Roll No. | | | | | | | | | | |

B.E/B.Tech (FT) END SEMESTER EXAMINATIONS, April / May 2019

MECHANICAL ENGINEERING
V Semester

ME 8502 METROLOGY and MEASUREMENTS
(Regulations 2013)

Time: 3 Hours | Answer ALL Questions | Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Define measurement uncertainty.
2. Distinguish Measurement and Gauging,
3. What are the various types of angular measuring instruments?
4. What are the materials used for making gauge blocks.
5. Brief alignment test on Machine tools.
6. What is meant by "qualifying the tip" in CMMs.
7. What is the 'best size wire' for checking the effective diameter of a M10 x 2.5 thread?
8. Distinguish assessment length and traverse length in surface finish.
9. Give the principle of hot wire anemometer.
10. What type of temperature measurement sensor is used in water heater and AC?

Part – B (5 x 16 = 80 marks)
(Question No.11 is Compulsory)

11. (i) Explain the various systematic and random errors in measurements. (6)
(ii)What is the need of calibration? Explain the classification of various measuring methods. (10)

12. a) What is auto collimator? With neat sketch explain the working principle of micro optic auto collimator? (16)

(OR)

b) Explain the various errors in measurements and the good practices which need to be followed to minimize them. (16)

13. a) Explain the working principle of AC LASER interferometer and how the straightness is measured? (16)

(OR)

b) With neat sketch explain the various types of CMM based on its construction. Also Write the advantages of computer aided inspection. (16)

14. a) (i) Explain the principle of checking the involute profile of gear tooth. (8)

(ii) Explain one method of assessing the straightness of a straight edge. (8)

(OR)

b) (i) Describe a gear tooth Vernier caliper and explain its use for checking tooth thickness and depth of tooth. (8)

(ii) Derive the formula for measuring the effective diameter of thread by 3-wire method. (8)

15. a) With neat diagram explain the construction and working principle of the following.

(i) Rotameter (ii) Orifice meter.

(OR)

b) With neat diagram explain the construction and working principle of the following.

(i) Pyrometers. (ii) Thermocouple

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