

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019**

**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 the properties of MEMS materials                       | (5) |
| 2 | Compare dry and wet etching                                    | (5) |
| 3 | Explain the advantages and disadvantages of micro ECM.         | (5) |
| 4 | What are the fundamental elements in micro milling?            | (5) |
| 5 | Write a review on Acoustic Microsensor with a neat diagram.    | (5) |
| 6 | Illustrate with a neat working diagram of Microvalves.         | (5) |
| 7 | Explain Scaling in electricity.                                | (5) |
| 8 | Explain with a neat block diagram of 'MEMS as a micro sensor'. | (5) |

**PART B**

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

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|----|---|------|
| 9  | Explain about microsystem packaging   | (10) |
| 10 | a) Draw and explain Block diagram of LIGA process                           | (5)  |
|    | b) Explain different steps in LIGA process                                  | (10) |
| 11 | a) Explain the working of electrical discharge machining with neat sketch.  | (6)  |
|    | b) Write the advantages and disadvantages of electrical discharge machining | (4)  |
| 12 | Explain the fundamentals and applications of micro turning.                 | (10) |
| 13 | Explain the principle of precision grinding process with a neat diagram     | (10) |

**PART C**

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

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|----|---------------------------------|------|
| 14 | a) Write a short note on        | (10) |
|    | I. Micro grippers               |      |
|    | II. Micro motors.               |      |
|    | b) Explain Thermal Microsensor. | (5)  |

- 15 Discuss actuation using (15)
- I. Shape memory alloys.
  - II. Piezo electric crystals.
- 16 List and explain various applications of MEMS. (15)
- 17 a) Discuss on Scaling in Electrostatic forces. (7)
- b) Discuss on Scaling in Electromagnetic forces. (8)

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