

Total No. of Questions : 8]

PE2695

SEAT No. :

[Total No. of Pages : 2

[6583]-245

T.E. (Robotics and Automation)

MICRO ELECTRO MECHANICAL SYSTEMS

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

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer 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 indicate full marks.
- 4) Assume suitable data if necessary.

Q1) a) What is the principle of electrostatic sensor? What do electrostatic sensors measure? [9]

b) Discuss key components of magnetic actuators. [8]

OR

Q2) a) Explain significance of thermocouple in MEMS also classify thermocouples. [9]

b) Explore various applications of micro motors. 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) Brief on various applications of flow sensors. [8]

OR

Q4) a) Brief working principle of acoustic sensor. What are the advantages and limitation of acoustic sensor? [9]

b) Describe methods associated with stress analysis of various elements in MEMS. [8]

P.T.O.

- Q5)** a) Classify types of polymers. State mechanical and chemical properties of various polymers. [9]
- b) Explain the concept of optical MEMS. How it is important in semiconductor industry. [9]

OR

- Q6)** a) Explain applicability of Liquid crystal polymer and parylene. Also write advantages and limitations. [9]
- b) Write a short note on SU-8 with its product characteristics. [9]

- Q7)** a) Why acceleration sensors are essential in semiconductor industry? Elaborate its significance. [6]
- b) Elaborate case study related to acceleration sensor. [6]
- c) Brief on Metal detector. How it is applicable in defense sector? [6]

OR

- Q8)** a) Explain concept of Gyros. [6]
- b) Write a short note on.: Ultrasonic Distance Ranging Sensors. [6]
- c) Write a case study related to microphone. [6]

