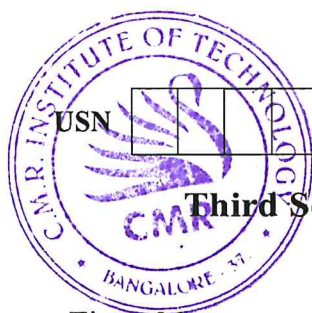


CBCS SCHEME



17EC32

Third Semester B.E. Degree Examination, July/August 2022 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 the following terms briefly :
 - i) Accuracy
 - ii) Precision
 - iii) Resolution and significant figures
 - iv) Gross errors. (10 Marks)
- b. What is thermocouple? Explain different types of thermocouple. (10 Marks)

OR

- 2 a. Explain multirange voltmeter With a neat diagram. (05 Marks)
- b. Convert a basic 'D' Arsonval movement with internal resistance of 50Ω and full scale deflection current of 2mA into a multirange DC voltmeter with voltage range of $0 - 10\text{V}$, $0 - 50\text{V}$, $0 - 250\text{V}$ connect the multiplier resistance in series with 'D' Arsonval movement. [Fig.Q2(b)].

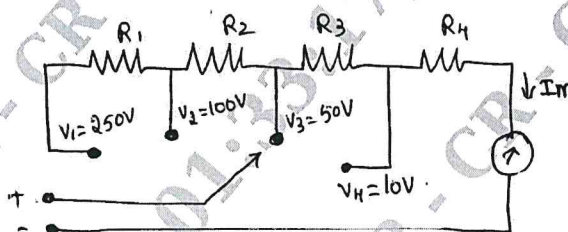


Fig.Q2(b) (10 Marks)

- c. Calculate the values of multiplier resistance on the 50V range of a DC voltmeter, that uses a $200\mu\text{A}$, meter measurement with an internal resistance of 100Ω . (05 Marks)

Module-2

- 3 a. Explain the operation of the ramp type digital voltmeter with voltage to time conversion waveform and block diagram. (10 Marks)
- b. With the help of neat diagram, explain the working of successive approximation type DVM. (10 Marks)

OR

- 4 a. Explain the working of digital tachometer and digital pH meter. (10 Marks)
- b. What is the principle used in measuring frequency of a signal digital technique, with diagram. Explain the operation of a digital frequency meter. (10 Marks)

Module-3

- 5 a. Draw the block diagram of CRO and explain the functions of each block. (10 Marks)
- b. Draw the block diagram of CRT and explain the function of each block with CRT features. (10 Marks)

OR

- 6 a. Explain the operation of an AF sine and square wave generator with the help of a block diagram. (10 Marks)
- b. Explain in detail the working of digital storage oscilloscope and list the advantages of digital storage oscilloscope. (10 Marks)

Module-4

- 7 a. Sketch and explain the operation of a phase sensitive detector to compare the phase of a signal with a reference signal. (10 Marks)
- b. Derive the balance equation for Wheatstone's bridge and mention its advantages and limitations. (10 Marks)

OR

CMRIT LIBRARY
BANGALORE - 560 037

- 8 a. Find parallel R and C that causes a Wein's bridge to null with the following components values $R_1 = 2.7K\Omega$, $R_2 = 22K\Omega$, $C_1 = 5\mu F$, $R_4 = 100K\Omega$ and operating frequency is 2.2KHz. (10 Marks)
- b. Draw the Maxwell's bridge to determine inductance in terms of known capacitance and derive Q – factor and expression inductance. (10 Marks)

Module-5

- 9 a. Explain the operation of resistive position transducer with block diagram. (10 Marks)
- b. What is gauge factor? Derive an expression for gauge factor and prove that $K = 1 + 2\mu$. (10 Marks)

OR

- 10 a. Explain the construction, principle and operation of LVDT. (10 Marks)
- b. What are the different types of photoelectric transducer? Explain. (10 Marks)
