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**University Examinations 2014/2015**

FIRST YEAR, FIRST SEMESTER EXAMINATION FOR DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING

**EEE 0201: ELECTRICAL ENGINEERING PRINCIPLE 1**

**DATE: DECEMBER 2014 TIME: 1**$\frac{1}{2}$ **HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. (i) Two resistors of 6 ohms and 12 ohms are connected in parallel. A 2 ohm resistor is then connected in series to the combination. If a 24v supply of negligible internal resistance is connected across the circuit: (6 marks)
2. Draw the connection diagram
3. Use ohm’s law to find the current in each branch of the circuit
4. Find the p.d across the parallel branch
5. State Kirchhoff’s
6. Current law (**1**$\frac{1}{2}$mark**s)**
7. Voltage law (**1**$\frac{1}{2}$mark**s)**
8. Use Kirchhoff’s law to find current flowing in each branch of the circuit in figure 1 below and hence determine power dissipated in the 10 ohm resistor.

Resistors are in ohms (8 marks)

1. Define the following terms as used in magnetic circuits and state the unit of measurement in each case (6 marks)
2. Magnitomotive force
3. Magnetic flux intensity
4. Permeability
5. Relative permeability
6. State Faraday’s laws of electromagnetic induction and explain briefly one area of application (4 marks)
7. Explain briefly the difference between the primary cells and the secondary cell (3 marks)

**QUESTION TWO (15 MARKS)**

1. State any
2. Five types of capacitors (5 marks)
3. Three applications of capacitors (3 marks)
4. With the aid of a sketch show that the equivalent resistance R, of three resistors of resistances R1, R2 and R3 connected in parallel is given by the equation:

 (5 marks)

1. Define the term resistivity as used in connection with the conductivity of materials (2 marks)

**QUESTION THREE (15 MARKS)**

1. A magnetic circuit has a coil of 120 turns. The cross-section area and the length of the magnetic circuit is 5cm2 and 25cm respectively. When the current is 1.5A, the total flux is 0.3 milliwebbers. For a current of 5A, the total flux is 0.6 milliwebbers. Find the; (12 marks)
2. Magnetic field in each case
3. Relative permeability of the core
4. Draw two coils connected in series opposing (3 marks)

**QUESTION FOUR (15 MARKS)**

1. With the aid of a diagram describe the constant current method of charging a battery

 (10 marks)

1. A coil of resistance 100ohms is placed in a magnetic field of 1 milliwebber. The coil has 100 turns and a galvanometer of 400 ohms resistance is connected in series with it. Find the average emf and the current produced if the coil is moved 0.1 seconds form the given field to 0.2 milliwebber (5 marks)