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17AU35

Third Semester B.E. Degree Examination, Jan./Feb. 2023
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. Define Metrology. List out the objectives of Metrology. **(06 Marks)**
   b. Define the following terms : i) Accuracy   ii) Sensitivity   iii) Precision   iv) Calibration   v) Hysteresis   vi) Linearity. **(06 Marks)**
   c. Describe with neat sketch : i) International Prototype Meter   ii) Imperial Standard Yard. **(08 Marks)**

OR

2 a. What are the causes of errors in measurement? Give detailed classification of errors. **(06 Marks)**
   b. Write short note on : i) Line standard   ii) End standard. **(08 Marks)**
   c. Using M112 set of slit gauges build the following dimensions :
     i) 68.208   ii) 52.496. **(06 Marks)**

Module-2

3 a. What are the required characteristics of comparators? **(04 Marks)**
   b. Explain with a neat sketch, Zeirs Ultra Optimeter. **(08 Marks)**
   c. With the help of a neat sketch, explain the working of LVDT. **(08 Marks)**

OR

4 a. With the help of a neat sketch, explain the working of Sigma comparator. **(08 Marks)**
   b. Describe the construction and working principle of Solex pneumatic gauge, with a neat sketch. **(06 Marks)**
   c. How sine centre is different from sine bar? Explain with the help of sketch. **(06 Marks)**

Module-3

5 a. Describe the various mechanical detector transducer elements in brief. **(06 Marks)**
   b. With a sketch, explain an Electro Kinetic transducer. **(06 Marks)**
   c. Explain the construction and working principle of capacitance transducer, with neat sketch. **(08 Marks)**

OR

6 a. Describe Hydraulic and magnetic transmission of signals with help of schematic diagrams. **(04 Marks)**
   b. Illustrate the principle of Interferometry with sketches. **(08 Marks)**
   c. Write a note on Auto Collimators. **(08 Marks)**

Module-4

7 a. Explain the working principle of Proxy brake dynamometer, with a neat sketch List the limitations. **(10 Marks)**
   b. Explain working principle of proving ring, with neat sketch. **(10 Marks)**

OR

8 a. With the help of a neat sketch, explain how forces is measured using analytical balance.

   (08 Marks)

  b. Explain the construction and working of Cathode ray oscilloscope, with a neat sketch.

   (06 Marks)

  c. With neat sketch, explain construction and working of X – Y plotters. (06 Marks)

Module-5

9 a. Explain the principles of Interchangeability and Selective assembly. (04 Marks)

  b. Discuss Hole basis and Shaft basis system of fibs. (08 Marks)

  c. Explain the different types of fibs with neat sketches. (08 Marks)

OR

10 a. State and explain the laws of Thermocouples. (06 Marks)

  b. Explain the measurement of pressure using Bridgeman gauge. (04 Marks)

  c. With neat sketch, explain the method of Temperature measurement by Optical pyrometers.

   (10 Marks)

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