



MACHAKOS UNIVERSITY

University Examinations 2017/2018

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

FIRST YEAR SECOND SEMESTER EXAMINATION DIPLOMA IN ELECTRICAL
ENGINEERING

EED 109: ELECTRICAL INSTALLATION TECHNOLOGY II

DATE: 13/12/2017

TIME: 8.30-10.30 AM

INSTRUCTIONS

Answer Question One and Any Other Two Questions

SECTION A: COMPULSORY QUESTION

1.
 - a) State two types of cathodic protection . (2 marks)
 - b) With the aid of a well labelled diagram, explain the sacrificial anode corrosion protection system (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) A water heater is rated at 3KW,240V. It is fed by butyl rubber insulated, single-core enclosed in conduit. The cables operate in ambient temperature of 50⁰ C and are provided with close excess current protection. The distance between the heater position and the 240V,single phase ac distribution board is 28m. Choose a suitable cable to satisfy both the current and volt-drop requirements. Use table 7M provided. (7 marks)

- (f) Describe any three types of special wiring systems (6 marks)

SECTION B: ANSWER ANY OTHER TWO QUESTIONS

2. a) Define the following terms:

- (i) Accessory
(ii) 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 any two IEE regulations governing the sequence of control equipment at the consumers intake point. . (2 marks)

(d) With aid of a labelled diagram, describe Radial and Ring final sub circuits (2 marks)

- (e) (i) 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)

- (ii) What would be the rating of the Third Lamp to be connected in parallel with the existing two lamps in (e) above to increase the current drawn from the supply to 1 Ampere? (2 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 is as used in earthing. (2 marks)
- c) State any two 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 of an installation 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 breaker (11 marks)
- d) State TWO IEE regulation requirements regarding the use of earth leakage circuit breakers (2 marks)
5. a) Define the following terms with reference to fuses
- (i) Fuse element
 - (ii) Current rating
 - (iii) Fusing current
 - (iv) Fusing factor (8 marks)
- b) Given the fusing current of a rewirable fuse as 30A, and the fusing factor as 1.5, 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) Describe any Three types of protective enclosures for electrical apparatus. (6 marks)