R15

Code No: 125AM

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, May - 2018

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	Define and derive static and Dynamic error.	[2]
b)	Give a classification of voltmeters.	[3]
c)	Distinguish between spectrum analyzer and harmonic distortion analyzer.	[2]
d)	List out the difference between fixed frequency and variable AF oscillator.	[3]
e)	Define deflection sensitivity of a CRT.	[2]
f)	Summarize the advantages of dual beam for multiple trace oscilloscopes.	[3]
g)	List the applications of inductive transducers.	[2]
h)	Summarize the main elements of velocity transducer.	[3]
i)	Derive the balance condition of Bridge.	[2]
j)	List out the different Precautions to be taken when using a Bridge with one example.	[3]

PART - B

(50 Marks)

2.a) What is the principle and operation of a thermocouple type RF ammeter.

b) A voltmeter having a sensitivity of 1KΩ/V is connected across an unknown resistance in series with a milli ammeter reading 80V on 150V scale. When the milli ammeter reads 10mA, Calculate the (i) apparent resistance of the unknown resistor (ii) Actual resistance of the unknown resistor, and (iii) Error due to the loading effect of the voltmeter? [5+5]

OR

3.a) Discuss basic characteristics of measuring devices.

b) A 200 Ω basic movement is to be used as an ohmmeter requiring full scale deflection of 1 mA and internal battery voltage of 5 V. A half scale deflection marking of 2 k is desired. Calculate
i) The values of R1 and R2
ii) Maximum value of R to compensate for a 3% drop in battery voltage. [5+5]

4.a) Discuss square wave and pulse generator with neat block diagrams.
b) How the fundamental frequency is suppressed using fundamental suppression distortion analyser? Explain. [5+5]

OR

5.a) Discuss how function generator generates sine wave, triangular wave and square wave.
b) Describe the functions of an attenuator in a signal generator. [5+5]

6.a) Describe the Measurement procedure of Lissajous patterns with one example.
b) Discuss the principle and working of Q-meter. [5+5]

OR

7.a) Explain the internal structure of CRT and describe the principle of electrostatic focusing.
b) Sketch the basic block diagram for a digital storage oscilloscope and explain the operation. [5+5]

8.a) Explain the working of capacitive transducers.
b) Discuss the operation of potentiometric transducer. [5+5]

OR

9.a) A thermistor has a resistance of 3980 Ω at the ice point (0^0C) and 749Ω at 50^0C. The resistance temperature relationship is $R_T = a\ R_0\ eb/T$. Find the values of a and b. Calculate the resistance to be measured in case the temperature varies from 400C to 100^0C?
b) Describe the construction and working of LVDT. [5+5]

10.a) Explain the operation of wheat stone bridge with derivations.
b) Derive the expression for unknown resistance in Kelvin double bridge. [5+5]

OR

11.a) Explain the sources of errors and their minimizing methods.
b) Discuss various methods of connecting components to a Q-meter for measurement. [5+5]

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