

**ELECTRICAL INSTALLATION TECHNOLOGY  
CMES 109  
MARCH/APRIL 2010 SERIES**

**THE MOMBASA POLYTECHNIC  
UNIVERSITY COLLEGE**

**DEPARTMENT OF MEDICAL ENGINEERING**

**CERTIFICATE IN MEDICAL ENGINEERING**

**END SEMESTER EXAMINATION**

**TIME: 2 HOURS**

**INSTRUCTIONS TO THE CANDIDATE.**

This paper contains FIVE questions.

Attempt Question 1 and any other TWO questions.

Question 1 carries 30 marks. The other FOUR questions carry 20 marks each.

- Q1. (a). Define :”special installation”. (5 marks)
- (b). State
- (i). Why electricity is transmitted at high voltage.

- (ii). THREE causes of electrical accidents.
- (iii). FIVE factors to be considered when selecting wiring systems. (10 marks)

(c). Draw wiring diagrams to show

- (i). Lamp A controlled by two 2-way switches  $S_1$  and  $S_2$ .
- (ii). Lamp B controlled by a 1-way switch  $S_3$  and two 2-way switches  $S_4$  and  $S_5$ . (15 marks)

Q2. (a). State, with reasons, any TWO areas in hospitals which require emergency power suppliers. (6 marks)

(b). For a completed electrical installation, state any TWO aspects to be

- (i) inspected
- (ii) tested. (4 marks)

(c). Explain why a white-coloured room appears brighter than a blue-coloured room of the same size. (4 marks)

(d). Describe how cable size varies with

- (i). voltage rating
- (ii). Current rating (6 marks)

Q3.(a). Define “wiring system”. (5 marks)

(b). Draw wiring diagrams to show FOUR socket-outlets connected in

- (i) radial
- (ii) ring, plus a spur. (15 marks)

Q4.(a). State any FIVE types of each electrodes. (5 marks)

(b). Describe the following parts of a lightning arrestor system

- (i) Air termination

(ii). Downconductor

(iii). Test-joint

(iv) Earth electrode

(15 marks)

Q5(a). State any FIVE types of wiring systems.

(5 marks)

(b). With the aid of a labeled diagram, describe THREE main parts of a cartridge fuse.

(6 marks)

(c). Explain the principle of operation of a

(i) fuse

(ii) circuit-breaker.

(9 marks)

Q1(a) Define “electric Shock”

(5 marks)

(b). Explain the need for call and Alarm circuits in

(i). hospitals

- (ii) domestic houses. (10 marks)
- (c). Draw a wiring diagram to show two lamps controlled from three positions using two 1-way switches and an intermediate switch. (15 marks)
- Q2(a). State any FIVE types of wiring systems. (5 marks)
- (b). With the aid of a labeled diagram, describe THREE main parts of a cartridge fuse. (6 marks)
- (c). Explain the principle of operation of
- (a). a fuse
- (b). a circuit-breaker. (9 marks)
- Q3(a). State any FIVE types of earth electronics (5 marks)
- (b). Describe the following parts of a lightning arrestor system
- (i) Air termination
- (ii) Down conductor
- (iii) Test-joint
- (iv) Earth electrode. (16 marks)
- Q4(a). Define “special installation”. (5 marks)
- (b). Draw wiring diagrams to show four socket outlets connected in
- (i). radial
- (ii) ring, plus and spur. (15 marks)
- Q5(a). State, with reasons, any two areas in hospital which require emergency power supplies. (6 marks)
- (b). For a completed electrical installation, State any TWO aspects to be
- (i) inspected

(ii). Tested. (4 marks)

(c). Explain why a white-coloured room appears brighter than a blue-coloured room of the same size. (4 marks)

(d). Describe how cable size varies with

(i). voltage rating

(ii) current rating (6 marks)