**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.**

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

1. **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.**

1. **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.**

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

1. **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.**

1

1. **Derive an expression for the active power using the three measurements.**

2

**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.**

1. **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.**