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IV B.Tech I Semester Regular/Supplementary Examinations, Oct/Nov - 2018 MICRO ELECTRO MECHANICAL SYSTEMS

Time: 3 hours

(Mechanical Engineering)

Max. Marks: 70

Question paper consists of Part-A and Part-B Answer ALL sub questions from Part-A Answer any THREE questions from Part-B *****

PART-A (22 Marks)

1.	a)	Define MEMS.	[3]
	b)	Write about peltier effect.	[4]
	c)	What are the applications of MOEMS?	[3]
	d)	Write the functions of magneto transistor.	[4]
	e)	Write the considerations on micro scale fluid.	[4]
	f)	Write the limitations of chemical micro systems.	[4]
		<u>PART-B</u> $(3x16 = 48 Marks)$	
2.	a)	Explain about structural and sacrificial materials.	[8]
	b)	Describe the MEMS gyroscopes.	[8]
3.	a)	Explain about thermal flow sensors and micro hot plate gas sensors.	[8]
	b)	Describe U-shaped horizontal and vertical electro thermal actuator.	[8]
4.	a)	Explain about light modulators and beam splitter.	[8]
	b)	Describe about wave guide and tuning.	[8]
5.	a)	Describe about magneto resistive sensor.	[8]
	b)	Explain about large force reluctance actuator.	[8]
6.	a)	Explain about dielectro phoresis (DEP).	[8]
	b)	Describe about RF MEMS and MEMS inductors.	[8]
7.	a)	Explain about chemo capacitors in detail.	[8]
	b)	Write about electronic nose (E-nose).	[8]

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Set No. 2

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Time: 3 hours

(Mechanical Engineering)

Max. Marks: 70

Question paper consists of Part-A and Part-B Answer ALL sub questions from Part-A Answer any THREE questions from Part-B *****

PART-A (22 Marks)

1.	a)	Write the history of MEMS.	[3]
	b)	What is the importance of pyro electricity?	[4]
	c)	Write the properties of light.	[3]
	d)	What are the applications of magnetic sensors?	[4]
	e)	Write the applications of micro fluidic systems.	[4]
	f)	Write the advantages of bio medical micro systems.	[4]
		PART-B $(3x16 = 48 Marks)$	
2.	a)	Explain about thin film deposition, impurity doping and etching.	[8]
	b)	Describe about shear mode piezo actuator and gripping piezo actuator.	[8]
3	a)	Explain about thermo couple and micro machined thermo couple probe.	[8]
	b)	Describe about MEMS thermo vessels.	[8]
Δ	a)	Explain the principle of MOEMS technology in detail	[8]
	h)	Explain about shear stress measurement	[8]
	0)	Explain about shear stress measurement.	[0]
5.	a)	Write about mag MEMS actuators and by directional micro actuator.	[8]
	b)	Describe about magneto diodes and magneto transistor.	[8]
	,		
6.	a)	Explain about fluid actuation methods.	[8]
	b)	Describe the RF – based communication systems.	[8]
7.	a)	Explain about membrane-transducer materials.	[8]
	b)	Describe about calorimetric spectroscopy.	[8]

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Set No. 3

IV B.Tech I Semester Regular/Supplementary Examinations, Oct/Nov - 2018 MICRO ELECTRO MECHANICAL SYSTEMS

Time: 3 hours

(Mechanical Engineering)

Max. Marks: 70

Question paper consists of Part-A and Part-B Answer ALL sub questions from Part-A Answer any THREE questions from Part-B *****

PART-A (22 Marks)

1	\sim	Write the development of MEMS	Г <i>4</i> Т
1.	a)	white the development of MEMS.	[4]
	b)	What are the applications of thermal sensors?	[4]
	c)	Write the functions of optical switch.	[3]
	d)	What are the applications of magnetic actuators?	[4]
	e)	Write about electro thermal flow.	[3]
	f)	What are the applications of chemo resistors.	[4]
		<u>PART-B</u> $(3x16 = 48 Marks)$	
2.	a)	Explain about surface micro machining and wafer bonding.	[8]
	b)	Describe about capacitive measurement and inchworm technology.	[8]
3	a)	Write about thermistors and thermo devices in detail.	[8]
	b)	Explain about micro spring thermal actuator.	[8]
4.	a)	Describe about micro lens and micro mirrors.	[8]
	b)	Explain about grating light valve (GLV).	[8]
5.	a)	Explain magnetic materials for MEMS and properties.	[8]
	b)	Describe about magnetic probe based storage device.	[8]
6	a)	Explain about electro wetting and electro osmosis flow.	[8]
	b)	Explain about tuner/filter, resonator and clarification of tuner.	[8]
	5)		[0]
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7. a) Describe about chem.-lab-on-a-chip (CLOC) in detail. [8] Write about mass sensitive chemo sensors. b) [8]

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Set No. 4

IV B.Tech I Semester Regular/Supplementary Examinations, Oct/Nov - 2018 MICRO ELECTRO MECHANICAL SYSTEMS

Time: 3 hours

(Mechanical Engineering)

Max. Marks: 70

Question paper consists of Part-A and Part-B Answer ALL sub questions from Part-A Answer any THREE questions from Part-B *****

PART-A (22 Marks)

1.	a)	Define micro machining.	[3]
	b)	What are the applications of thermal actuators?	[4]
	c)	What are the functions of light modulators?	[3]
	d)	Write about hall effect.	[4]
	e)	Write about thermo capillary effect.	[4]
	f)	What are the applications of chemo transistors?	[4]
		PART–B $(3x16 = 48 Marks)$	
2.	a)	Explain principles and methods of lithography.	[8]
	b)	Describe pressure measurement by micro phone.	[8]
3.	a)	Explain about heat transfer processes.	[8]
	b)	Illustrate shape memory alloys (SMA) and data storage cantilever in detail.	[8]
4.	a)	Describe about light detectors.	[8]
	b)	Explain about digital micro mirror device (DMD).	[8]
5.	a)	Explain about magnetic sensing and detection.	[8]
	b)	Describe about feedback circuit integrated magnetic actuator.	[8]
6.	a)	Describe micro fluid dispenser and micro pumps.	[8]
	b)	Explain about MEMS switches and phase shifter.	[8]
7.	a)	Write about sensing mechanism and its principle.	[8]

b) Describe about fluroscence detection. [8]

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