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

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

OR

2 a. Explain the following with neat sketches :
   (i)   Imperial standard yard.
   (ii) International prototype metre. **(08 Marks)**
   b. 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 $L_B = L_A + 0.0001$ mm, $L_C = L_A + 0.0005$ mm, $L_D = L_A - 0.0002$ mm and $L_A + L_B + L_C + L_D = L + 0.0003$ mm
   Determine L_A, L_B, L_C and L_D. **(08 Marks)**

Module-2

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

OR

4 a. Describe how the sine bar is used for measuring known angle and Unknown angle. **(08 Marks)**
   b. Built up the following angles using angle gauges:
   (i) 13°18'18"   (ii) 54°36'42" **(08 Marks)**

Module-3

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

OR

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

Module-4

7 a. Explain the construction and working principle of proving ring with a neat sketch. **(08 Marks)**
   b. 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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