



MACHAKOS UNIVERSITY

University Examinations for 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SECOND YEAR FIRST SEMESTER EXAMINATION FOR DIPLOMA IN

ELECTRICAL AND ELECTRONICS ENGINEERING

EED 202: ELECTRICAL PRINCIPLES III

DATE: 30/5/2017

TIME: 2:00 – 4:00 PM

INSTRUCTIONS

Answer Question One and Any Other Two Questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- (a) Draw and label all parts of high pressure vapour lamp. (10 marks)
- (b) Define the following terms
 - i) candela
 - ii) luminance.
 - iii) luminous intensity
 - iv) illumination
 - v) luminous exitance (5 marks)
- (c) a lamp giving out 1200 lumens in all directions is suspended 8 meters above the working plane. Calculate the illumination at a point on the working plane 6 meters away from the foot of the lamp. (15 marks)

QUESTION TWO (20 MARKS)

An area 200 x 45 m is to be illuminated by projector lamps, 1000w each, to an illumination level of 10 lumens per square meter. Assuming a beam factor of 0.46, maintenance factor of 0.7 waste factor of 0.2 and lamp efficiency of 18 lumens per watt. Find the number of lamps required.

(20 marks)

QUESTION THREE (20 MARKS)

- (a) Discuss three essential requirements of a good lighting scheme (6 marks)
- (b) Give the functions of the choke and the starter in fluorescent lamps. (4 marks)
- (c) Design a suitable lighting scheme for a factory 120m x 40m with a height of 7m . illumination required is 60 lux .state the number of locations and mounting height of 40watts fluorescent tubes giving 45 lumens /watt.

Depreciation factor = 1.2 and utilization factor = 0.5 (10 marks)

QUESTION FOUR (20 MARKS)

- (a) With an aid of a diagram, discuss three types of transmission of light. (12 marks)
- (b) Explain inverse square law and cosine law as used in illumination. (8 marks)

QUESTION FIVE (20 MARKS)

A road 12 m wide is lighted by lamps giving uniform power in all directions. the lamps are placed at spacing of 48 meters along the sides of the road. The mounting height is 6 meters. Find the minimum illumination in the middle of the road when lamps are placed on both sides of the road, opposite to each other and the illumination on the road midway between opposite lamps is 8 lux.