

CBCS SCHEME

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17MR36

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Measurement and Metrology

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define Metrology. What are the objectives of metrology? (08 Marks)
b. Explain the wringing phenomena of slip gauges with neat figure. (06 Marks)
c. Explain Line standard, End standard, wavelength standard. (06 Marks)

OR

- 2 a. Using M11² set, of slip gauges build the following dimension with protector blocks at both ends of 2.5mm blocks individually i) 35.4875mm ii) 92.357mm. (06 Marks)
b. Explain how Sine Bar can be used to measure unknown angles. (07 Marks)
c. Explain the working principle of Autocollimator with a neat sketch. (07 Marks)

Module-2

- 3 a. What are the various types of fits used for the purpose of assembly of machine parts? Explain each with neat diagram. (10 Marks)
b. With neat figure, explain: i) Plug gauges ii) Ring gauges iii) Snap gauges. (10 Marks)

OR

- 4 a. How the comparators are classified? (04 Marks)
b. Explain with a neat sketch, the construction and working of LVDT. (08 Marks)
c. Sketch and explain Sigma comparator. (08 Marks)

Module-3

- 5 a. Explain with a neat sketch floating carriage diameter measuring machine to measure major diameter of an external thread. (08 Marks)
b. How do you find effective diameter of a screw thread using three wire methods? (06 Marks)
c. With a neat sketch, explain Tool Maker's Microscope. (06 Marks)

OR

- 6 a. Define following Terminology of Gear Teeth.
i) Base circle ii) Pressure Angle iii) Circular pitch iv) Module. (06 Marks)
b. Derive constant chord method to determine individual elements of a gear. (08 Marks)
c. Explain with a neat sketch Rolling Gear Test to determine composite errors in a spur gear. (06 Marks)

Module-4

- 7 a. Explain various stages of a generalized measurement system. Give an example. (10 Marks)
b. Define: Hysteresis, Accuracy, Precision, Loading effect. (06 Marks)
c. Give advantages of Electrical Transducer. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 8 a. Explain the principle of capacitive type electrical transducer. With a sketch explain any two types of capacitive transducer. (10 Marks)
- b. Explain with a neat sketch, Ballast circuit. (06 Marks)
- c. State the advantages of electrical signal conditioning elements. (04 Marks)

Module-5

- 9 a. Sketch a proving ring and explain how it is used for force measurement. (06 Marks)
- b. How are dynamometers classified? Explain with a sketch Prony Brake dynamometer. (08 Marks)
- c. With a neat sketch, describe the Pirani gauge used for pressure measurement. (06 Marks)

OR

- 10 a. Explain the working principle of optical pyrometer. (08 Marks)
- b. What is a thermocouple? State the laws of thermocouple. (06 Marks)
- c. Write a brief description about electrical resistance strain gauge. (06 Marks)
