Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

VII SEMESTER B.TECH. (MECHANICAL & IP ENGINEERING)

END SEMESTER MAKE UP EXAMINATIONS, DEC 2016/JAN 2017

SUBJECT: NANOTECHNOLOGY [MME 451]

REVISED CREDIT SYSTEM

(02/01/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE FULL** questions.

1A.	Sketch and explain chemical vapor deposition	**05**
1B.	Write a note on future trends in nanotechnology	**03**
1C.	Sketch and explain electric field evaporation of specified atoms	**02**
2A.	Sketch and explain the working principle of high precision optical surface sensor	**03**
2B.	Explain semi-closed and fully closed loop control system used in a numerical control system	**03**
2C.	Sketch and explain the fabrication process of optical fiber	**04**
3A.	Explain the working principle of scanning tunneling microscope and explain its two modes of operations	**03**
3B.	Sketch and explain the working principle of harmonic gear	**03**
3C.	With respect to nano-lithography explain the following terms (a) positive resist and negative resist (b) thermodynamic resist and kinetic resist	**04**
4A.	Differentiate between atomic bit processing and atom cluster processing of materials	**02**
4B.	Explain the modes of operation of transmission electron microscope	**03**
4C.	With block diagram explain the servo control system for tool positioning of nanometre accuracy	**05**
5A.	What are diffraction gratings? How are holographic gratings fabricated?	**04**
5B.	Explain the generation and control of electron beam in a scanning electron microscope	**04**
5C.	Sketch and explain elastic hinge	**02**

6A.	Sketch and explain the table slide hydraulic guide system	**03**
6B.	Sketch and explain the manufacturing process of ultra-precision block gauges	**04**
6C.	Sketch and explain the working of circular path interferometer	**03**