18AU35

USN

Third Semester B.E. Degree Examination, Aug./Sept. 2020
Mechanical Measurements & Metrology

Time: 3 hrs.   Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1   a.   What is Metrology? State and explain the objectives of metrology.   **(10 Marks)**
    b.   Define the following terms used with reference to measurement:
         (i) Accuracy   (ii) Hysteresis   (iii) Repeatability   (iv) Threshold.   **(10 Marks)**

OR

2   a.   Discuss the following standards of measurements:
         (i)   Line standard   **(03 Marks)**
         (ii)   Wave length standard   **(03 Marks)**
         (iii) End standard   **(04 Marks)**
    b.   What is Error? Explain the error in measuring instruments.   **(10 Marks)**

Module-2

3   a.   What is a comparator? Give the differences between a comparators and a measuring instrument.   **(10 Marks)**
    b.   Sketch and explain the working of a sigma comparator.   **(10 Marks)**

OR

4   a.   Explain with a neat sketch, the working of a "Solex Pneumatic Comparator".   **(10 Marks)**
    b.   Select the size of angle gauges required to build. (i) 57°34'9"   (ii) 35°32'36"   **(10 Marks)**

Module-3

5   a.   Explain briefly the various types of Mechanical transducer elements.   **(10 Marks)**
    b.   With sketches, explain Piezo-Electric effect and Modes of operation of piezoelectric crystals.   **(10 Marks)**

OR

6   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-4

7   a.   Explain with a sketch working of proving ring.   **(10 Marks)**
    b.   Explain hydraulic dynamometr with a neat sketch.   **(10 Marks)**

OR

8   a.   What are the steps to be token in the preparation of the specimen and mounting of strain gauges?   **(10 Marks)**
    b.   Explain the following terms:
         (i) Force   (ii) Torque   (iii) Strain   (iv) Gauge factor   **(10 Marks)**

Module-5

9   a.   Explain the following showing the designation of each.
         (i) Clearance fit   (ii) Interfernce fit   (iii) Transition fit.   **(10 Marks)**
    b.   Define the following : (i) Nominal size   (ii) Basic size   (iii) Allowance   (iv) Fit
         (v) Tolerance   **(10 Marks)**

OR

10 a.   Describe with a neat sketch McLeod vaccum gauge.   **(10 Marks)**
    b.   What is a thermocouple? Explain the laws of thermocouple.   **(10 Marks)**

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