

**R16**

Code No: 137CF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, January/February - 2023

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(Electronics and Communication Engineering)

Time: 3 Hours

Max. Marks: 75

Note: i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART – A**

**(25 Marks)**

- 1.a) Define Accuracy and Resolution. [2]
- b) What are different types of error in measuring instruments? [3]
- c) What is Harmonic Distortion? [2]
- d) State the applications of pulse and square wave generators. [3]
- e) What are the two modes of operation in dual trace oscilloscope? [2]
- f) How frequency can be measured using Lissajous figures. [3]
- g) What are applications of Hotwire Anemometers? [2]
- h) Give the applications, advantages of Thermocouples. [3]
- i) What is meant by balancing a bridge? [2]
- j) Write about pressure sensors. [3]

**PART – B**

**(50 Marks)**

- 2.a) Explain the working of a basic DC voltmeter. How can its range be extended?
- b) Calculate the value of multiplier resistance on the 50V range of a dc voltmeter that uses a 200 $\mu$ A meter movement with an internal resistance of 100  $\Omega$ . [5+5]

**OR**

3. Write notes on the following:

- a) Series type Ohmmeters.
- b) Shunt type Ohmmeters. [5+5]

- 4.a) Explain the sweep frequency generator with neat block diagram.
- b) Differentiate wave analyzer and harmonic distortion analyzer. [6+4]

**OR**

- 5.a) Discuss pulse generator with neat block diagrams.
- b) Explain operation of Video Signal Generator. [5+5]

- 6.a) What are active probes used with CRO? Draw the circuit of a FET probe and explain.
- b) Explain the working of Digital Storage Oscilloscope. [5+5]

**OR**

- 7.a) How to measure time, period and frequency using oscilloscope?
- b) Explain the working of Dual Trace Oscilloscope. [5+5]

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- 8.a) Draw the diagram of strain gauge and explain the principle of measurement.  
b) Draw the various kinds of thermometers and explain the principle of operation. [5+5]

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- 9.a) Explain the working principle of Piezo electric transducer in detail. **OR**  
b) Discuss briefly the working of LVDT. [5+5]

- 10.a) Explain the measurement of Inductance using Maxwell's bridge.  
b) A Maxwell bridge is used to measure an inductive impedance. The bridge constants at balance are  $C_1 = 0.01 \mu\text{F}$ ,  $R_1 = 470 \text{ K}\Omega$ ,  $R_2 = 5.1 \text{ K}\Omega$  and  $R_3 = 100 \Omega$ . Find the series equivalent of the unknown impedance. [5+5]

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- 11.a) With neat sketch, explain the measurements of liquid level.  
b) With neat sketch, explain the measurements of humidity and moisture. [5+5]

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