



TECHNICAL UNIVERSITY OF MOMBASA

School of Engineering and Technology

Department of Electrical and Electronic engineering

Diploma in Electrical Power Engineering

***ILLUMINATION
EEP 2306***

**SERIES: MAY 2025
TIME: 2 HOURS**

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

Answer any THREE of the FIVE questions.

Do not write on the question paper.

Question ONE

- (a) (i). State the CONSINE LAW of illumination. (4marks)
(ii). Explain the STROBOSCOPIC EFFECT for discharge lamps. (5 marks)
- (b) A living room 8m long and 5m wide is to be illuminated with 100W tungsten filament lamps to 120 lm/m. The lamps have a efficiency of 12 lm/w. The coefficient of utilization is 0.7 and the maintenance factor is 0.75. How many 100w lamps will be required? (11 marks)

Question TWO

- (a) Define:
- (i). Shadow
 - (ii). Lux
 - (iii). Depreciation factor
 - (iv). Luminous flux
- (4marks)
- (b) A yard 25M long by 6M wide is to be illuminated to a level of 2lm/m. Assuming the average lumen output of lamp is 35lm/W the maintenance factor 0.8 and the coefficient of utilization 0.5 Calculate the total lamp power required and the number of lamps to be used. (12 marks)
- (c) List the names of the filament materials since the invention of incandescent lamp. (4 marks)

Question THREE

- (a) (i) Explain how a discharged lamp works.
(ii). State the disadvantages of single coil filament in a lamp over the coiled coil filament. (6 marks)
- (b) State the efficiency of the following:
- (i). Tungsten filament lamp
 - (ii). Tungsten filament lamp with argon gas
- (2 marks)
- (c) Define the following terms:
- (i). Glare
 - (ii). Flicker
 - (iii). Maintenance factor
 - (iv). Luminous intensity
 - (v). Depreciation factor
- (5 marks)
- (d). State THREE factors affecting the value of utilization factor. (3 marks)
- (e) Define the following:
- (i). Semi direct lighting systems
 - (ii). Semi indirect lighting system
- (4 marks)

QuestionFOUR

- (a) Draw a diagram of a metal halide lamp and explain how it works. (4 marks)
- (b) Define a luminaire. (2 marks)
- (c) State the requirements in the design of a lighting scheme. (4 marks)
- (d) A lamp having a luminous intensity of 720 cd is fixed 6M above a working plane Calculate the illumination:
- (i). At point A vertically below the lamp
 - (ii). At a point B 6m from point A on the same horizontal plane
- (10 marks)

Question FIVE

(a) Define:

- (i). Illumination
- (ii). Brightness
- (iii). Reflection factor
- (iv). Diffusing lighting

(6 marks)

(b) Explain why indirect lighting is most preferred to most other lighting systems in a professional design.

(4 marks)

(c) State where the following lamps are mostly applied and why:

- (i). Neon lamps.
- (ii). Low pressure sodium lamps

(2 marks)

d) (i) State the methods of removing stroboscopic effect in discharge lamps.

(ii). Explain what is meant by an incident light.

(6 marks)