CBCS Scheme

USN | | | | | | | | | | |

15EC35

Third Semester B.E. Degree Examination, Dec.2017/Jan.2018
Electronic Instrumentation

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. Define: i) Absolute error ii) Significant Figures. **(04 Marks)**

b. A component manufacturer constructs certain resistors to be anywhere between 1.14kΩ and 1.26kΩ and classifies them as 1.2kΩ resistors. What tolerance should be stated? If the resistance values are specified at 25°C and the resistors have a temperature coefficient of +500ppm/°C, calculate the maximum resistance of one of these components at 75°C. **(06 Marks)**

c. Design a multirange ammeter with range of 0-1A, 5A, and 10A employing individual shunt at each A D'Arsonval movement with an internal resistance of 500Ω and a full scale deflection of 10mA is available. **(06 Marks)**

OR

2 a. Calculate the value of multiplier resistance on the 50V range of a dc voltmeter that uses a 500μA meter movement with an internal resistance of 1kΩ. **(04 Marks)**

b. Explain true RMS voltmeter with a neat diagram. **(06 Marks)**

c. Two different voltmeters are used to measure the voltage across R_b in the circuit of Fig. 2(c). The meters are as follows :
Meter 1 : S = 1kΩ/V, R_m = 0.2k, range 10V
Meter 2 : S = 20kΩ/V, R_m = 1.5k, range 10V
Calculate :
i) Voltage across R_b without any meter across it
ii) Voltage across R_b when the meter 1 is used
iii) Voltage across R_b when the meter 2 is used
iv) Error in the voltmeters.

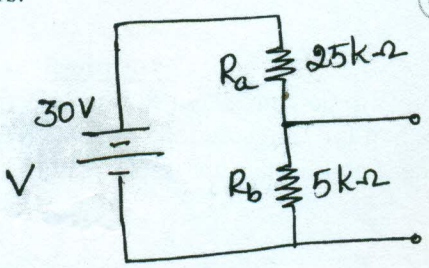

Fig. Q2(c) **(06 Marks)**

Module-2

3 a. Explain the working of successive approximation DVM with the help of block diagram. **(08 Marks)**

b. Draw basic block diagram of a microprocessor based ramp type DVM and explain its operation with waveforms. **(08 Marks)**

OR

4 a. Explain digital frequency meter with the help of block diagram. **(08 Marks)**
b. Explain digital pH meter. **(08 Marks)**

Module-3

5 a. Explain the function of various blocks in CRO with suitable diagram. **(06 Marks)**
b. Explain the working of Time base generator. **(06 Marks)**
c. Discuss frequency measurements with Lissajous figures. **(04 Marks)**

OR

6 a. Explain function generator with suitable diagram. **(08 Marks)**
b. Explain sweep generator with block diagram. **(08 Marks)**

Module-4

7 a. Explain Q-meter with suitable circuit diagram. **(06 Marks)**
b. Explain Basic Megger Circuit. **(06 Marks)**
c. Discuss stroboscope. **(04 Marks)**

OR

8 a. Explain the Wheatstone bridge and using Thevenin's theorem, determines the amount of deflection due to unbalance of Wheatstone Bridge. **(08 Marks)**
b. An inductance comparison bridge is used to measure inductive impedance at a frequency of 5KHz. The bridge constants at balance are $L_3 = 10mH$, $R_1 = 10k\Omega$, $R_2 = 40k\Omega$, $R_3 = 100k\Omega$. Find the equivalent series circuit of the unknown impendence. **(04 Marks)**
c. Write a note on Wagner's earth connection. **(04 Marks)**

Module-5

9 a. What are the factors to be considered for the selection of better transducer? **(04 Marks)**
b. Derive an expression for gauge factor for Bonded Resistance wire strain Guages. **(08 Marks)**
c. Mention advantages and limitation of thermistor. **(04 Marks)**

OR

10 a. Explain the construction, principle and operation of LVDT. Show characteristics curve. **(10 Marks)**
b. Explain Piezoelectric Transducer. **(06 Marks)**

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