CBCS SCHEME

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18AU35

Third Semester B.E. Degree Examination, July/August 2022
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. With a block diagram, explain generalized measurement system. **(10 Marks)**

b. Define the following terms related to measurements:
(i) Accuracy (ii) Precision (iii) Sensitivity
(iv) Calibration (v) Hysteresis **(10 Marks)**

OR

2 a. With a neat sketch, explain material length standards. **(10 Marks)**

b. Explain the wavelength standard of measurements. **(05 Marks)**

c. What are the causes of errors in measurement? **(05 Marks)**

Module-2

3 a. With a neat sketch, explain the working principle of a sigma computer. **(10 Marks)**

b. With a neat sketch elaborate the working principle of Zeiss ultraoptimeter. **(10 Marks)**

OR

4 a. With a neat sketch explain the working principle of a sine bar and mention its limitations. **(10 Marks)**

b. With a neat sketch, explain the working principle of an autocollimator. **(10 Marks)**

Module-3

5 a. With the help of neat sketches, explain any two types of mechanical transducers. **(10 Marks)**

b. With a neat sketch elaborate the working principle of a capacitive transducers. **(10 Marks)**

OR

6 a. Elaborate the working principle of a cathode ray oscilloscope. **(10 Marks)**

b. With a neat sketch, describe the working principle of x-y plotters. **(10 Marks)**

Module-4

7 a. With a neat sketch, explain the working principle of a platform balance. **(10 Marks)**

b. What is a proving ring? With a neat sketch, explain the working principle of a proving ring. **(10 Marks)**

OR

8 a. Elaborate the working principle of prony brake dynamometer and mention its limitations. **(10 Marks)**

b. With a neat sketch, explain the working principle of a eddy current dynamometer. **(10 Marks)**

Module-5

9 a. Explain the concept of interchangeability and selective assembly. **(06 Marks)**

b. With a neat sketch, explain unilateral and bilateral tolerance. **(04 Marks)**

c. With sketches, explain "Hole-basis" and "Shaft-basis" system of fit. Explain why hole-basis system is preferred over shaft basis systems. **(10 Marks)**

OR

10 a. Elaborate with a neat sketch the working principle of a McLeod gauge. **(10 Marks)**

b. With a neat sketch, explain the working principle of a pirani thermal conductivity gauge. **(10 Marks)**

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