TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology in Conjunction with Kenya Institute of Highways and Building & Technology (KIHBT)

DEPARTMENT OF ELECTRICAL & ELECTRONIC ENGINEERING

HIGHER DIPLOMA IN TECHNOLOGY

EEE 3101: CREATIVE ENGINEERING

END OF SEMESTER EXAMINATION
SERIES: MAY 2015
TIME ALLOWED: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Answer any **THREE** questions
This paper consists of **TWO** printed pages

Question One

a) (i) Define the term "creative thinking"

(ii) Distinguish between creating thinking and problem solving, citing FOUR distinctive features. **(10 marks)**

b) (i) Explain any THREE requirements in creative thinking.
(ii) Explain TWO application areas of creative thinking **(10 marks)**

Question Two

a) (i) Explain the problem identification stage in design process.

(ii) Distinguish between research and brainstorming.

(iii) Explain any THREE factors to be considered at the research stage of design **(12 marks)**

b) (i) Explain the term 'prototype' and explain the need for a prototype
(ii) Differentiate between innovation and invention **(8 marks)**

Question Three

a) Explain any THREE factors to be considered in each of the following design stages:
(i) Analysis
(ii) Selection of suitable solution **(12 marks)**

b) Describe the process of soldering **(8 marks)**

Question Four

a) Explain any FOUR factors to be considered in hardware implementation. **(8 marks)**

b) Explain any FOUR factors to be considered in software implementation **(8 marks)**

c) With reference to a microcontroller based project explain the hardware and software integration **(4 marks)**

Question Five

a) (i) Explain the term "testing"
(ii) Explain THREE needs for testing **(8 marks)**

b) Explain any THREE types of tests giving ONE advantage and ONE disadvantage for each case **(12 marks)**