



CBCS SCHEME

17MT46

Fourth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Instrumentation and Measurements

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. With neat block diagram, explain the elements of generalized measurement system. (10 Marks)
- b. Explain the functions of Instrument and Measurement systems. (06 Marks)
- c. Differentiate between Null and Deflection type instruments. (04 Marks)

OR

- 2 a. Explain the different methods of correction for interfering and modifying inputs with example. (10 Marks)
- b. With neat diagram, explain the input output configuration of measuring instruments and measurement systems. (04 Marks)
- c. Define transducer and give classification with example. (06 Marks)

Module-2

- 3 a. Explain the following static characteristics, instrument and measurement system:
(i) Accuracy (ii) Precision (iii) Drift (iv) SNR (v) Dead time and zone (10 Marks)
- b. With neat sketches, explain the different types of standard input signal to study the response of the systems. (10 Marks)

OR

- 4 a. Derive the expression for the response of a second order system to a step input under different damping conditions. (10 Marks)
- b. Explain the time domain specifications of a second order system to a step input. (06 Marks)
- c. Explain the frequency domain analysis of first order system. (04 Marks)

Module-3

- 5 a. Explain the variable capacitance transducer with necessary diagrams. (10 Marks)
- b. Explain Hall Effect devices and proximity devices. (10 Marks)

OR

- 6 a. Explain the differential pressure level detector. (10 Marks)
- b. With neat diagrams, explain optical level switches and ultrasonic level detector. (10 Marks)

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 e.g. 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Explain the different types of electrical strain gauges. (10 Marks)
b. Explain the measurement of strain using Wheatstone bridge circuit. (10 Marks)

OR

- 8 a. With neat diagram, explain working of Wheatstone bridge and derive the balanced condition. (06 Marks)
b. Explain the principle of operation of Wien's bridge and derive the conditions for balancing. (10 Marks)
c. Write notes on Wagner ground connection. (04 Marks)

Module-5

- 9 a. Explain resistive position transducer and resistance thermometer. (10 Marks)
b. Explain the linear variable differential transducer. (10 Marks)

OR

- 10 a. Explain the working principle of thermo couple with neat diagram. (06 Marks)
b. Explain piezoelectric pressure transducer. (04 Marks)
c. Explain the construction and working principle of LED. (10 Marks)
