

Total No. of Questions : 8]

SEAT No. :

**PD4448**

**[6403]-253**

[Total No. of Pages : 2

**T.E. (Robotics and Automation)**

**MICRO ELECTRO MECHANICAL SYSTEM**

**(2019 Pattern) (Semester - VI) (311511-(A)-I) (Elective - II)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right side indicate full marks.*
- 4) *Assume Suitable data if necessary.*

**Q1) a) Discuss key components of magnetic actuators. [9]**

**b) Explain working principle of thermal resistors. [8]**

OR

**Q2) a) Compare parallel plate capacitor to inter digitated finger capacitor. [9]**

**b) Explore various applications of micro grippers. Elaborate any two applications in detail. [8]**

**Q3) a) Explain how MEMS based sensors and actuators are contributing to the development of smart cities. [9]**

**b) Write characteristics of selection of piezoresistive sensors. [8]**

OR

**Q4) a) Brief working principle of tactile and flow sensors. [9]**

**b) Describe challenges associated with stress analysis of mechanical elements in MEMS. [8]**

**P.T.O.**

- Q5) a)** Discuss the role of polymers in MEMS. Describe its applications. [9]
- b)** Explain the concept of optical MEMS. How it is important in semiconductor industry. [9]

OR

- Q6) a)** Compare characteristics of SU-8, Liquid crystal polymer and parylene with each other [9]
- b)** Write a short note on Lenses and Mirrors. [9]

- Q7) a)** Write a short note on.: Wireless cameras and voice transmission. [6]
- b)** Elaborate case study related to metal detector. [6]
- c)** Brief on Acceleration sensor. [6]

OR

- Q8) a)** Explain concept of Zigbee. [6]
- b)** Why acceleration sensors are essential in cellphone? Elaborate it. [6]
- c)** Write a short note on.: Blood pressure sensor. [6]

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