



MACHAKOS UNIVERSITY

University Examination 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SECOND YEAR SECOND SEMESTER EXAMINATION FOR

CERTIFICATE IN ELECTRICAL AND ELECTRONIC ENGINEERING

EPC 218: ELECTRICAL DESIGN ESTIMATING AND TENDERING

DATE: 7/5/2019

TIME: 8.30-10.30 AM

INSTRUCTIONS:

This paper consist two sections A and B

Answer Question ONE and Any Other TWO Question in section B

SECTION A

QUESTION ONE (30 MARKS)

- a) Define the following terms
- i. Candela
 - ii. Luminous flux
 - iii. Lumen hour
 - iv. Utilization factor
 - v. Maintenance factor (10 marks)
- b) State and derive the lamberts cosine law (6 marks)
- c) With aid of diagram, explain the following lighting scheme terms as used in luminaires
- i. Direct
 - ii. Semi direct
 - iii. Semi indirect (9 marks)
- d) State two factors that influence the demand for
- i. Labour
 - ii. Capital (5 marks)

SECTION B

QUESTION TWO (20 MARKS)

- a) Explain four factors to be considered when designing a wiring system (10 marks)
- b) Define the following terms
 - i. Tort
 - ii. Contract
 - iii. Crime (6 marks)
- c) Explain two instances when a contract can be terminated (4 marks)

QUESTION THREE (20 MARKS)

- a) A corridor is lit by 4 lamps spaced 10m apart and suspended at a height of 5M above the centre line of the floor. If each lamp gives 200candela in all direction below the horizontal find the illumination at the point on the floor midway between the second and third lamps (14 marks)
- b) explain the following requirement for a validity of a contract
 - i. Offer and acceptance
 - ii. Capacity
 - iii. Consideration (6 marks)

QUESTION FOUR (20 MARKS)

- a) A room 8m by 12m is lit by 15 lamps to a fairly uniform illumination of $100\text{lumen}/\text{m}^2$. Calculate the utilization coefficient of the room given that the output of each lamp is 1600 lumens. (6 marks)
- b) A drawing hall in an engineering college is to be provided with a lighting installation, the hall is $30\text{m} \times 20\text{m} \times 8\text{m}$ high. The mounting height is 5m and the required level of illumination is $144\text{lm}/\text{m}^2$.
Using metal filament lamps estimate the size and number of single luminaries and also draw their spacing layout
Assume
Utilization coefficient = 0.6
Maintenance factor = 0.75

Space height ratio = 1

Lumens/watts for 300w lamp=13

Lumens/watts for 500w lamp =16

(14 marks)

Q5.define the following terms

Tender

Estimation

(6 marks)

c) briefly explain four types of contract

(14 marks)