R 2004

B.E/ B.Tech DEGREE EXAMINATIONS, April/May 2011

Fifth Semester

Manufacturing Engineering

MN373 –PRECISION ENGINEERING AND NANO TECHNOLOGY

Time: 3 hours **Maximum:100**

Marks

Answer ALL questions

PART A-(10 × 2 = 20 marks)

1. What do you mean by "form error" in measurement?
2. Write short on part accuracy.
3. Write short note on design of shaft for precision drives
4. List any four types of bearings used in precision machine tools.
5. Distinguish between wet etching and dry etching.
6. Discuss on clean room in precision machining.
7. What do you mean by nano particle?
8. Describe briefly any two image defects in AFM.
9. State any four applications of Nano tubes.
10. Write short note on nano grating system?

PART –B (5 ×16 = 80 marks)

11. i)Explain the concept of single wall carbon nano tubes and the method of producing it. (10)

    ii) What do you meant by self assembly? Explain. (6)

12. a. i) Explain with suitable example the principles of measurement. (8)

    ii) Briefly explain about the significance of spindle rotation error for some

basic machine tools. (8)

Or

b. i) Explain about the technique of measurement of straightness of motion of a body in listing machine tool accuracy. (8)

ii) Enumerate the basic components of displacement error. (8)

13. a. Sketch any four types of guide ways of precision machine slides and explain their advantages, limitations and applications. (16)

Or

b. i) Discuss about servo control system used for tool positioning. (8)

ii)Explain with suitable diagram any one type of CMM. Also indicate advantages and limitations. (8)

14. a.i) What do you mean by nano robot? Explain. (8)

ii) Explain precision machining moulding and casting with suitable example product. (8)

Or

b.i) Discuss on tool based micromachining considering micro WEDM and EDG operation. (8)

ii) Explain about the process of electron beam lithography. (8)

15.a. i) Explain about the applications of non-contact measuring systems in nano technology. (8)

ii) Write short note on 1.Quantum dots 2.Nano indentation. (8)

Or

b) Explain the following with their applications: (16)

i) Scanning Probe Microscopy (SPM) ii) Scanning Tunneling Mode(STM)
