

1059

B.E. (Electronics and Communication Engineering)  
Sixth Semester

EC-612: Electronic Measurements 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) Differentiate the error and uncertainty.
- b) Using concept of loading effect prove that the error can be reduced to about 1% if the input admittance of ammeter is at least 100 times the output admittance of the source.
- c) Name a bridge which can measure low resistance. Discuss its principal.
- d) Define the delayed sweep technique of CRO
- e) A resistance wire strain gauge uses a soft iron wire of small diameter. The gauge factor is +42. Calculate the Poisson's ratio.
- f) Derive the equation of balance of a bridge.
- g) Draw the pattern displayed when two Sine wave input signals of equal frequency and amplitude are applied to the CRO in x-y mode.
- h) Is VI a data flow programming? Justify.
- i) Differentiate with example the active and the passive transducers.
- j) Whether LEDs are made of direct or indirect band gap materials? (10x1)

UNIT - I

- II. a) Discuss the principle of working and derive the expression for deflection of a Moving Iron type Instrument. How these can be used for AC measurement?
- b) Draw the circuit diagram and obtain the balance bridge condition for Wheatstone bridge. What are its applications? (5,5)
- III. a) Derive expression of beam deflection depends in a CRO. Explain the detailed Block diagram of a dual-trace CRO.
- b) Discuss the working of Spectrum Analyzer. Compare it with CRO and Logic analyzer. (5,5)

P.T.O.

(2)

- IV. a) Design a multi-range ammeter with range of 0-1 A, .5A and 10A employing individual shunts with Galvanometer with internal resistance  $500\Omega$  and full scale deflection of 10mA.
- b) What are various types of error in measurements? How these can be minimized?  
(2x5)

UNIT - II

- V. a) What are various types of Inductive Transducers? Discuss their working principle and applications.
- b) Discuss the operation of Strain Gauge. Derive expression for Gauge factor. Illustrate its applications. (2x5)
- VI. a) Discuss the working principal of Successive Approximation type ADC. Which ADC is most commonly used in Digital Multimeter and why?
- b) What is a logarithmic amplifier? What are the advantages of Instrumentation amplifier? (2x5)
- VII. a) What are various data types defined in VI? Design a VI to find whether the given number is prime or not.
- b) What is polymorphism in Lab VIEW? Differentiate between an array and a cluster with an example. (2x5)

x-x-x