R16

Code No: 136BM

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, February - 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)	Define systematic error.	[2]
b)	What is standard? What is the different classification of standards?	[3]
c)	Give few applications of Cathode ray oscilloscope.	[2]
d)	Classify the various types of Digital Voltmeter.	[3]
e)	What is the working principle of spectral display?	[2]
f)	List out the applications of wave analyzer.	[3]
g)	Define piezo electric effect.	[2]
h)	What are the advantages of electrical transducer?	[3]
i)	Write some methods of measurement of temperature.	[2]
j)	How could you measure vacuum using gauges?	[3]

PART – B

(50 Marks)

2.a) Define and explain any five static characteristics of measuring systems.
b) Describe the Statistical Analysis of Random Errors in detailed. [5+5]

OR

3.a) Explain about pulse modulation and pulse code modulation in detail.
b) A signal $x(t) = \text{sinc}(150\pi t)$ is sampled at a rate of i) 100 Hz, ii) 200 Hz, and iii) 300Hz. For each of these cases, explain if you can recover the signal x(t) from the sampled signal. [5+5]

4.a) Describe with neat diagram the construction and working of Cathode ray oscilloscope.
b) How could you measure phase using lissajous pattern? Explain. [5+5]

OR

5.a) Draw the circuit diagram of digital phase angle meter and explain the working.
b) Explain with neat circuit diagram the working of Microprocessor based ramp type. [5+5]

6.a) Discuss the working of frequency selective analyzer with a neat sketch.

b) Explain the concept of wave analysis and with the help of block diagram explain the construction and working of heterodyne wave analyzer. [5+5]

OR

7.a) Explain the Total Harmonic distortion in detail.

b) With the help of block diagram, explain the construction and working vector impedance meter. [5+5]

8.a) What is the principle of operation of a capacitive pressure transducer? Explain in detail

b) Explain the principle of LVDT accelerometer with neat sketch. Also give its advantages and limitations. [5+5]

OR

9.a) Explain in detail the signal conditioning of thermocouple output.

b) Describe the principle and construction of Piezo electric load cell. [5+5]

10.a) Define gauge sensitivity and how could you measure it.

b) Explain the working of two types of ultrasonic flow meter. [5+5]

OR

11.a) Explain the pressure measurement for the following categories:
i) McLeod gauge
ii) Thermal conductivity gauge.

b) Write short notes on the following:
i) Angular velocity
ii) Torque. [5+5]

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