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18AU35

Third Semester B.E. Degree Examination, July/August 2021 Mechanical Measurement and Metrology

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. With block diagram, explain the different stages of the generalized measurement system with suitable example. (14 Marks)
b. Define Measurement. State its significance. (06 Marks)
- 2 a. State the objectives of Metrology. (08 Marks)
b. Define Line standard. (02 Marks)
c. With neat sketch, explain the material standard "International Prototype Meter". (10 Marks)
- 3 a. Mention the basic features of a Comparator. (03 Marks)
b. With a neat sketch, explain the construction and working of Zeiss – Ultra Optimeter. (11 Marks)
c. State the limitations of a Mechanical Comparator. (06 Marks)
- 4 a. With neat diagram, explain the Working of a Sine - Centre. (10 Marks)
b. Explain the working principle of a Sine bar. (10 Marks)
- 5 a. State the advantages of Electrical transducers. (04 Marks)
b. With an example, explain primary and secondary transducers. (08 Marks)
c. Explain the various types of elastic members used in pressure sensing. (08 Marks)
- 6 a. With a sketch, explain the construction and important parts of a CRO. (10 Marks)
b. Explain the temperature problems of intermediate modifying devices. (10 Marks)
- 7 a. With a neat sketch, explain an unequal arm balance. (10 Marks)
b. With neat diagram, explain how mechanical dynameter can be used to measure torque. (10 Marks)
- 8 a. State the steps followed for proper preparation and mounting of strain gauges. (06 Marks)
b. Briefly explain the problems associated with strain gauge installations. (06 Marks)
c. With sketch, explain wire type and foil type resistance strain gauges. (08 Marks)
- 9 a. Explain the meaning of "Interchangeability" and "Selective Assembly". (10 Marks)
b. With sketches, explain "Hole – basis" and "Shaft – basis" system of fit. Explain why hole basis system is preferred over shaft basis systems. (10 Marks)
- 10 a. With sketch, explain the working of a low pressure measuring instrument. (10 Marks)
b. With sketch, explain how an optical pyrometer is used for measuring temperature. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.