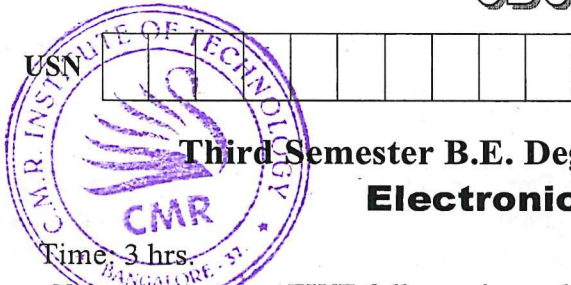


# CBCS SCHEME



17EC32

Third Semester B.E. Degree Examination, Jan./Feb. 2021

## Electronic Instrumentation

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- Define the following with examples : i) Accuracy ii) Precision iii) Resolution  
iv) Significant figures v) Absolute error. (05 Marks)
  - Explain basic DC Ammeter and design multirange ammeter to measure 0-10mA, 0-2mA, 0-50mA having basic meter with full scale deflection of 1mA and internal resistance 100Ω. (10 Marks)
  - Explain true RMS voltmeter with a neat diagram. (05 Marks)

OR

- Write a short note on loading of voltmeter and find :  
i) Voltage across R<sub>2</sub> using meter1 and meter2 in the following Fig.Q2(a)(i).

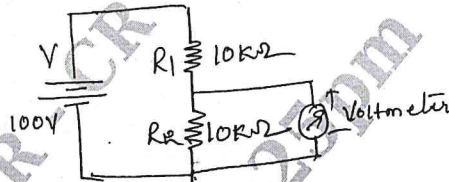


Fig.Q2(a)(i)

- Which meter provides the accurate result?
  - Error in the voltmeters.  
Given that meter 1 : 1000Ω/V over range 50V  
meter 2 : 20000Ω/V over range 50V. (10 Marks)
  - Explain AC voltmeter with full wave rectifier and compute the value of multiplier for 100Vms input for full wave rectifier voltmeter with basic meter having full scale deflection of 1mA and internal resistance 500Ω. (07 Marks)
  - Write a note on measurement error combinations. (03 Marks)

### Module-2

- Explain the basic principle used in ADC. (05 Marks)
  - With the help of neat diagram, explain dual slope integrating type DVM. Mention specifications of DVM. (10 Marks)
  - Explain Digital pH-meter. (05 Marks)

OR

- Explain digital frequency meter with the help of block diagram. (10 Marks)
  - Explain digital Tachometer. (05 Marks)
  - What do you mean by 3½ digit display? Explain. What is the resolution of 3½ digit DDM over IV range and 10V range. (05 Marks)

### Module-3

- Explain the block diagram of CRO. (07 Marks)
  - Explain Digital Storage Oscilloscope. (07 Marks)
  - Explain the working of AF Sine and Square Wave Generator. (06 Marks)

OR

- 6 a. With the help of neat block diagram, explain Function Generator. (08 Marks)  
 b. Explain the working of Standard Signal Generator. (07 Marks)  
 c. Discuss frequency measurements with Lissajous figures. (05 Marks)

**Module-4**

- 7 a. Explain Q-meter with suitable circuit diagram. (08 Marks)  
 b. With neat circuit diagram explain phase meter. (08 Marks)  
 c. Obtain the balance equations for capacitance comparison bridge. (04 Marks)

OR

- 8 a. Explain the Wheat Stone bridge and using Thevenin's theorem, determine the amount of deflection due to unbalance of Wheat Stone bridge. (10 Marks)  
 b. In the following Fig.Q8(b) ratio of  $R_a$  to  $R_b$  is  $1000\Omega$ ,  $R_1 = 5\Omega$ ,  $R_1 = 0.5R_2$ . Find  $R_x$ .

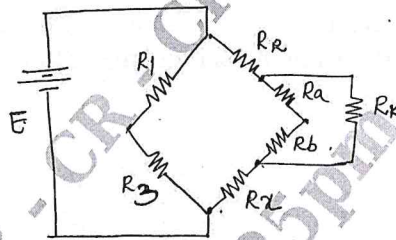


Fig.Q8(b)



- c. Explain Megger circuit.

(05 Marks)  
(05 Marks)**Module-5**

- 9 a. What are the factors to be considered while selecting a better transducer? Explain. (08 Marks)  
 b. Explain LVDT and show characteristic curve along with its applications. (07 Marks)  
 c. Explain Piezoelectric transducer. (05 Marks)

OR

- 10 a. Explain Semiconductor photodiode and transistor. (07 Marks)  
 b. What is resistance thermometer? Explain. (06 Marks)  
 c. A displacement transducer with a shaft stroke of 3.0 inch is applied to the following circuit shown in Fig.Q10(c). The total resistance of potentiometer is  $5K\Omega$ , applied voltage is 5V. When the Wiper is 0.9 inch from B, what is the total output voltage?

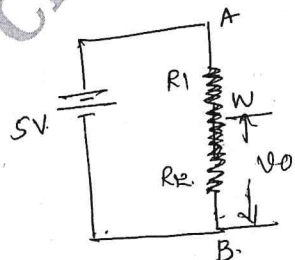


Fig.Q10(c)

(07 Marks)

\*\*\*\*\*