CBCS SCHEME

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

Time: 3 hrs.   Max. Marks: 80

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 systems. **(08 Marks)**
   b. Explain the functions of instruments and measurement systems. **(04 Marks)**
   c. Distinguish between deflection and null type instruments. **(04 Marks)**

OR

2 a. Explain the methods of correction for interfering and modifying inputs. **(10 Marks)**
   b. Explain the classification of transducer in detail. **(06 Marks)**

Module-2

3 Write a short notes on the following:
   i)   Accuracy and precision
   ii)   Drift and reproducibility
   iii) Scale range and scale span
   iv)   Repeatability and SNR
   v)   Sensitivity and linearity
   vi)   Hysteresis and threshold
   vii) Dead zone and dead time
   viii) Resolution. **(16 Marks)**

OR

4 a. Derive the expression for response of a second order system to step input. **(08 Marks)**
   b. Explain the time domain specifications of a second order system. **(04 Marks)**
   c. Derive the expression for frequency response of first order system. **(04 Marks)**

Module-3

5 a. With neat diagrams, explain the variable capacitance transducer. **(08 Marks)**
   b. Explain the operation of hall effect devices in detail. **(08 Marks)**

OR

6 a. Explain the differential pressure level detector with neat diagrams. **(08 Marks)**
   b. Explain different types of float level devices. **(04 Marks)**
   c. Explain about radiation level sensor. **(04 Marks)**

Module-4

7 a. Explain different types of electrical strain gauges. **(08 Marks)**
   b. Explain measurement of strain using Wheatstone bridge circuit. **(08 Marks)**

OR

8   a.   For a Wheatstone bridge circuit $R_1 = 10\Omega$, $R_2 = 20\Omega$ and $R_x = 30\Omega$. What value should R_3 be adjusted so as to achieve a balanced condition. If $V_o = 6v$, $R_a = 0.1\Omega$, R_x deviated $R_x = 30.01\Omega$ Calculate reading of ammeter. **(05 Marks)**

   b.   With neat circuit diagram explain Wein bride operation and derive the expression for frequency. **(07 Marks)**

   c.   Write short notes on Wagner's earth connection. **(04 Marks)**

Module-5

9   a.   With neat diagrams, explain the resistive position transducer. **(06 Marks)**

   b.   Explain the operation of linear variable differential transducer. **(10 Marks)**

OR

10   a.   Explain the operation of piezo electric pressure transducer. **(06 Marks)**

   b.   Explain the seebek, peltier and Thomson effect also the operation of thermocouple. **(05 Marks)**

   c.   Explain the different types of LCD displays. **(05 Marks)**

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