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**KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**UNIVERSITY EXAMINATION, 2016/2017 ACADEMIC YEAR**  
**FIRST YEAR, SECOND SEMESTER EXAMINATION**  
**FOR THE DEGREE OF BACHELOR OF SCIENCE**  
**(COMPUTER SCIENCE)**

Date: 12<sup>th</sup> August, 2016.  
Time: 8.30am – 10.30am

**KPH 102 - PHYSICS II**

**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE (30 MARKS)**

- a) What do you understand by chemical effect of the currents? (2 Marks)
- b) Define the following terms;
- i) Photon
  - ii) Threshold frequency
  - iii) Anion
  - iv) Voltmeter
- (4 Marks)
- c) Explain what is Electric Field and state both Kirchohoffs laws. (4 Marks)
- d) Determine the power dissipated by the element of an electric fire of resistance  $20\Omega$ . When a current of 10 A flows through it. If the fire is on for 6 hours determine the energy used and the cost of 1 unit of electricity costs 7ksh. (4 Marks)
- e) A 100 W electric light bulb is connected to a 250 V supply. Determine;
- i) The current flowing in the bulb
  - ii) The resistance of the bulb.
- (5 Marks)

- d) A radioactive material emits photons, each having energy of  $1.6 \times 10^{-13}$  J. Calculate the frequency of the electromagnetic radiation emitted by the radioactive material. (4 Marks)
- e) What are the Faraday's laws of electrolysis? (4 Marks)
- f) What are the current carriers in solid conductors, liquids and gases? (3 Marks)

**QUESTION TWO (20 MARKS)**

- a) What is a rectifier? With the help of explain one type of rectifier? (7 Marks)
- b) Eight cells, each with an internal resistance of  $0.2 \Omega$  and an e.m.f. of  $2.2 \text{ V}$  are connected;
- i) In series
- ii) In parallel.
- Determine the e.m.f. and the internal resistance of the batteries so formed. (6 Marks)
- c) An electric kettle has a resistance of  $30 \Omega$ . What current will flow when it is connected to a  $240 \text{ V}$  supply? Find also the power rating of the kettle. (4 Marks)
- d) Distinguish between ionic and electronic conduction (3 Marks)

**QUESTION THREE (20 MARKS)**

- a) State the experimental facts regarding photoelectric effect (5 Marks)
- b) With a neat diagram what principle do Transformers work (6 Marks)
- c) Explain the Advantages and disadvantages of an alkaline cell (8 Marks)

**QUESTION FOUR (20 MARKS)**

- a) Why alternating current is more used? (2 Marks)
- b) What is the difference between AC and DC current? (6 Marks)
- c) What do you understand by the term electrolytic dissociation? (4 Marks)
- d) Solid sodium chloride is a non-conductor of electricity. However, in fused state, it conducts electric current. Explain. (6 Marks)
- e) Explain how charges flow. (4 Marks)

**QUESTION FIVE (20 MARKS)**

- a) Determine the maximum kinetic energy of photoelectron ejected from the surface of metal by light of wavelength of  $3000 \text{ \AA}$ , threshold wavelength of metal =  $4500 \text{ \AA}$ . (6 Marks)
- b) A source e.m.f. of 5V supplies a current of 3A for 10 minutes. How much energy is provided in this time? (4 Marks)
- c) Differentiate between conductor, insulator and semiconductor. (4 Marks)
- d) State and explain ohm's law. (6 Marks)