



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MEDICAL ENGINEERING

**UNIVERSITY EXAMINATION FOR:**

DIPLOMA IN MEDICAL ENGINEERING (DME 115)

**EEP 2151: ELECTRICAL INSTALLATION II**

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2016**

**TIME: 2 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 four questions. Attempt question ONE (Compulsory) and any other TWO questions.

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

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## Question ONE

(a) State the IEE Regulations requirements with regard to mounting height for

- (i) switches
- (ii) socket-outlets.

**(2 marks)**

(b) Describe the terms

- (i) surface wiring
- (ii) concealed wiring.

**(4 marks)**

(c) A diffusing spherical light fitting is suspended so that its centre is 2.5m above the

working plane. If the fitting emits 8000 lumens uniformly in all directions, calculate the intensity of illumination on the working plane. **(4 marks)**

(d) With the aid of a labelled wiring diagram, show how three lamps can be controlled using two, one-way switches and an intermediate switch. Include fuse rating and conductor size. **(10 marks)**

(e) Explain how

(i) installation flexibility

(ii) maintainability

are factors to be considered during installation design.

**(10 marks)**

### Question TWO

(a) Distinguish between **maintained and non-maintained** emergency lighting systems. **(2 marks)**

(b) An incandescent lamp is suspended 3m above a level workbench and is fitted with a reflector such that the luminous intensity in all directions below the horizontal is 400 candela. Calculate

(i) the illuminance at point A on the surface of the bench immediately below the lamp

(ii) the illuminance at point B, 4m away from A.

**(7 marks)**

(c) Describe the following lighting features

(i) dimming

(ii) flood lighting

(iii) spot lighting

(iv) flashing.

**(11marks)**

### Question THREE

With the aid of a labelled diagram, explain the principle of operation of a closed-circuit-type fire-alarm system. **(20 marks)**

### Question FOUR

Explain the most suitable wiring system to be used in

- (i) environment with highly-explosive vapours
- (ii) extremely-hot working conditions
- (iii) freezing surroundings
- (iv) dusty atmospheres.

**(20 marks)**

**Question FIVE**

(a) Compare and contrast **inspection** and **testing**. **(2 marks)**

(b) State any **THREE** visual checks to be carried out on a lighting circuit. **(3 marks)**

(c) Explain the importance of performing the following tests

- (i) polarity
  - (ii) continuity
  - (iii) insulation resistance
- on a completed electrical installation

**(15 marks)**