



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

**UNIVERSITY EXAMINATION FOR:**

DIPLOMA DAE 06

EAU 2308: AUTO-ELECTRICAL TECHNOLOGY II

END OF SEMESTER EXAMINATION

**SERIES:** APRIL 2016

**TIME:** 2 HOURS

**DATE:** Pick Date May 2016

## 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.**

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Q.1

- a) List **THREE** sources of heat that can be removed by HVAC system in a vehicle (3mks)
  
- b) Explain **FOUR** components of a vehicle heating and air conditioning system (8mks)
  
- c) With the aid of a well labeled diagram explain the working principle of an air conditioning unit in a vehicle (4mks)
  
- d) Name **TWO** types of automatic air conditioning sensors (2mks)
  
- e) Using a diagram briefly explain the effect of the refrigerants used on automobiles air conditioning system on the environment (3mks)

## Q.2

- a) Explain the importance of vehicle auxiliary gauges (2mk)
- b) Name and explain the work of FIVE gauges used in vehicles (10mks)
- c) Explain FOUR safety gadgets used in vehicles (8mks)

## Q.3

- a) Explain the importance of cable sizing in auto electrical components (3mks)
- b) Explain FIVE properties in which auto electrical cables can be specified (10mks)
- c) List THREE factors to consider when selecting cables for automobile use (3mks)
- d) Discuss the materials used in automotive cables (4mks)

## Q.4

- a) Explain THREE basic components of a vehicle audio system (6mks)
- b) Explain the function of an equalizer in a car audio system and state THREE types of equalizers (5mks)
- c) Explain the difference between the following types of radios used in car audio system
  - i. internet radio
  - ii. satellite radio
  - iii. HD radio (6mks)
- d) Discuss active and passive crossovers as used in vehicle audio systems (3mks)

Q.5

a) With the aid of a diagram show FIVE components of a lead acid battery used in automobiles (10mks)

b) Explain the reactions taking place in a vehicle battery during

i. Charging

ii. Discharging (6mks)

c) State FOUR signs that indicate failure of the battery in a vehicle (4mks)