## CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐

## Third Semester B.E. Degree Examination, Aug./Sept.2020
## Electronic Instrumentation

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

1  a. Explain with suitable example accuracy and precision. **(05 Marks)**
   b. What is loading effect? A simple circuit of $R_1 = 20\ \Omega$ and $R_2 = 25\ \Omega$ connected to a 250 V dc source. If the voltage across $R_2$ is to be measured by the voltmeter having
   (i) A sensitivity of 500 $\Omega$/V
   (ii) A sensitivity of 10,000 $\Omega$V
   Find which voltmeter will read more accurately. Both the meters are used on the 150 V range. **(10 Marks)**
   c. Explain multirange voltmeter with a neat diagram. **(05 Marks)**

### OR

2  a. List and explain the types of measurement errors. **(06 Marks)**
   b. The meter A has a range of 0-100V and multiplier resistance of 25 K$\Omega$. The meter B has a range 0-1000 V and a multiplier resistance of 150 K$\Omega$. Both meters have basic meter resistance of 1 K$\Omega$. Find which meter is more sensitive. **(04 Marks)**
   c. What is a thermocouple? Explain the different types of thermocouple and what are the limitations of thermocouple. **(10 Marks)**

### Module-2

3  a. Explain the working of linear ramp type DVM. **(10 Marks)**
   b. Explain with a diagram, the working of digital PH meter. **(10 Marks)**

### OR

4  a. With the help of neat diagram, explain the working of successive approximation type DVM. **(10 Marks)**
   b. With the help of a diagram, explain the operation of universal counter timer. **(10 Marks)**

### Module-3

5  a. With a neat block diagram, explain the general purpose of CRO. **(08 Marks)**
   b. Explain in detail the working of square and pulse generator. **(06 Marks)**
   c. Explain working of sweep frequency generator. **(06 Marks)**

### OR

6  a. Explain in detail the working of digital storage oscilloscope and list the advantages of DSO. **(10 Marks)**
   b. Explain general pulse characteristics. **(04 Marks)**
   c. Explain in detail the working of function generator. **(06 Marks)**

## Module-4

7  a.  Explain in detail the working of Wien bridge oscillator and find the parallel R and C that causes a Wien bridge to null with the following components values:
$R_1 = 2.7\ K\Omega$, $R_2 = 22\ K\Omega$, $C_1 = 5\ \mu F$, $R_4 = 100\ K\Omega$ and the operating frequency is 2.2 kHz.
(08 Marks)

   b.  Explain and derive the balance equation of wheat stone bridge and mention the limitation.
(04 Marks)

   c.  What is Meggar? Explain basic Meggar circuit.  (08 Marks)

## OR

8  a.  Explain and derive expression for Maxwell's bridge. If bridge constants are $C_1 = 0.5\ \mu F$, $R_1 = 1200\ \Omega$, $R_2 = 700\Omega$, $R_3 = 300\ \Omega$. Find the resistance and inductance of coil.  (08 Marks)

   b.  Explain Wagner's earth connection.  (06 Marks)

   c.  Explain with a diagram the operation of stroboscope.  (06 Marks)

## Module-5

9  a.  List the factors to be considered while selecting transducers.  (05 Marks)

   b.  Derive expression for the gauge factor $K = 1 + 2\mu$ and explain the bonded resistance wire strain gauges with a neat diagram.  (10 Marks)

   c.  What is transistor? Explain different form of thermistor.  (05 Marks)

## OR

10  a.  List the advantages of LVDT.  (04 Marks)

    b.  Explain the construction, principle and operation of LVDT.  (08 Marks)

    c.  Explain with a diagram the operation of resistive pressure transducer.  (08 Marks)

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