Micro and Nano Manufacturing (MEL433)	B.Tech., MAJOR
Max.Marks :100	Date: 27-11-06 Time: 1.00 p.m. -3.00 p.m.

Descriptive Type

Neat sketches and drawings are necessary (wherever applicable)

1	Explain the process capabilities of following methods in fabricating nano scopic form	
	(a) Vapor Deposition	(3)
	(b) Sol-Gel Synthesis	(3)
	(c) Mechanical milling	(3)
2	How do you obtain nano size metal powder? Explain the process.	(1+3)
3	List the significance of ultra fine grain structure and explain any one Severe Plastic Deformation process.	(4+8)
4	Why Ga ion source is used in FIB? Explain the FIB system & process parameters	(4+5+3)
5	Briefly explain the ion implantation process and discuss its applications in semiconductor and cutting tool industries.	(4+6)
6	How do you fabricate PMMA micro array of Lenses?	(5)
7	Explain AFM and Discuss the effect of AFM tip and modes of contact on lateral resolution.	(5+5)
8	List the properties of Diamond and explain the process of manufacturing diamond thin films and discuss its applications.	(3+7+3)
9	Explain "Add, Alter & Remove" Processes in IC Manufacturing	(5+5+5)

10	Give Short Answers	
(a)	Compare wet aud Dry etching	2
(b)	What is nano imprinting process	2
(c)	How nano scratching technique replaces the photo resist in silicon grooving.	1
(d)	How do you prepare TEM specimen	1
(e)	List the methods of making silicon cantilever for micro sensor	1
(f)	What is cold laser	1
(g)	What do you mean by "Litho" graphy	1
(h)	List the factors affecting the thickness of spin coated resist.	1