R09

Code No: 09A70203

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, November - 2013

Instrumentation

(Electrical and Electronics Engineering)

Time: 3 Hours **Max. Marks: 75**

Answer any Five Questions

All Questions Carry Equal Marks

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1. Distinguish between systematic and random errors in a measurement and how they are usually minimized. [15]

2.a) Explain the common forms of periodic signals with their waveforms.
b) What is complex form representation of a periodic signal? [7+8]

3.a) Draw the schematic of a CRT and explain its operation.
b) The X – deflection plates in a CRT are 1mm apart and 30 mm long. The centre of the plate is 25cm from the screen. The accelerating voltage is 3500V. Find the V_{rms} of the Sinusoidal Voltage applied to x – deflection plates, if the length of trace is 12cm. Find S_E (with usual notations). [7+8]

4.a) Explain in detail about integrating type DVM.
b) Explain the successive approximation conversion techniques. [7+8]

5.a) Explain in detail about basic spectrum analyzer.
b) Write short notes on spectral displays. [7+8]

6.a) Explain in detail about photo diode and photo transistors.
b) Explain in detail about thermocouples. [7+8]

7.a) Explain the method for the strain gauge calibration.
b) Four strain gauges are mounted on a simple at tensile specimen arranged for complete temperature compensation and maximum sensitivity when connected in four arm bridge circuit. A 0.8MΩ calibration resistor is shunted across one of the strain gauges, gauge resistances are each 118Ω and gauge factors are 1.22. If the gauge read out is 150 divisions when the calibration switch is closed and240 divisions when load is applied, calculate the axial strain in the specimen. [7+8]

8.a) Explain the flow measurements using thermistors.
b) Explain the principles and operation of ultrasonic flow meters. [7+8]

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