

CBCS Scheme

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15MA46

Fourth Semester B.E. Degree Examination, June/July 2018 Mechanical Measurements and Metrology

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Define metrology and mention the objectives of metrology. (06 Marks)
b. Explain material and wavelength standards. (10 Marks)

OR

- 2 a. Explain with neat sketch the principle of wringing. (06 Marks)
b. Explain the uses of sine bar. (06 Marks)
c. Explain the principle of auto collimator. (04 Marks)

Module-2

- 3 a. Define the following: i) Limits ii) Fit iii) Tolerance iv) Fundamental deviation. (04 Marks)
b. Explain the principle of inter changeability. (04 Marks)
c. Explain with neat sketches : i) Plain plug gauge ii) Ring gauge. (08 Marks)

OR

- 4 a. What are comparators? Explain three important components of a comparator. (06 Marks)
b. With neat sketch explain Johrson Mikrokator. (06 Marks)
c. Explain the principle of back pressure gauge. (04 Marks)

Module-3

- 5 a. With a neat sketch explain bench micrometer. (08 Marks)
b. Explain with neat sketch Parkinson gear tester. (08 Marks)

OR

- 6 a. With a neat sketch explain interferometer applied to flatness testing. (08 Marks)
b. With a sketch explain co-ordinate measuring machine and its applications. (08 Marks)

Module-4

- 7 a. Define the following : i) Accuracy ii) precision iii) repeatability iv) hysteresis v) threshold vi) resolution. (06 Marks)
b. Explain with sketches : i) photo electric transducer ii) photo conductive transducer iii) photo voltaic cells. (10 Marks)

OR

- 8 a. With sketches explain piezo-electric effect and modes of operation of piezoelectric crystals. (08 Marks)
b. Explain with neat sketch stylus – type oscillograph. (08 Marks)

Module-5

- 9 a. With a neat sketch explain proving ring. (06 Marks)
b. Explain with examples the different types of dynamometer. (06 Marks)
c. Write a note on electrical resistance strain gauges. (04 Marks)

OR

- 10 a. How resistance bridge arrangement is used for strain measurement. (06 Marks)
b. Explain with neat sketch laws of thermocouples. (06 Marks)
c. What are the steps to be followed for proper mounting of strain gauges? (04 Marks)

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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.