Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
Manipal University

SIXTH SEMESTER B.TECH (E & C) DEGREE END SEMESTER EXAMINATION
APRIL/MAY 2017
SUBJECT: BioMEMS AND MICROSENSORS (ECE -322)

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

Instructions to candidates
- Answer **ANY FIVE** full questions.
- Missing data may be suitably assumed.

1A. Explain a technique for alternative to bulk micro machining. Bring out utilization of different materials in this process.

1B. With neat schematics describe two CVD techniques. Compare and contrast those two techniques with PVD techniques.

1C. Explain how real estate be saved in bulk-micro machining.

(4+3+3)

2A. Explain the following: a) Surface tension. b) Dielectro-Opto wetting

2B. With neat diagram explain electrospray ionising system to analyse chemical / biological analytics by using Mass spectrometry.

(5+5)

3A.
a) Micro-needles are --- drug delivery devices.
b) Neumann formula is ----------
c) Principle of dielectrophoresis is ----------
d) In Raman scattering, the scattered light has --- components

3B. Describe fabrication and working of the Inter Digital Transducer (IDT) in SAW sensors

(4+6)

4A. Describe with a clear flow chart the concept of bio-sampling and immune assay procedure in a Lab-On-Chip devices.

4B. Describe the nano-sphere lithography (NSL) technique to fabricate nano-structures on a given substrate. How the procedure be modified to obtain different shape nano-structures?

(5+5)

5A. Discuss how the concept of Lab-On-Chip be applied to analyse the blood samples for their oxygen partial pressure, glucose and lactose.

5B. Describe the electronic nose. Describe its applications in various fields.

(6+4)

6A. Describe the following: a) Calorimetric spectroscopy. b) Continuous flow micro-pumps.

6B. Explain mechanisms involved in dry etching techniques and its advantage over wet etching.

(5+5)