CBCS SCHEME

Third Semester B.E. Degree Examination, Jan./Feb. 2021
Mechanical Measurement 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. What is Metrology? State and explain the objective of Metrology. **(08 Marks)**
  b. What is the role of standard? Where are the Airy points located on 600 mm length bar. **(06 Marks)**
  c. With an example, explain the concepts of accuracy and precision in measurement system. **(06 Marks)**

OR

2 a. Describe with neat sketches,
  - (i) Imperial standard yard.
  - (ii) Wringing phenomena. **(10 Marks)**
  b. Distinguish clearly between line standard and end standard. **(06 Marks)**
  c. The slip guage set M38 consist of the following:

Range (mm)	Steps (mm)	Pieces
1.005	-	1
1.01 – 1.09	0.01	9
1.1 – 1.9	0.1	9
1.0 – 9.0	1.0	9
10.0 – 100.0	10.0	10

  List the slip guage to be wrung together to produce the following dimensions:
  - (i) 29.875 mm
  - (ii) 15.09 mm **(04 Marks)**

Module-2

3 a. What is comparator? Give a list of various types of comparator. With a neat sketch describe the working principle of sigma comparator. **(10 Marks)**
  b. Describe with a neat sketch, construction and working of LVDT. **(10 Marks)**

OR

4 a. Explain the working principle of SINE bar and highlights its applications. **(08 Marks)**
  b. Explain the sources of errors in sine bars. **(06 Marks)**
  c. Select the sizes of angle gauges required to build,
  - (i) $102°8'42''$
  - (ii) $37°9'18''$ **(06 Marks)**

Module-3

5 a. What are intermediate modifying devices? List out some of the problems inherent in any mechanical intermediate modifying system and explain in brief any two inherent problems. **(10 Marks)**
  b. With a block diagram, explain a telemetering transmitting system and mention its advantages and disadvantages of system. **(10 Marks)**

OR

6 a. Write a short note on:
  - (i) Vaccum tube amplifier.
  - (ii) Electronic amplifier. **(10 Marks)**
  b. What are X-Y plotter? With a block diagram, explain X-Y working principles. **(10 Marks)**

Module-4

7 a. What are the methods of force measurement? With a neat sketch explain the analytical balance. **(10 Marks)**

  b. With the help of a neat sketch, explain the working principles of prony brake dynamometer. **(10 Marks)**

OR

8 a. Write a short note on:
     (i)   Mounting of strain gauge.
     (ii) Strain measurement. **(10 Marks)**

  b. Discuss the problems associated with strain gauge installations. **(10 Marks)**

Module-5

9 a. What are the various types of fits used for the assembly of machine parts? **(04 Marks)**

  b. Differentiate between hole basis system and shaft basis system with sketches. **(08 Marks)**

  c. Discuss in brief, what are the different types of materials used for making gauges? **(08 Marks)**

OR

10 a. With a neat sketch, explain pirani thermal conductivity gauge. **(10 Marks)**

  b. Write a short note on use of elastic members in pressure measuring devices. **(10 Marks)**

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