

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Seventh Semester B.Tech Degree Regular and Supplementary Examination December 2021 (2015 Scheme)

**Course Code: MR409****Course Name: Micro Electro Mechanical Systems**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer all questions, each carries 5 marks.*

		Marks
1	Explain how micro-system differs from microelectronics system	(5)
2	Differentiate 3 CVD methods	(5)
3	Briefly explain about the standard clean room for micromachining	(5)
4	Define micro-turning? What are the challenges in micro-turning	(5)
5	With block diagram, explain the principle behind chemical sensors	(5)
6	Define piezoelectric effect. Explain how it can be used to actuate the micro devices	(5)
7	Explain why electromagnetic actuation is not commonly used in microsystem	(5)
8	List the applications of MEMS in aerospace industry	(5)

**PART B***Answer any three full questions, each carries 10 marks.*

9	a) What are the important considerations in MEMS packaging	(4)
	b) Explain the 3 level packaging system	(6)
10	Elucidate the mechanical problems associated with surface micromachining	(10)
11	a) With neat diagram explain LIGA process	(7)
	b) How SLIGA differs from LIGA	(3)
12	a) Explain the principle and working of Laser Beam Machining	(6)
	b) List out its advantages, disadvantages and applications	(4)
13	Explain	(10)
	(i) Precision grinding	
	(ii) Binder less wheels	

**PART C***Answer any two full questions, each carries 15 marks.*

14	a) With neat diagram explain the steps in Photolithography	(10)
	b) Compare Positive and negative photoresists	(5)

- 15 Explain (15)  
(i) Micro valves  
(ii) Micro pumps
- 16 Explain the scaling in? (15)  
(i) Geometry  
(ii) Electrostatic forces
- 17 a) Draw and explain sensors for future vehicles (10)  
b) Explain the applications of microsystem in defence field? (5)

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