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BTECH
(SEM VII) THEORY EXAMINATION 2024-25
MICRO & SMART SYSTEMS

TIME: 3 HRS

M.MARKS: 100

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt all questions in brief. 2 x 10 = 20

Q no.	Question	CO	Level
a.	List any two applications of Microsystems.	CO1	K1
b.	What are conductometric gas sensor?	CO2	K1
c.	Name some Micromachining technologies.	CO3	K1
d.	What is electrostatic?	CO4	K1
e.	Discuss in brief about Scaling effects in Microsystems.	CO5	K1
f.	What is micro and nanofabrication?	CO1	K1
g.	What are the different types of microsensors?	CO2	K1
h.	Discuss lithography in brief.	CO3	K1
i.	What is meant by pull-in voltage?	CO4	K1
j.	What do you mean by diffusion?	CO5	K1

SECTION B

2. Attempt any three of the following: 10 x 3 = 30

a.	Write a short note on (i) smart materials, (ii) integrated Microsystems.	CO1	K2
b.	Explain Silicon capacitive accelerometer and piezo-resistive pressure sensor in detail.	CO2	K2
c.	Write a short note on (i) thin film deposition, (ii) etching.	CO3	K2
d.	Describe the the anticlastic curvature of beams and torsion of beams.	CO4	K2
e.	What is Integrated Microsystem? Also, discuss the process of microsystems packaging in detail.	CO5	K2

SECTION C

3. Attempt any one part of the following: 10 x 1 = 10

a.	Explain Miniaturization process in detail. What is the Need of miniaturization?	CO1	K2
b.	Compare & Elaborate Microsystems versus MEMS with all detail.	CO1	K2

4. Attempt any one part of the following: 10 x 1 = 10

a.	Write short note on (i) portable blood analyzer, (ii) piezoelectric inkjet print head.	CO2	K2
b.	Explain in detail about micro-mirror array for video projection.	CO2	K2

5. Attempt any one part of the following: 10 x 1 = 10

a.	Discuss silicon micromachining in detail. What are specialized materials for Microsystems?	CO3	K2
b.	Describe advanced processes for micro fabrication with all detail.	CO3	K2

6. Attempt any one part of the following: 10 x 1 = 10

a.	Write short note on (i) Bimorph effect, (ii) Residual stress and stress gradients, (iii) Poisson's effect.	CO4	K2
b.	What are Coupled Electro-mechanics? Also discuss Squeezed film effects in electro-mechanics.	CO4	K2

7. Attempt any one part of the following: 10 x 1 = 10

a.	Elaborate the Scaling effects in Microsystems with focus on scaling in electrostatic domain and magnetic domain.	CO5	K2
b.	Discuss the case study of a smart-structure in vibration control.	CO5	K2