



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 CERTIFICATE IN ELECTRICAL AND
ELECTRONICS ENGINEERING**

EPC 202: ELECTRICAL PRINCIPLES III

DATE: 3/8/2016

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

Answer Que

stion One And Any Other Two Quistions

QUESTION ONE (COMPULSORY) (30 MARKS)

- (a) With an aid of a diagram discuss two types of transmission of light (10 marks)
- (b) Define the following terms
 - i) candela
 - ii) luminous flux
 - 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

A foot ball pitch 120mx60m is to be illuminated for night play by similar banks of equal 1000w lamps supported on 12 towers which are distributed around the ground to provide approximately uniform illumination of the pitch. Assuming that 40% of the total light emitted reaches the playing pitch and that an illumination of 1000lm/m² is necessary for television purposes, calculate the number of lamps on each tower. The overall efficiency of the lamp is 30lm/w. (20 marks)

QUESTION THREE

Design a suitable lighting scheme for a factory 120mx40m with a height of 7m. illumination required is 60 lux. state the number of locations and mounting height of 40watts fluorescent tubes giving 45lumens /watt.

Depreciation factor = 1.2 and utilization factor = 0.5 (20 marks)

QUESTION FOUR

- (a) With an aid of well labeled diagram, explain the operation of a fluorescent bulb (12marks)
- (b) Explain inverse square law and cosine law as used in illumination. (8 marks)

QUESTION FIVE

Design a suitable lighting scheme for a factory 120mx40m with a height of 7m. illumination required is 60 lux. state the number of locations and mounting height of 40watts fluorescent tubes giving 45lumens /watt.

Depreciation factor = 1.2 and utilization factor = 0.5 (20 marks)