



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SECOND SEMESTER EXAMINATION FOR DIPLOMA IN ELECTRICAL AND
ELECTRONICS ENGINEERING

EED 109: ELECTRICAL INSTALLATION TECHNOLOGY II

DATE: 2/8/2016

TIME: 2:00 – 4:00 PM

INSTRUCTIONS

Section A is compulsory

Answer any two in section B

SECTION A: COMPULSORY QUESTION

1.
 - a) Explain the voltage levels as outlined in the Electric power (Electrical installation works) regulations 2006. (6 marks)
 - b) Draw the BS 3939 electrical symbols for the following:
 - Buzzer
 - Fuse
 - Battery
 - Switched socket outlet
 - Intermediate switch (5 marks)
 - c) With the aid of a diagram, explain the term “Protective multiple earthing” (5 marks)

- d) Define the following terms-
- (i) Space factor (2 marks)
 - (ii) Diversity factor. (2 marks)
- State the space factors for the following
- Conduit
- Trunking
 - Ducts
- (3 marks)
- (e) Two lamps, rated at 240V, 60W and 240V, 100W respectively, are connected in parallel to a 240V supply. Calculate the total current drawn from the supply. (5 marks)
- (f) What would be the rating of the Third Lamp to be connected in parallel with the existing two lamps in (c) above to increase the current drawn from the supply to 1 Ampere? (2 marks)

SECTION B: ANSWER ANY OTHER TWO QUESTIONS

2. a) Define the following terms:
- Accessory
 - Wiring system (4 marks)
- b) List any 4 types of accessories used in Electrical Installation (2 marks)
- (c) i) With the aid of a labeled wiring diagram, show the sequence of control equipment at the consumer's intake point for single phase supply. (3 marks)
- ii) State the IEE regulations governing the sequence of control equipment at the consumers intake point. (2 marks)
- (d) With aid of a diagram, explain Radial and Ring final sub circuits. (2 marks)
- e) A P.V.C insulated and sheathed twin cable is to installed on surface to supply a 240V,12Kw cooker 20 metres away from the main switch. If the cooker control unit incorporates a socket outlet, use table 3M provided to determine the minimum cable size for the installation ,coarse excess current protection is provided. (7 marks)

3. a) Define the following terms:
- i) Earth,
 - ii) earthed,
 - iii) earthed electrode,
 - iv) earth continuity conductor,
 - v) earthing lead (5 marks)
- b) Explain the term 'live metal work' (2 marks)
- c) Highlight the main functions of earthing (3 marks)
- d) Explain the main earthing tests stating the instrument and reading expected (10 marks)
4. a) Explain the purpose of testing and inspection (3 marks)
- b) State the sequence of testing and inspection as recommended in the IEE regulations. (4 marks)
- c) With the aid of a circuit diagram, explain the operation of a current operated earth leakage circuit breakers. (11 marks)
- d) State TWO IEE regulation requirements regarding the use of earth leakage circuit breaker. (2 marks)
5. (a) Define the following terms associated with fuses
- (i) Fuse element
 - (ii) Current rating
 - (iii) Fusing current
 - (iv) Fusing factor (8 marks)
- (b) Given that the fusing factor of a rewirable fuse is 2, and the fusing current is 50A, determine the current rating of the fuse. (2 marks)
- (c) Explain the term discrimination as applied in excess current protection, giving examples. (4 marks)
- (d) Explain any Three types of special wiring systems (6 marks)