

CBCS SCHEME

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15MT46

Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Instrumentation and Measurement

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain the analog and digital modes of operation of instruments. Also explain how the resolution of digital instruments can be increased. (08 Marks)
b. Explain how the effect of modifying and interfering inputs is minimized or eliminated in measurement systems with examples. (08 Marks)

OR

- 2 a. i) Explain primary and secondary transducers with example. (04 Marks)
ii) List the factors to be considered while selecting transducer. (04 Marks)
b. Describe the differences between deflection and null type of instruments giving suitable example. Discuss about their accuracy. (08 Marks)

Module-2

- 3 a. Define : i) Accuracy ii) Precision iii) Resolution
iv) Sensitivity v) Linearity vi) Error. (08 Marks)
b. explain the phenomenon of hysteresis in measurement systems and also explain the terms threshold, dead zone and dead time. (08 Marks)

OR

- 4 a. Derive an expression for time response of a 2nd order damped system when subjected to a unit ramp input and sketch the response. (08 Marks)
b. Define the following terms :
i) Static error ii) Scale range iii) Static correction iv) Signal to noise ratio. (08 Marks)

Module-3

- 5 a. Explain variable capacitance transducer devices with example. (08 Marks)
b. Explain Hall effect devices with principle. Derive expression for hall field and hall velocity. (08 Marks)

OR

- 6 a. Explain differential pressure level measurement with diagram. (08 Marks)
b. Explain thermal level sensor and optical level sensor. (08 Marks)

Module-4

- 7 a. Explain with a diagram the operation of a semiconductor strain gauge and also state its advantages and disadvantages. (08 Marks)
b. Briefly explain the factors affecting strain measurements. (08 Marks)

OR

- 8 a. Explain with a diagram the working of a Wagner's ground connection. (08 Marks)
b. Describe the diagram the operation of Kelvin's bridge. (08 Marks)

Module-5

- 9 a. Define gauge factor and derive the expression for it. (08 Marks)
b. Explain construction, principle and working of LVDT. (08 Marks)

OR

- 10 a. Explain the working of piezo electric transducer with circuit diagram. (08 Marks)
b. Draw the structure of an LED and explain its operation. (08 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.