Registration No : | | | | | | | | | | |

Total Number of Pages : 02 **B.TECH**

PEI3I102

3rd Semester Back Examination 2019-20

ELECTRICAL AND ELECTRONICS MEASUREMENT

BRANCH : AEIE, EIE, IEE

Max Marks : 100

Time : 3 Hours

Q.CODE : HB684

Answer Question No.1 (Part-1) which is compulsory, any EIGHT from Part-II and any TWO from Part-III.

The figures in the right hand margin indicate marks.

Part- I

Q1 **Only Short Answer Type Questions (Answer All-10)** **(2 x 10)**

a) Briefly differentiate between Accuracy and Precision of measurement.

b) In a D'Arsonval galvanometer, an iron core is usually used between the permanent magnet pole faces, explain with reasons.

c) A moving coil instrument gives full scale deflection of 15mA when the potential difference across its terminals is 300mV . Calculate, the shunt resistance for measuring upto 25 Amp.

d) Give two examples of (i) Integrating type of Instruments (ii) Secondary Instruments.

e) Give at least two most common methods for measurement of low resistance.

f) For 20A, 230V energy meter, the revolution per Kilowatt-hour is 480. If upon test at full load unit power factor the disc makes 40 revolution in 66 seconds, calculate the error in the energy meter.

g) Differentiate between sensors and transducers.

h) Briefly explain, "standardization" in a slide wire potentiometer.

i) A Lissajous pattern on an oscilloscope is stationary and has 5 vertical maximum values and 4 horizontal maximum values. The frequency of the horizontal input is 1200 Hz. What is the frequency of vertical input?

j) Give Reasons, the secondary of a CT is never left open circuited.

Part- II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) What are the differences between static and dynamic characteristics of instruments?

b) State various types of frequency meters and explain the working of a vibrating reed type frequency meter.

c) Derive the equation of balance of a Schering Bridge. Draw the phasor diagram under null conditions and explain how loss angle of capacitor can be calculated.

d) The following readings were obtained during the measurement of a low resistance using a potentiometer. Voltage drop across a 0.1 Ω standard resistance is 1.0235V Voltage drop across the low resistance under test=0.4221V Calculate the value of unknown resistance, current and power lost in it.

e) Briefly explain the calibration and adjustments of a single-phase induction type energy meter.

f) Derive the equation of balance of a Schering Bridge. Draw the phasor diagram under null conditions and explain how loss angle of capacitor can be calculated.

g) Explain the Kelvin's Double bridge and obtain the balance condition.

h) Explain the term standardization of a potentiometer. Describe the procedure of standardization of a d.c potentiometer.

i) Explain the operation of LVDT, with help of a diagram.

j) How the frequency is converted to an analog signal? Explain.

k) Explain any one bridge circuit for measurement of Inductance.

l) Discuss the common sources of error in an AC bridge. How are they eliminated?

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 **a)** Describe the construction and working of PMMC instrument. Derive the equation for deflection if the instrument is spring controlled. **(10)**

b) Discuss the theory and principle of operation of Electro-Dynamometer type wattmeter. **(6)**

Q4 **a)** What is a megger? Why is it used? Explain the working principle of Megger with relevant diagram. **(10)**

b) Discuss the importance of Wagnor Earthing Device in AC bridges.

Q5 **a)** Describe the working of a Ballistic Galvanometer and compare it with a D'Arsonval Galvanometer. **(6)**

b) Discuss the constructional features of a Polar type Potentiometer.

Q6 **a)** With a neat diagram explain the main parts and working of Cathode Ray Oscilloscope. With a neat schematic, explain the operation of a dual slope analog to digital conversion. **(10)**

b) Describe a true r.m.s reading voltmeter with neat sketches. **(6)**