

CBCS Scheme

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Third Semester B.E. Degree Examination, Dec.2016/Jan.2017 Mechanical Measurements & Metrology

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- Draw a block diagram of a generalized measurement system. Explain the function performed by each element. (10 Marks)
 - What are the different sources of errors in measurement? Explain in brief. (06 Marks)

OR

- Explain the following with neat sketches :
 - Imperial standard yard.
 - International prototype metre. (08 Marks)
 - Four length bars A, B, C and D each having a basic length 125 mm, are to be calibrated using a calibrated length bar of 500 mm basic length. The 500 mm bar has an actual length of 499.9991 mm. Also it was found that $L_B = L_A + 0.0001\text{mm}$, $L_C = L_A + 0.0005\text{mm}$, $L_D = L_A - 0.0002\text{mm}$ and $L_A + L_B + L_C + L_D = L + 0.0003\text{mm}$
Determine L_A , L_B , L_C and L_D . (08 Marks)

Module-2

- Explain the mechanism of sigma comparator with a neat sketch. (08 Marks)
 - Explain the working principle of linear variable differential transformer with a neat sketch. (08 Marks)

OR

- Describe how the sine bar is used for measuring known angle and Unknown angle. (08 Marks)
 - Built up the following angles using angle gauges:
 - $13^{\circ}18'18''$
 - $54^{\circ}36'42''$ (08 Marks)

Module-3

- Explain the different types of mechanical detector – transducer elements in brief. (08 Marks)
 - Explain the working principle of linear and angular motion potentiometers with neat sketches. (08 Marks)

OR

- Describe hydraulic and magnetic signal transmission systems with neat sketches. (08 Marks)
 - Explain the principle of autocollimator with a neat sketch. (08 Marks)

Module-4

- Explain the construction and working principle of proving ring with a neat sketch. (08 Marks)
 - Explain the working principle of hydraulic dynamometer with a neat sketch. (08 Marks)

OR

- 8 a. Explain the working principle of servo recorders with a neat sketch. (08 Marks)
b. Explain the working principle of cathode ray oscilloscope with a neat sketch. (08 Marks)

Module-5

- 9 a. Write a note on:
(i) Interchangeability (ii) Selective assembly (08 Marks)
b. Explain hole basis and shaft basis system of fits with neat sketches. (08 Marks)

OR

- 10 a. Explain the working principle of McLeod gauge with a neat sketch. (08 Marks)
b. Explain the working principle of optical pyrometer with a neat sketch. (08 Marks)

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