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B.E (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2012

Manufacturing Engineering

Fifth Semester

MN 371 ENGINEERING METROLOGY

(Regulations 2004)

Duration: Three hours

Max. Marks: 100

Answer ALL questions:

PART A (10 x 2 = 20 marks)

1. List any four needs for measurements.
2. How overall sensitivity is measured if individual sensitivities are given?
3. Write any four high resolution devices.
4. What are the requirements of gauge materials?
5. What are the effects of pitch error?
6. Define secondary texture of a surface?
7. Write the characteristic of laser beam
8. What is meant by infereometry?
9. What are the applications of CMM?
10. Define Nanometrology.

PART B (5 x 16 = 80 marks)

11. (i) Explain Input function and types of input. (8)
(ii) Describe Systematic errors. (8)
12. a. Explain the principle and operation of pneumatic comparator in detail. (16)
Or
b. (i) With a neat sketch, explain the principle and construction of different bevel protractors. (12)
(ii) How tapered holes are being measured? (4)
13. a. (i) Explain how spur gear measurements are made. (8)

(ii) Describe the procedures adopted for measuring radius of a conclave surface. (8)

Or

b. (i) Describe straightness and explain in detail any one of the straightness measuring methods. (12)

(ii) List the different roundness measuring devices. (4)

14. a. (i) Describe the working principle of Michelson interferometer with a neat sketch. Discuss the applications of laser interferometer. (12)

(ii) What is optical flat and what are their types. (4)

Or

b. Explain in detail, how a lathe alignment is being performed. (16)

15. a. (i) Explain the calibration procedures adopted in coordinating measuring machine. (8)

(ii) Explain the different machine vision systems. (8)

Or

b. (i) Explain the working principle of any one computer inspection method in detail. (10)

(ii) How nano scale components are being measured. (6)