**BECT- 302**

Roll No. | | | | | | | | | | |

ODD SEMESTER EXAMINATION, 2019-20

B.Tech. (Semester- III)

**ELECTRONIC MEASUREMENT AND INSTRUMENTATION**

**Time: 3 Hours** **Total Marks: 100**

**Total no. of printed pages: 2**

**Note:** Attempt all questions. All questions carry equal marks.

**1. Attempt any four parts:** **5x4=20**

a) What is Dynamic Response? Explain the various types of dynamic response. How are they differ from dynamic characteristics?

b) A voltmeter has a range of 0-10 V. The true value of the measured voltage is 5V, while the read value is 5.95. What is the absolute error and relative error?

c) Write the need of calibration and explain process of calibration.

d) Distinguish between direct and indirect methods of measurement. Give examples to support your answer.

e) What is the principle of working of magnetic recorders? Explain the recording process.

f) Differentiate between accuracy and precision.

**2. Attempt any four parts:** **5x4=20**

a) Compare features of digital and analog voltmeters based on advantages and applications.

b) Write the different DSO applications.

c) Derive an expression for the sensitivity of a Wheatstone bridge.

d) Explain Series ohmmeter.

e) Write a short note on PMMC instruments.

f) Derive the inductance formula for Maxwell's bridge with suitable diagram.

**3. Attempt any two parts:** **10x2=20**

a) (i) Draw the scheme of a Multi-range ammeter. Design a multi-range DC ammeter with an internal resistance 10Ω. The full scale deflection currents is 10mA and it is required to measure 0to 50mA, 0 to 100mA and 0 to 250mA.

**P.T.O**

(ii) Bring out the difference between CRO and recorders. Draw the schematic of a simple X-Y recorder.

**b)** Explain the working of Digital Data Recording. Give its applications.

**c)** (i) Define the following with respect to the measuring system:

(1) True value (2) Static correction

(3) Relative error (4) Reproducibility

(ii) Explain the working of a True RMS voltmeter.

**4. Attempt any two parts:** **10x2=20**

**a)** Define Sensitivity and deflection factor of a Cathode Ray Tube (CRT). What are the role of the following in CROs:

(i) Isolation Shield

(ii) Time base generator circuit

(iii) X-Channel

(iv) Triggered Sweep

**b)** A voltmeter having a sensitivity of 100V on its 150 V scale when connected across an unknown resistor in series with a mili-ammeter. When the mili-ammeter reads 5mA, Calculate

(i) apparent resistance of the unknown resistor.

(ii) actual resistance of the unknown resistor and

(iii) error due to the loading effect of voltmeter.

**c)** Explain D/A and A/D coverters w.r.t signal conditioning of the inputs.

**5. Attempt any two parts:** **10x2=20**

**a)** Explain the basic elements of a function generator. What is the importance of (i) Duty Cycle (ii) Rise time

**b)** (i) Explain with the help of a diagram the working of simple multimeter.

(ii) Explain an arrangement for the measurement of Standing Wave Ratio.

**c)** Draw a circuit diagram of Q-meter and explain its working. Give its applications.