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**University Examinations 2015/2016**

FIRST YEAR, FIRST SEMESTER EXAMINATION FOR THE CERTIFICATE IN ELECTRICAL INSTALLATION

**EEE 1100: ELECTRICAL ENGINEERING PRINCIPLES I**

**DATE: DECEMBER, 2016 TIME: 11/2 HOURS**

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

**QUESTION ONE (30 MARKS)**

1. State Ohm’s law. (2 Marks)
2. Give four factors that affect the resistance of an electrical conductor . (4 Marks)
3. There are two main defects of primary cells. Give and define them. (6 Marks)
4. A portable machine requires a force of 200N to move it. How much work is done if the machine is moved 20m and what average power is utilized if the movement takes 25 seconds? (4 Marks)
5. Calculate the resistance and the supply current of the circuit below. (5 Marks)
6. If a current of 16A flows for 0.04 seconds, find the quantity of electricity transferred.

(2 Marks)

1. Give four types of capacitors. (4 Marks)
2. A coil of copper wire has a resistance of 100$Ω$ when its temperature coefficient of resistance of copper at 00C. Determine its resistance at 700C if the temperature coefficient of resistance of copper at 0ºC is 0.0043/ ºC. (3 Marks)

**QUESTION TWO (15 MRKS)**

1. Find the power dissipated when;
2. A current of 5mA flows through a resistance of 20k$Ω$ .
3. A voltage of 400V is applied across a 120kV resistor.
4. A voltage applied to a resistor is 10kV and the current flow is 4mA.
5. Give three effects of electric current and one application in each. (6 Marks)

**QUESTION THREE (15 MARKS)**

1. The resistance of a 5m length of wire is 600$Ω$. Determine:
2. The resistance of an 8m length of the same wire. (3 Marks)
3. The length of the same wire when the resistance is 420$Ω$. (2 Marks)
4. Mention four ways of maintaining lead-acid cells. (4 Marks)
5. What are the effects of corrosion? Which methods can be used to prevent them? Give three in each. (6 Marks)
6. Give two advantages of alkaline cell over a lead-acid cell. (2 Marks)

**QUESTION FOUR (15 MARKS)**

1. Ten 2.2V cells, each having an internal resistance of 0.1$Ω$ are connected in series to a load of 21$Ω$. Determine;
2. The current flowing in the circuit. (3 Marks)
3. The p.d at the battery terminals. (2 Marks)
4. For the circuit below, determine; $V\_{1}=5V,V\_{2}=2V$ and $V\_{3}=6V$
5. The battery voltage (V) (2 Marks)
6. The total resistance of the circuit. (2 Marks)
7. The values of resistance of resistors $R\_{1}R\_{2}$and $R\_{3}$ (3 Marks)
8. A source e.m.f of 5V supplies a current of 3A for 10 minutes. How much energy is provided in this time? (3 Marks)