R16

Code No: 136BM

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, July - 2023

ELECTRICAL AND ELECTRONICS INSTRUMENTATION

(Electrical and Electronics 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 do you mean by sampled data?	[2]
b)	Distinguish between periodic signal and aperiodic signal.	[3]
c)	List the advantages of Digital voltmeter.	[2]
d)	Explain the significance of a Sweep generator in a CRO.	[3]
e)	Define the term Distortion factor.	[2]
f)	Explain the significance of a basic wave analyser.	[3]
g)	Distinguish between an Active transducer and Passive transducer.	[2]
h)	List the advantages of Electrical transducers.	[3]
i)	Define Gauge Sensitivity.	[2]
j)	How do you measure temperature with transducers?	[3]

PART – B

(50 Marks)

2. Explain the following types of Static errors in detail:
a) Gross errors b) Systematic errors c) Random errors [10]

OR

3.a) Explain about dynamic characteristics of a measuring system.
b) A voltmeter reading 60 V on its 100 V range and an ammeter reading 90 mA on its 150-mA range are used to determine the power dissipated in a resistor. Both these instruments are guaranteed to be accurate within ± 2% at full scale deflection. Determine the limiting error of the power. [6+4]

4.a) Draw and explain the block diagram of a CRO.
b) Explain the working of digital phase angle meter. [5+5]

OR

5.a) Explain the working of ramp type digital voltmeter with a neat block diagram
b) What are Lissajous figures in CRO and explain what you can find frequency and phase from it. [5+5]

6.a) Explain the working of vector impedance meter with a neat diagram.
b) Explain the working of RMS voltmeter with a neat diagram. [5+5]

OR

7. With a neat block diagram, explain the working of heterodyne wave analyser. [10]

8.a) Explain the working of following types of wire strain gauge:
i) unbonded metal strain gauge and ii) bonded strain gauge.

b) A resistance, wire strain gauge with a gauge factor of 4 is bonded to a steel structural member subjected to a stress of 200 MN/m^2. The modulus of elasticity of steel is 400 GN/ m^2. Calculate the percentage in value of the gauge resistance due to the applied stress. [6+4]

OR

9.a) Explain the working of Linear Variable Differential Transformer (LVDT) with a neat diagram.

b) What are Piezoelectric transducers and explain their modes of operation. [5+5]

10. Explain the method of Strain gauge type torque measurement. [10]

OR

11. Explain the method of Ultrasonic liquid level measurement system. [10]

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