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18ME36B/18MEB306

Third Semester B.E. Degree Examination, Aug./Sept.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. Describe with a neat sketch, the constructional features of an "International Proto type Meter". **(07 Marks)**

b. Distinguish between line and end standards. **(05 Marks)**

c. Discuss the procedure for calibration of End Bars. **(08 Marks)**

OR

2 a. Build up a length of 35.4875 using M_{112} set use two protector slips of 2.5mm each. **(06 Marks)**

b. With a neat sketch, explain the working of sine bar and mention its limitations. **(07 Marks)**

c. With a neat sketch, explain the working of autocollimator. **(07 Marks)**

Module-2

3 a. Define the terms:
i) Limits ii) Tolerance iii) Allowance. **(06 Marks)**

b. With neat sketches explain different types of fit. **(07 Marks)**

c. Discuss 'hole based' and 'shaft based' system of fits which is preferred why. **(07 Marks)**

OR

4 a. Define comparator. What is need of a comparator? **(05 Marks)**

b. With neat sketch and explain working of Sigma comparator. **(07 Marks)**

c. Sketch and explain working of LVDT. **(08 Marks)**

Module-3

5 a. Define: i) Pitch ii) Lead iii) Crest of the thread. **(06 Marks)**

b. Derive an expression for best wire size for screw thread measurement. **(07 Marks)**

c. With neat sketch explain the working of tools maker's microscope. **(07 Marks)**

OR

6 a. With a neat sketch explain gear teeth terminology. **(06 Marks)**

b. What is Runout and involute profile in gear system? **(06 Marks)**

c. Sketch and explain Parkinson's gear tester. **(08 Marks)**

Module-4

7 a. Define: i) Accuracy ii) Precision iii) Loading effect iv) Calibration v) Error vi) Repeatability. **(06 Marks)**

b. Explain the working of generalized measurement system with block diagram taking one of the example. **(08 Marks)**

c. What is the significance of measurement system? **(06 Marks)**

OR

8 a. What is transducer? Sketch and explain principle of electronic transducer. What are the advantages of electronic transducer? **(08 Marks)**

b. With a circuit diagram, explain Ballast circuit. **(06 Marks)**

c. With a neat sketch, explain stylus type oscillography. **(06 Marks)**

Module-5

9 a. Explain measurement of force using system unequal arm balance. **(06 Marks)**

b. With a neat sketch, explain working of Prony brake dyanamometer. **(07 Marks)**

c. With a neat sketch, explain McLeod gauge. **(07 Marks)**

OR

10 a. What is thermocouple? Give the laws of thermocouple. **(06 Marks)**

b. With a neat sketch, explain the working principle of optical pyrometer. **(08 Marks)**

c. Define strain gauge. With a neat sketch explain WheatStone bridge circuit. **(06 Marks)**

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