



# TECHNICAL UNIVERSITY OF MOMBASA

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Engineering

Electrical Department

## UNIVERSITY EXAMINATION FOR:

EEE2110: WORKSHOP PRACTICE 2

## END OF SEMESTER EXAMINATION

**SERIES: MAY 2016**

**TIME: 2 HOURS**

**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; Question ONE is compulsory. In addition attempt any Other **TWO** Questions.

**Do not write on the question paper.**

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### Question ONE (Compulsory 30 marks)

#### Compulsory 30marks

Qn1(a) Sketch electrical symbols for the following installation equipments

(i) Distribution board **(2mks)**

(ii) Consumer Control Unit **(2mks)**

(iii) Socket out let **(2mks)**

(iv) Two way switch **(2mks)**

(vi) Intermediate switch **(2mks)**

(b) Draw the circuit diagrams for the following;

(i) Two lamps controlled by 2 one way switches fed through consumer control unit **(3mks)**

(ii) Four lamps controlled by 2 two way switches fed through consumer control unit. **(3mks)**

(iii) Three lamps controlled by 2 two way switches and an intermediate switch fed through the consumer control unit **(3mks)**

(iv) Two lamps controlled from more than three positions **(3mks)**

(c) (i) Define a final sub circuit and explain the difference between a point and a final sub circuit.

(ii) State EEE regulations 27(a)(i) governing final sub circuits and their significance in electrical installation work.

(iii) With aid of a sketch illustrate 3 different methods of connecting distribution fuse boards **(8mks)**

## **Question TWO**

Qn2(a)(i) Explain the main purpose of testing an installation and state FOUR factors which an installation need to be protected from **(6mks)**

(ii) Describe the main purpose of verification of polarity test and with aid of a circuit diagram explain how the test is done and results expected **(4mks)**

(iii) With aid of a circuit diagram describe insulation resistance test on a complete installation **(5mks)**

(b) (i) Describe Tinning and plating as used in industrial production **(2mks)**

(ii) Explain the process of assembling a simple transistor radio using a bread board **(3mks)**

## **Question THREE**

Qn3 (a) (i) With aid of describe the construction of a high breaking capacity fuse **(4mks)**

(ii) Describe miniature circuit breaker and state TWO of its advantages **(4mks)**

(iii) Explain the term “lack of discrimination” as used in re-wirable fuse. **(2mks)**

(b) State regulation IEE A10 which governs all sub circuits on fuse rating for final sub circuit and state TWO exceptions to this rule. **3mks**

(c) An installation is to be done on PVC sheathed system consisting of the following final sub circuits.

- 4 lighting points controlled by 2 two way switches and an intermediate switch
- A fluorescent fitting
- 3 socket outlets wired in ring main

(i) List the materials and accessories required for this installation **(1mks)**

(ii) Draw the circuit diagram for this installation **(3mks)**

(iii) Explain steps to be carried out to complete the installation **(3mks)**

## Question FOUR

Qn4 (a)(i) State the FIVE types of final sub circuits **(3mks)**

(ii) Explain why circuit fuses must not exceed the rating of the smallest flexible cord in the circuit **(2mks)**

(iii) A cooker is rated at 12KW and supplied from 240V. Find the rating of the circuit cable for this cooker **(3mks)**

(b) Explain the following terms used in connection with fuse

(i) Current rating

(ii) Fusing current

(iii) Fusing factor **(6mks)**

(c) An installation is to be carried out using PVC class B conduit system. It consists of the following final sub circuits.

- A cooker control unit circuit
- A lighting circuit made of 4 Lamps. The lamps are controlled by three two way switches X, Y AND Z. Switch Y acts as a slave of switch X and Z and one position it switches lamps 1 and 2 and at the other position it switches lamps 3 and 4

(i) List the material and accessories required for the installation

(ii) Draw the circuit diagram for this installation

(iii) Describe how the installation can be carried out **(8mks)**

## Question FIVE

Qn2 (a) Describe the following wiring systems stating their application, advantages, disadvantages and any three accessories used with the system.

(i) PVC (polyvinyl chloride sheathed) cable

(ii) Flexible conduit **(3mks)**

(iii) Steel class B conduit**(3mks)**

(iv) PVC class B conduit **(4mks)**

(b) An installation is to consist of three lamps controlled by two way switches and a one way switch. The one way switch is to act as a master switch. Four socket outlets three connected in ring and the fourth a spur all done in steel class B conduit system

(i) List the material required **(2mks)**

(ii) Draw the circuit of the system **(3mks)**

(iii) Describe how you will carry out the installation **(3mks)**

(iv) State TWO tests that can be carried out on the complete installation before its powered **(1mks)**