



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
- Current
 - Resistor
 - Voltage
 - Power (16 marks)
- b) state the uses of the following measuring instruments
- Wattmeter
 - Voltmeter
 - Ohmmeter
 - 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

$$R_T = \frac{R_1 \times R_2}{R_1 + R_2} \quad (10 \text{ marks})$$

- c) Five resistors with the following resistances $40\Omega, 30\Omega, 20\Omega, 50\Omega$, 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
 $R_T = R_3 + R_1 + R_3$ (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) Convert the following units into milliohms
 240Ω 3000Ω $2\text{ k}\Omega$
- Convert the following into watts
 4kilowatts , 60kilowatts 5 kilowatts (12 marks)

QUESTION FOUR (20 MARKS)

Five resistors $50\Omega, 60\Omega, 40\Omega, 35\Omega$, and 25Ω 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 $100\text{kV}/3300/400\text{V}$ 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)