



TECHNICAL UNIVERSITY OF

MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF MECHANICAL AND AUTOMOTIVE ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN MARINE ENGINEERING

MARINE INSTRUMENTATION AND CONTROL 2

EMR 2114

END OF SEMESTER EXAMINATION

SERIES: MAY 2016

TIME: Pick HOURS

DATE: Pick Date Select Month Pick Year

Instructions to Candidates

You should have the following for this examination

-*Answer Booklet, examination pass and student ID*

This paper consists of **five** Questions;. Attempt any **THREE** Questions.

Do not write on the question paper.

QUESTION 1

- a) Can a zener diode be used as an ordinary diode? justify your answer? (4 marks)
- b) With the help of a neat diagram, explain the operation of a bridge rectifier? (8 marks)
- c) What is PIV of the diode used for? (2 marks)
- d) What is LED? Give its principle of working? (6 marks)

QUESTION 2

- a) i) Explain the operation of liquid crystal display (LCD)? (6 marks)
- ii) Where are LCDs used? (2 marks)
- b) i) Give the basic structure and working of an SCR? (6 marks)
- ii) Draw and discuss $v-i$ characteristics of an SCR?

QUESTION 3

- a) Draw the 3 configurations in which a transistor may be connected showing battery connection for each? (6 MARKS)
- b) Explain how a zener diode can be used as a voltage regulator? (8 marks)
- c) Describe the operation of a transistor amplifier in CE configuration? (6 marks)

QUESTION 4

- A) Convert to a required base number;
 - Binary number 100101 to octal equivalent
 - Octal number 18 to binary
 - Hexadecimal number 14 to binary
 - Binary 10111 to hexadecimal (12 marks)
- B) ADD the following binary number
 - 0011010 and 0001100
 - 1010010 and 1011101 (4 marks)
- C) Find the 2's complement of
 - 10101
 - 11001 (4 marks)

Question 5

- Draw a logic circuit for $(A + B)C$. And show the truth table.

- Draw a logic circuit for $A + BC + D$. And show the truth table.