# MACHAKOS UNIVERSITY

**University Examination 2018/2019**

### SCHOOL OF ENGINEERING AND TECHNOLOGY
### DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
### FIRST YEAR SECOND SEMESTER EXAMINATION FOR
### ARTISAN IN ELECTRICAL AND ELECTRONIC ENGINEERING
### 0202/213: TRADE THEORY

**DATE: 18/4/2019**                                            **TIME: 11.30-2.30 PM**

**INSTRUCTIONS:**

*Answer question one and any other two questions*

**QUESTION ONE (30 MARKS)**

a)      Define the following terms stating their symbols and units

      i.       Current

      ii.      Resistor

      iii.     Voltage

      iv.      Power                                                               (16 marks)

b)      state the uses of the following measuring instruments

      i.       Wattmeter

      ii.      Voltmeter

      iii.     Ohmmeter

      iv.      Ammeter                                                            (8 marks)

c)      explain the three factors that affects the resistance of a resistor          (6 marks)


**QUESTION TWO (20 MARKS)**

a)      State ohms law                                                              (5 marks)

b)      Prove that for a parallel  connected resistors the total resistance is given a

$$RT = \frac{R1 \times R2}{R1 + R3}$$                                                  (10 marks)

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*Examination Irregularity is punishable by expulsion*                     Page **1** of **2**

c)    Five resistors with the following resistances 40Ω,30Ω,20Ω,50Ω, and 20Ω are connected in parallel, calculate the total connected resistance.            (5 marks)

d)    Prove that for three resistance connected in series the total resistance is given as

RT=R3+R1+R3                                                                                                (5 marks)

**QUESTION THREE (20 MARKS)**

a)    state the meaning  of the following abbreviations of prefixes used with electrical units

    i.      Ω

    ii.     μ

    iii.    π

    iv.    k                                                                                                                (8 marks)

    v.     M

b)    Covert the following units into milliohms

    240Ω 3000Ω 2 kΩ

    Convert the following into watts

    4kilowatts, 60kilowatts 5 kilowatts                                                              (12 marks)

**QUESTION FOUR (20 MARKS)**

Five resistors 50Ω,60Ω,40Ω,35Ω, and25Ω are connected in series with a 240 volts' calculate

 The total resistance

The current

The power

The energy if the current flows for 5seconds

**QUESTION FIVE (20 MARKS)**

a)    A current of 4A flows in a resistor R when a potential difference of 240 v is connected. Determine its resistance                                                                                (6 marks)

b)    A 100kvA 3300/400v 50 HZ single phase transformer has 110 turns on the secondary. Calculate the approximate values of   the primary and secondary full load currents. The maximum value of the flux in the core and the number of primary turns        (14 marks)