CBCS SCHEME

17AU35

Third Semester B.E. Degree Examination, Dec.2019/Jan.2020
Mechanical Measurements 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. Explain the three stages of Generalized Measuring Method using any one example.
                                                                                (08 Marks)
   b. Define the following terms used with reference to measurement:
      (i) Accuracy   (ii) Precision   (iii) Calibration   (iv) Sensitivity   **(08 Marks)**
   c. What is the significance of Measurement System?   **(04 Marks)**

OR

2 a. What is metrology? State any four objectives of Metrology.   **(07 Marks)**
   b. Describe with a neat sketch, International Prototype Meter.   **(07 Marks)**
   c. Discuss the Important features of wave length standards.   **(06 Marks)**

Module-2

3 a. What are the required characteristics of comparators?   **(04 Marks)**
   b. With neat sketch, describe the construction and principle of working of sigma comparator.
                                                                                (10 Marks)
   c. Explain with sketch a Dial Indicator.   **(06 Marks)**

OR

4 a. Explain with a neat sketch the construction and working principle of Solen Pneumatic Comparator.
                                                                                (07 Marks)
   b. Describe with neat sketch working of LVDT. Also write the Advantages of LVDT.
                                                                                (07 Marks)
   c. Give the systematic way of building angle gauges to set an angle of $37° 16' 42''$ using a standard set of 13 pieces. Also sketch the combination of angle gauges used.   **(06 Marks)**

Module-3

5 a. With an example explain a Primary and Secondary transducer.   **(06 Marks)**
   b. Define a transducer. State the advantages of electrical transducer over other transducer.
                                                                                (06 Marks)
   c. Illustrate the principle of Interferometry with sketches   **(08 Marks)**

OR

6 a. Write a note on Input Circuitry.   **(06 Marks)**
   b. Discuss Reflected frictional and Amplification of Backlash.   **(06 Marks)**
   c. With a sketch explain the method of measuring included angle of two adjacent faces of a component using clinometer.   **(08 Marks)**

Module-4

7 a. Explain with a sketch working of Proving Ring.   **(06 Marks)**
   b. What is dynamometer? List all the types of dynamometer.   **(06 Marks)**
   c. Explain hydraulic dynamometer with a neat sketch.   **(08 Marks)**

OR

8   a.   With a sketch explain the construction and important parts of a CRO.   (10 Marks)
    b.   What are X-Y plotters? With a block diagram explain its working.   (10 Marks)

Module-5

9   a.   Define the following terms:
         (i) Tolerance   (ii) Gauging   (04 Marks)
    b.   Explain the following showing the designation of each :
         (i) Clearance fit   (ii) Interference fit   (iii) Transition fit   (10 Marks)
    c.   Discuss hole basis and short basis system.   (06 Marks)

OR

10 a.   With a sketch explain the working and applications of Mc-Leod gauge.   (07 Marks)
    b.   What is thermocouple? State the laws of thermocouple.   (06 Marks)
    c.   Describe the construction and working of optical Pyrometer.   (07 Marks)

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