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

15EC35

Third Semester B. E Degree Examination, June/July 2017

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 types of static errors. How do you avoid them? **(06 Marks)**
   b. Design a multi-range ammeter with range of 0 – 1A, 5A and 10A employing individual shunt in each A D'Arsonval movement with an internal resistance of 500Ω and a full scale deflection of 10mA is available. **(05 Marks)**
   c. Define principle operation of thermocouple, and also explain types of thermocouple. **(05 Marks)**

OR

2 a. What is loading effect? **(02 Marks)**
   b. Calculate series connected multiplier resistances with a D'Arsonval movement with an internal resistance of 100Ω and a full scale deflection of 10mA into a multirange dc voltmeter with ranges from 0-5V, 0-50V and 0-100V. **(04 Marks)**
   c. Explain Differential voltmeter with circuit. **(05 Marks)**
   d. Explain the working of a true RMS voltmeter with the help of a suitable block diagram. **(05 Marks)**

Module-2

3 a. With neat block diagram explain Dual slope integrating meter, and also derive the unknown voltage equation. **(08 Marks)**
   b. An integrator contains a 100KΩ and 1μF capacitor, if the voltage applied to the integrator input is 1V, what voltage will be present at the output of the integrator after 1sec? **(02 Marks)**
   c. With block diagram, explain principle operation of staircase ramp **(06 Marks)**

OR

4 a. With neat circuit diagram, explain basic frequency measurement operation. **(06 Marks)**
   b. Explain with block diagram Digital phase meter operation. **(06 Marks)**
   c. Define Tachometer and pH meter. **(04 Marks)**

Module-3

5 a. With neat circuit diagram explain time base generator with waveform. **(06 Marks)**
   b. Explain in detail the working of digital storage oscilloscope and list advantages. **(10 Marks)**

OR

6 a. Explain with diagram conventional standard signal generator. **(08 Marks)**
   b. Explain in detail the working of a function generator. **(08 Marks)**

Module-4

7 a. With circuit diagram explain Q – meter and its purpose. **(05 Marks)**

b. Self capacitance of a coil is measured, if the first measurement is at f_1 = 1MHz and C_1 = 500pf. The second measurement is at f_2 = 2MHz and C_2 = 110pf. Find the distributed capacitance also calculate the value of L. **(04 Marks)**

c. Define Megger instrument. With circuit diagram explain megger. **(07 Marks)**

OR

8 a. Define use of Maxwell's bridge. With circuit diagram derive and explain Maxwell's bridge equation. **(08 Marks)**

b. A wein bridge circuit consists of the following components R_1 = 4.7 KΩ, C_1 = 5nf, R_2 = 20KΩ, C_3 = 10nf, R_3 = 10KΩ, R_4 = 100KΩ. Determine the frequency of the circuit. **(02 Marks)**

c. Explain in detail with circuit Wagner's earth connection. **(06 Marks)**

Module-5

9 a. What are the factors to be considered for the selection of transducer? **(06 Marks)**

b. Explain principle operation of resistive position transducer. **(04 Marks)**

c. Explain resistive thermometer, list the advantages. **(06 Marks)**

OR

10 Briefly write a note on :

a. Strain gauges **(04 Marks)**

b. Differential output transducer **(04 Marks)**

c. Piezoelectrical transducer **(04 Marks)**

d. Semiconductor photo diode. **(04 Marks)**

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