

R15

Code No: 125AM

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III 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) What are the types of errors in measuring instruments? [2]
- b) Enumerate the static characteristics of an instruments. [3]
- c) Mention the various types of signal analyzer. [2]
- d) Briefly explain principle of working of frequency synthesizer. [3]
- e) What is the purpose of time base generator in CRO? [2]
- f) What are the types of CRO Probes? [3]
- g) State the properties of piezoelectric transducers. [2]
- h) Explain the basic principle used in syncros. [3]
- i) Give the uses of D.C. bridges. [2]
- j) Enumerate the different types of temperature measuring devices. [3]

PART – B

(50 Marks)

- 2.a) A 100V moving iron voltmeter is intended for 50Hz, has a resistance of $3K\Omega$. Find the series resistance required to the extent of the range of the instrument to 200V. If the 200V instrument is used to measure a dc voltage of 150V. Find the voltage across the meter?

- b) With relevant diagram, explain the working of True RMS Responding Voltmeters. [5+5]

OR

- 3.a) Explain about dynamic characteristics of measuring instrument.
- b) Briefly discuss the operation of DC Voltmeter with help of neat diagram. [5+5]

- 4.a) Describe the diagram with operation of a harmonic distortion analyser using Wein bridge and frequency selective type.

- b) With relevant diagram, explain the working of video signal generator [5+5]

OR

- 5.a) Explain the working of a standard sweep generator with diagram.
- b) Discuss the principle of RF signal generator operation. [5+5]

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- 6.a) Explain the major parts of CRT with a block diagram
- b) Discuss in detail, the construction and working of a digital sampling oscilloscope. [5+5]

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OR

- 7.a) Explain with the block diagram how the digital frequency can be measured using counter/meter instrument.
- b) Explain with a diagram how frequency and phase can be measured using a Lissajous method. [5+5]

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- 8.a) Draw the diagram of Resistance Thermometer and explain its operation.
- b) Define piezoelectric effect. Write the applications of piezoelectric transducer. [5+5]

OR

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- 9.a) With a neat sketch, explain the operation of LVDT.
- b) With relevant diagram, explain the working of hot wire anemometer. [5+5]

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- 10.a) In the Wheatstone bridge, the values of resistances of various arms are $P= 1000 \Omega$, $Q= 100 \Omega$, $R= 2,005 \Omega$ and $S= 200 \Omega$. The battery has an emf of 5 V and negligible internal resistance. The galvanometer has a current sensitivity of 10 mm/ μ A and an internal resistance of 100 Ω . Calculate the deflection of the galvanometer and the sensitivity of the bridge in terms of deflection per unit change in resistance.

- b) With help of neat diagram, explain the working of any one type of humidity measuring instrument. [5+5]

OR

- 11.a) Derive an equation to find the sensitivity of the wheat stone bridge.
- b) Explain the different type of pressure measuring devises with a relevant diagram. [5+5]

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