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UNIVERSITY OF GHANA

BACHELOR OF SCIENCE IN ENGINEERING
FIRST SEMESTER RESIT EXAMINATIONS: 2016/2017

DEPARTMENT OF COMPUTER ENGINEERING
FAEN 106 : APPLIED ELECTRICITY (3 Credits)

INSTRUCTION: *Answer All Questions*

TIME ALLOWED: *TWO AND HALF (2½) HOURS*

1. **(a)** With the support of a waveform diagram, briefly explain difference between an AC and DC source. Give three characteristics that make AC sources different from DC voltage and current sources. [7 marks]

   (b) The voltage from the socket in a house is described by the equation: [4 marks]
   $v(t) = 230\cos(100t + 20)$.
   Find the peak-to-peak voltage, the frequency, phase, and the RMS voltage.

   (c) Suppose the electric cable connecting your phone charger to 230V source at the socket has rectangular cross sectional area of 4.5cm by 0.25cm. If the length of the wire is 20m, find the resistance of the wire and the amount of current that will flow through the wire. Assume the resistivity $\rho = 1.724 \times 10^{-8}$ Ω-m. [5 marks]

   (d) A 3.5kW bread toaster connected to a 230V source is used for 10 minutes every day. Find the following:

   (i) resistance of the toaster and the amount of current drawn. [4 marks]

   (ii) how much energy is consumed in KWh and the total cost of operating the toaster for the month of January if the unit cost of energy is GHC 0.25. Assume the total service charge is GHC 8.50. [5 marks]

2. **(a)** What is electric shock? Briefly explain how a person can receive electric shock. List four factors that could enhance electric shock. [8 marks]

   (b) A person touching a refrigerator received severe electric shock when a current