Code: 15A04506 **R15**

B.Tech III Year I Semester (R15) Regular Examinations November/December 2017

MEMS & MICROSYSTEMS

(Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) What is micromachining?
(b) What is meant by Seebeck effect?
(c) List the limitations of doping selective etching.
(d) Mention the merits of surface micromachining.
(e) List the types of mechanical microsensors.
(f) What is meant by differential temperature technique?
(g) Define mass ratio of propulsion system.
(h) Define damping factor of second order system.
(i) List out the applications of carbon nanotubes.
(j) List the advantages of plastics.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Explain in detail about Silicon-Compatible material system.

OR

3 Discuss the effect of piezoresistivity and piezoelectricity.

UNIT – II

4 (a) Explain in detail about chemical vapor deposition and its applications.
(b) Explain the steps involved in lithography using lift-off technique.

OR

5 (a) Discuss about microstereolithography for MEMS.
(b) Write short notes on quartz micromachining.

UNIT – III

6 (a) Explain in detail about MEMS pressure sensors with neat diagrams.
(b) Write short notes on Bolometer detector.

OR

7 (a) Discuss the design aspects of flow sensor using the thin film anemometer.
(b) Explain the basic principle of micro-gyrometer.

UNIT – IV

8 (a) Explain the temperature drift in piezoresistive accelerometer.
(b) Write notes on micro machined tunneling accelerometer.

OR

9 Explain the basic principle and performance of capacitive accelerometer.

UNIT – V

10 (a) Discuss the features, issues and challenges of polymer MEMS.
(b) Explain the silicon fusion bonding mechanism.

OR

11 (a) Explain the role of interfacing electronics with integrated MEMS sensors.
(b) Write notes on Bio-MEMS.

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