ASSIGNMENT 1 : Introduction to measurement

Instructions: Please download, print, provide answers using the spaces provided, scan and submit on vclass before or on the due date.

QUESTION

1. What the aid of a well labelled diagram of a typical measuring system, describe the functions of the major components of an electrical measuring system.

2. Define the terms sensitivity, accuracy, linearity and resolution in relation to measuring instrument performance.

3. The inductance of an inductor is specified as 20 H ± 10% by a manufacturer. Determine the limits of inductance between which it is guaranteed.

ASSIGMENT 2 - Sources and Types of Errors

Instructions: Please download, print, provide answers using the spaces provided, scan and submit on vclass before or on the due date.

QUESTION

1. **Describe the principle of operation of a piezoelectric (vehicular) traffic sensor.**

2. **Give two advantages and two disadvantages of piezoelectric (vehicular) traffic counter over infrared based counters.**

ASSIGNMENT 3 - Analogue Indicating Instruments and Applications

Instructions: Please download, print, provide answers using the spaces provided, scan and submit on vclass before or on the due date.

QUESTION

1. With the aid of a labelled diagram, describe how a Permanent Magnet Moving Coil Ammeter Works.

2. Derive an expression relating the measured current and the control torque (assuming spring control).

3. A PMMC Ammeter with a 20 Ω coil resistance has a full-scale deflection of 10mA. A 0.02 Ω resistor is placed across the meter to increase its rating capacity. What is the new full-scale current in Amperes of the meter?

ASSIGMENT 4 - Measurement of Electrical Quantities

Instructions: Please download, print, provide answers using the spaces provided, scan and submit on vclass before or on the due date.

QUESTION

1. With the aid of a circuit diagram, describe the three ammeter method for measuring an active power in an electrical circuit.

2. Derive an expression for the active power using the three measurements.

ASSIGNEMENT 6 - Measurement of impedances

Instructions: Please download, print, provide answers using the spaces provided, scan and submit on vclass before or on the due date.

QUESTION

1. **Describe the principle of operation of the Owen's Bridge and derive an expression for the unknown inductance and its internal resistance.**

2. **Derive an expression for the Q-factor for the unknown inductance.**

ASSIGNMENT 7 - CRO

Instructions: Please download, print, provide answers using the spaces provided, scan and submit on vclass before or on the due date.

QUESTION

1. With the aid of a well labelled diagram, describe the principle of operation of a CRO.

ASSIGNMENT 8 - SCADA SYSTEMS

Instructions: Please download, print, provide answers using the spaces provided, scan and submit on vclass before or on the due date.

QUESTION

Name four major components of a SCADA system and give one function for each.