CBCS SCHEME

USN | | | | | | | | | |

17MT46

Fourth Semester B.E. Degree Examination, Aug./Sept.2020
Instrumentation and Measurement

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Explain the analog and digital nodes of operation of instruments. Also explain how the resolution of digital instruments can be increased. **(10 Marks)**

b. Explain how the effect of modifying and interfering inputs is minimized or eliminated in measurement system with examples. **(10 Marks)**

OR

2 a. Describe the differences between deflection and null type of instruments giving suitable example. Discuss about their accuracy. **(10 Marks)**

b. Explain primary and secondary transducers with example. List the factors to be considered while selecting a transducer. **(10 Marks)**

Module-2

3 a. Explain the phenomenon of hysteresis in measurement systems and also explain the terms threshold , dead zone and dead time. **(10 Marks)**

b. Define i) Accuracy ii) Precision iii) Resolution iv) Sensitivity v) Error. **(10 Marks)**

OR

4 a. Derive an expression for time response of a 2^{nd} order damped system when subjected to a unit ramp input and sketch the response. **(10 Marks)**

b. Define the following terms : i) Static error ii) Scale range iii) Scale span iv) Signal to noise ratio v) Reproducibility and drift. **(10 Marks)**

Module-3

5 a. Explain variable capacitance transducer devices with example. **(10 Marks)**

b. Explain hall effect devices with principle. Derive expression for hall field and hall velocity. **(10 Marks)**

OR

6 a. Explain Thermal level sensor and Optical level sensor. **(10 Marks)**

b. Explain differential pressure level measurement with diagram. **(10 Marks)**

Module-4

7 a. Describe with the diagram the operation of Kelvin's bridge. **(10 Marks)**

b. Explain with a diagram , the working of a Wagner's ground connection. **(10 Marks)**

OR

8 a. Explain the working of Wien's bridge. Derive the balanced equation for it. **(10 Marks)**

b. Explain with the diagram the operation of a semiconductor strain guage, also state its advantages and disadvantages. **(10 Marks)**

Module-5

9 a. Explain the working of piezo electric transducer with a circuit diagram. **(10 Marks)**
b. Explain the working principle of thermocouple. **(10 Marks)**

OR

10 a. Describe with the diagram, construction of an LVDT. **(10 Marks)**
b. Write a short notes on :
i) Resistant Temperature Detector (RTD).
ii) Resistance Position Transducer. **(10 Marks)**

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