Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

SEVENTH SEMESTER B.Tech. (E & C) DEGREE END SEMESTER EXAMINATION
NOV/DEC 2017
SUBJECT: MEMS (ECE - 4027)

TIME: 3 HOURS **MAX. MARKS: 50**

Instructions to candidates

- Answer **ALL** questions.
- Missing data may be suitably assumed.

1A. Explain how deep X-ray lithography can be utilised for fabrication of moulds with deep trenches.

1B. How can a microfluid is protected from environmental degradation while it is flowing in a Si microchannel. Explain the technique.

1C. What are advantages of PDMS in realising microstructures by soft lithography

(3+4+3)

2A. Explain a phenomenon by which the liquid flow (velocity) be increased by applying electric field.

2B. Explain surface tension and how can it be utilised to actuate a liquid droplet. Indicate how the tunability of the actuation be achieved.

2C. Draw schematic of two MEMS tuners for RF receivers

(4+4+2)

3A. Define quality factor of an inductor and plot its dependence on frequency in Giga Hertz region.

3B. Explain principle and working of varactors. How micro technology be utilised to fabricate varactors.

3C. Explain two CVD techniques for fabrication of semiconductor thin films. Compare their advantages.

(2+5+3)

4A. Explain principle and working of a device based on diffraction phenomena for image processing applications.

4B. What are limitations of conventional MEMS to be utilised in Robotics. Which material is best suited for Robotics and explain suitable properties of those materials.

4C. Draw schematic of two MEMS optical switches.

(4+4+2)

5A. Explain how spherical microlenses can be fabricate by MEMS technology and explain two important applications.

5B. What are the factors that are to be considered for designing a microfluic devices?

5C. Name two materials and their suitable properties for utilisation as sacrificial layers.

(5+2+3)