Enrolment No.\_\_\_\_\_

## GUJARAT TECHNOLOGICAL UNIVERSITY M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2013

Subject code: 1720311 Date: 07-			
Subje Time	ect Na : 10.3	ame: Micro-Electromechanical Systems 50 am – 01.00 pm Total Marks: 70	
Instr	nctio	ins:	
111.5 01	1. A	ttempt all questions.	
	2. N	Take suitable assumptions wherever necessary.	
	<b>3.</b> F	igures to the right indicate full marks.	
Q 1	(a)	Explain main basic requirements for smart system.	(5)
	<b>(b)</b>	Explain any three applications of MEMS	(3)
	(c)	Define following terms	(6)
		1. Microsystem	
		2. Microsensor	
•		3. Microactuator	
<b>Q.</b> - 2	(a)	Explain working principle, typical applications, material used, and fabrication process for micro silicon capacitive accelerometer system	(7)
		OR	
	(a)	Explain working principle, typical applications, material used, and fabrication process for micro peizoresistive pressure sensor system	(7)
	<b>(b)</b>	Explain structural difference between electronic components and MEMS	(7)
Q 3	<b>(a)</b>	Explain photolithography process with neat sketch.	(14)
		OR	
Q 3	(a)	Explain the various technological development which contributed in development of MEMS.	(14)
Q. – 4	<b>(a)</b>	Explain chemical vapor deposition process	(7)
	<b>(b)</b>	What are the differences between wet etching and dry etching? What are the advantages offered by dry etching over wet etching?	(7)
		OR	
Q. – 4	<b>(a)</b>	Write short note on LIGA process	(7)
	<b>(b</b> )	Write short note on microelectrical discharge machining	(7)
Q. – 5	<b>(a)</b>	Compare photolithography and soft lithography	(7)
	<b>(b</b> )	Write short note on HexSil process	(7)
		OR	
Q. – 5	(a)	Explain bimorph effect. Explain use of bimorph effect in sensor design. Give reason it is disadvantageous in case of out-of-plane deformation if heterogeneous beam.	(7)
	<b>(b</b> )	Explain various wafer bonding techniques used in fabrication of MEMS	(7)

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