

MANIPAL INSTITUTE OF TECHNOLOGY MANIPAL

A Constituent Institution of Manipal University

VII SEMESTER B.TECH. (MECHANICAL ENGINEERING & IP) END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: NANOTECHNOLOGY [MME 451]

REVISED CREDIT SYSTEM (30/11/2016)

Time: 3 Hours

MAX. MARKS: 50

Instruction to Candidates:

Answer ANY FIVE FULL questions.

1A. 1B. 1C.	Sketch and explain ion sputter machining process Write a note on future trends in nanotechnology Sketch and explain molecular beam epitaxy	05 03 02
2A. 2B. 2C.	Sketch and explain the working of high precision optical surface sensor Elaborate the basic design requirements for a numerical control system that achieves nanometer resolution Explain the manufacturing process of ultra-precision balls for roller bearings	03 03 04
3A. 3B. 3C.	Explain the force regimes and modes of operation in Atomic Force Microscopy Sketch and explain nano-glassy servo system Sketch and explain Electrolytic In-process Dressing of metal bonded diamond	03 03 04
4A. 4B.	State the applications of turning, grinding, lapping & polishing in Nano- machining Sketch and explain the modes of operations of transmission electron microscope	02 03
4C.	Explain the leftward movement and rightward movement of Piezo Impact Drive Mechanism? State its applications	05

5A. 5B 5C.	Describe the Nano-lithography resist process What are backscattered electrons and secondary electrons? State their applications in the field of Nano-characterization Discuss the feasibility of using Linear Slide Guide for Nano-positioning	05 03 02
6A.	Sketch and explain the fabrication process of optical fibers	04
6B.	Sketch and explain actively controlled aerostatic slides	03
6C.	Sketch and explain the Everhart-Thornley secondary electron detector	03