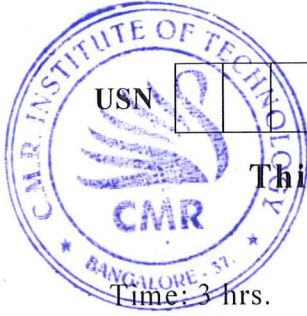


# CBCS SCHEME



17EC32

## Third Semester B.E. Degree Examination, June/July 2019 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. Define the following terms as applied to an electronic instruments:
- Accuracy
  - Precision
  - Error
  - Resolution
  - Sensitivity
- (10 Marks)
- b. A basic D'Arsonval movement with an internal resistance of  $50\Omega$  and a full scale deflection current of 2 mA is to be used as a multirange voltmeter. Determine the series resistances to obtain the voltage ranges of 0-10V, 0-50V, 0-100V and 0-500V. (10 Marks)

OR

- 2 a. Explain the working of a true RMS voltmeter with a suitable diagram. (10 Marks)
- b. Explain the various types of thermocouple used in RF ammeter in detail. (10 Marks)

### Module-2

- 3 a. Explain the working of dual slope type DVM with a block diagram. (10 Marks)
- b. With a neat block diagram, explain the working of frequency meter. (10 Marks)

OR

- 4 a. Draw the block diagram and explain the working principle of successive approximation type DVM. (10 Marks)
- b. Explain the working of digital pH meter with the help of block diagram. (10 Marks)

### Module-3

- 5 a. Draw the block diagram of CRO and explain the functions of each block. (10 Marks)
- b. Explain with a block diagram AF sine-square wave generator. (10 Marks)

OR

- 6 a. Explain with a block diagram of function generator in detail. (10 Marks)
- b. Explain the operation of digital storage oscilloscope with a help of block diagram. (10 Marks)

### Module-4

- 7 a. Explain with a help of a neat diagram, construction and principle of operation of Megger. (10 Marks)
- b. Draw the Maxwell's bridge to determine inductance in terms of known capacitance and derive Q-factor and expression for inductance. (10 Marks)

OR

- 8 a. Find parallel R and C, that causes a Wien's bridge to null with the following components values.  $R_1 = 2.7 \text{ K}\Omega$ ,  $R_2 = 22 \text{ K}\Omega$ ,  $C_1 = 5 \text{ }\mu\text{F}$ ,  $R_4 = 100 \text{ K}\Omega$  and operating frequency is 2.2 kHz. (10 Marks)
- b. Explain susceptance method of Q-measurement. (06 Marks)
- c. The self capacitance of a coil is to be measured by Q-meter. The first measurement result is  $f_1 = 1.5 \text{ MHz}$  and  $C_1 = 550 \text{ PF}$ . The second measurement result is  $f_2 = 3 \text{ MHz}$  and a new value of tuning capacitor is 110 pF. Find the distributed capacitance and inductance. (04 Marks)

**Module-5**

- 9 a. What is transducer? Explain working of resistive position transducer with a neat sketch. (10 Marks)
- b. What are the different types of photoelectric transducer? Explain photo voltaic transducer. (10 Marks)

OR

- 10 a. With a neat sketch, explain construction and working of LVDT. (10 Marks)
- b. What is gauge factor? Derive an expression for gauge factor and prove that  $K = 1 + 2\mu$ . (10 Marks)

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