



MACHAKOS UNIVERSITY

University Examinations 2017/2018

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

FIRST YEAR FIRST SEMESTER EXAMINATION

DIPLOMA IN ELECTRICAL ENGINEERING

EPC 107: ANALOGUE ELECTRONICS

DATE: 20/12/2017

TIME: 8:30 – 10:30 AM

INSTRUCTIONS TO CANDIDATES:

This paper consists of FIVE Questions. Answer Question ONE and ANY OTHER TWO questions.

All answers should be written on the exam booklet provided. Do not use the question paper for answers.

Instructions

Answer all questions.

1.
 - a. Differentiate between the following electronic materials
 - i. Conductors
 - ii. Insulators.
 - iii. Semiconductors (6 marks)
 - b. From (a) above, identify three electronic materials of each. (9 marks)
 - c. Explain the effect of temperature on a copper wire (5 marks)
 - d. Explain the importance of electronics in industry today. (10 marks)
2.
 - a. By the aid of a well labeled diagram, show the Bohr model of a copper atom (7 marks)
 - b. with the aid of a diagram, explain briefly the atomic structure of a silicon atom. (7 marks)
 - c. Show the covalent bonding of the element in (b) above. (6 marks)
3.
 - a. Explains the following electronic concepts
 - i. Silicon has a negative temperature coefficient (3 marks)
 - ii. Silicon is a widely used semiconductor material (3 marks)

- b. Describe the following
- i. Intrinsic semiconductors (5 marks)
 - ii. Extrinsic semiconductors (5 marks)
 - iii. Doping in semiconductors (4 marks)
4. a. With illustrations, explain the following in semiconductors
- i. Majority charge carriers' ii. Minority charge carriers (6marks)
 - b. Using well labeled diagrams, explain the formation of a P-N junction (10 marks)
 - c. Explain the effect of adding an external voltage to the P-N junction (4 marks)
5. With the aid of well labeled graphic diagrams explain:
- i. Forward biasing (10 marks)
 - ii. Reverse biasing (10 marks)