

2021

B.E. (Electronics and Communication Engineering)

Third Semester

EC-306: Electronic Measurement and Instrumentation

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

- A 0-25 A ammeter has guaranteed accuracy of 1 percent of full scale reading. The current measured by this instrument is 10A. Determine the limiting error in percentage.
- What is meant by the deflection factor and deflection sensitivity of a CRO?
- What is the difference between a photovoltaic and a photoconductive transducer?
- Calculate and comment on the resolution of 6bit and 12bit DAC.
- What are different elements of data acquisition and control system? (5x2)

UNIT - I

- Give the analysis of a shunt type ohmmeter. In a shunt type ohmmeter, a basic meter with $I_{fsd} = 2\text{mA}$ and internal resistance of 25Ω , is used. The battery is of 1.5V. Find value of series adjustable resistance. At what point (in percentage of full scale) will 100Ω be marked on the scale. (10)
- Determine the principle of working and application of Double Kelvin Bridge. Derive the condition for balance. The four arms of a Wheatstone bridge are $AB=100\Omega$, $BC=1000\Omega$, $CD=4000\Omega$, $DA=400\Omega$. The galvanometer has resistance of 100Ω and sensitivity of $100\text{mm}/\mu\text{A}$ and is connected across AC, A source of 4V is connected across BD, Calculate the current through galvanometer and its deflection if resistance of arm DA changes from 400Ω to 401Ω . (10)
- Draw a Lissajous pattern for equal frequency, equal voltage and 90 degree phase shift. With help of block diagram explain the various working modes of Dual trace CRO. How it is different from a dual beam CRO. (10)

P.T.O.

(2)

UNIT – II

- V. Compare the characteristics of various types of transducers based on variation of Resistance. Derive the expression of gauge factor. A resistance displacement transducer with shaft stroke of 25mm is applied to the circuit shown. What displacement is indicated for 3V, 5V and 8V? (10)
- VI. Compare virtual instrument with the traditional instrument. Is VI uses the data flow programming? Justify. Create a VI which converts a decimal number to a binary number using for loop. (10)
- VII. Discuss working and applications of differential instrumentation amplifier? Differentiate analog DAS and digital DAS. Discuss the principle of operation of LVDT. (10)

x-x-x