

CBCS SCHEME



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17EC32

Third Semester B.E. Degree Examination, June/July 2023 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:
 - i) Accuracy and precision
 - ii) Resolution and significant figures
 - iii) Absolute and relative errors. (08 Marks)
- b. Mention and explain different types of thermocouples used for RF current measurements. (08 Marks)
- c. The expected value of the voltage across a resistor is 80V. However the measurement yields a value of 79V. Calculate:
 - i) Absolute Error
 - ii) % Error
 - iii) Relative Accuracy
 - iv) % of Accuracy. (04 Marks)

OR

- 2 a. Calculate series connected multiplier resistance with a D'Arsonval movement with an internal resistance of 50Ω and I_{fsd} of 2mA into a multirange d.c voltmeter with a range from 0-10V, 0-50V, 0-100V and 0-250V. (08 Marks)
- b. With neat block diagram, explain the working of true RMS voltmeter. (06 Marks)
- c. Explain the operation of a multirange Ammeter and a shunt with suitable diagrams. (06 Marks)

Module-2

- 3 a. Explain the operation of Dual slope integrating type DVM. (10 Marks)
- b. With example describe the operation of a successive approximation type DVM. (10 Marks)

OR

- 4 a. Explain with necessary diagrams, the working of digital multimeter. (10 Marks)
- b. Explain the working of the following:
 - i) Digital pH meter
 - ii) Digital phase meter. (10 Marks)

Module-3

- 5 a. Draw the block diagram of an oscilloscope and explain functions of each block. (10 Marks)
- b. With block diagram, explain working of a digital storage oscilloscope. (10 Marks)

OR

- 6 a. Explain the operation of function generator. (10 Marks)
- b. Describe the operation of modern laboratory signal generator and discuss how to improve stability. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. $42+8=50$, will be treated as malpractice.

Module-4

- 7 a. What is Q-meter? Explain the working of Q-meter to measure Q and inductance of a coil using suitable diagram. (10 Marks)
- b. With neat diagram, explain the operation of megger meter. List advantages and disadvantages of using megger meter for measurement. (10 Marks)

OR

- 8 a. Find the equivalent series resistance and inductance that causes a bridge to null with the following component values $R_1 = 1200\Omega$, $R_2 = 700\Omega$, $R_3 = 300\Omega$ and $C_1 = 0.5\mu\text{F}$ by deriving the appropriate bridge balance equations. (10 Marks)
- b. Derive the unbalanced wheatstone bridge equations and find the current through galvanometer for the parameters. $R_1 = 1\text{K}\Omega$, $R_2 = 2.5\text{K}\Omega$, $R_3 = 3.5\text{K}\Omega$, $R_4 = 300\Omega$ and $V = 6\text{V}$. (10 Marks)

Module-5

- 9 a. List the factors to be considered while selecting the transducers. (10 Marks)
- b. Explain the working of piezoelectric transducer. (10 Marks)

OR

- 10 a. Explain the construction and operation of LVDT with suitable figures. (10 Marks)
- b. Explain semiconductor photo diode and photo transistor. (10 Marks)
