Define diffusion and oxidation.	CO2	[K1]
5.	Outline the working of electron beam lithography.	CO3	[K_1]
6.	Compare bulk and surface micromachining.	CO3	[K_2]
7.	How position can be measured using accelerometer.	CO4	[K_2]
8.	Define signal to noise ratio.	CO4	[K1]
9.	Draw the basic components of hydraulic systems.	CO4	[K_2]
10.	List out the steps involved for in fabrication of diaphragm.	CO4	[K_2]

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

11.	a)	Explain in detail about different approaches used to design of MEMS sensors.	10	CO1	[K_2]
	b)	Write short notes on Micro systems and smart systems.	06	CO1	[K_2]
12.		With neat sketch explain the principles of CVD process for the fabrication of microsystem.	16	CO2	[K_2]

13.		Illustrate with example of different types of PVD process involved in fabrication process.	16	CO2	[K_2]
14.	a)	Explain in detail about the principle and construction of static accelerometer.	12	CO3	[K2]
	b)	State its advantages, disadvantages and applications of accelerometer.	04	CO3	[K_1]
15.		Write short notes on i. Hydraulic fluid power measurement ii. Hydraulic piezoresistive materials.	16	CO4	[K_2]
16.		Elucidate in detail about stress analysis, Signal conditioning and Calibration methods of piezoresistive pressure sensor.	16	CO4	[K_2]

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