TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

Department of Electrical and Electronic engineering

Diploma in Electrical Power Engineering

ILLUMINATION
EEP 2306

SERIES: APRIL/MAY 2019
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) Define:

(i). lumen

(ii). Lux

(iii). Depreciation factor

(iv). Luminous flux

(8 marks)

(b) The front of a building 35 × 18 m is illuminated by 15 lamps; the wattage of each lamp is 80 W. The lamps are arranged so that uniform illumination on the surface is obtained. Assuming a luminous efficiency of 20 lumens/W, the coefficient of utilization is 0.8, the waste light factor is 1.25, DF = 0.9. Determine the illumination on the surface.

(12marks)

Question TWO

(a) State the Two laws of illumination (4 marks)

(b) Explain the STROBOSCOPIC EFFECT for discharge lamps. (4 marks)

(c) A living room 8m long and 5m wide is to be illuminated with 100W tungsten filament Lamps to the level of 120 lm/m^2. The lamps have a efficiency of l2 lm/w. The coefficient of utilization is 0.7 and the maintenance factor is *0.75.* Flow many 100w lamps will be required? (12 marks)

Question THREE

(a) Define:

(i). Illumination

(ii). Brightness

(iii). Reflection factor

(iv). Diffusing lighting

(8 marks)

(b) A pathway is illuminated by two lamps A and B having a luminous intensity of 200 candelas and 250 candelas mounted on lamp post at a height of 8M and 10M respectively. The lampposts are erected 40M along the pathway.
Determine the illumination on the pathway half way between the two posts.

(12 marks)

QuestionFOUR

(a) State FOUR lighting schemes. (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 the following terms:
(i). Glare
(ii). Maintenance factor
(iii). Space height ratio
(iv). Utilisation factor
(8 marks)
(b). State THREE factors affecting the value of utilization factor. (3 marks)
(c) Explain the following:
(i). Semi direct lighting systems
(ii). Semi indirect lighting system
(iii) Polar curves
(iv) colour rendering
(v) cavity reflectance
(9 marks)