



SLIATE

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION

(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Building Service Engineering.

2nd Year, Second Semester Examination – 2016

BSE2206- Building Lighting Systems

Instructions for Candidates:

Answer any **four (4)** questions.

All questions carry equal marks.

No. of questions : 05

No. of pages : 03

Time : 02 Hours

1.

- I. State the two laws of illumination *(06 marks)*
- II. What is the value of wavelength and frequency of visible light *(04 marks)*
- III. What is the commonly used units to measure wavelength *(03 marks)*
- IV. Define the following terms used in illumination
 - a. Reflection factor
 - b. Depreciation factor
 - c. Absorption factor
 - d. Mean hemispherical spherical candle power *(12 marks)*

[Total 25 marks]

2.

- I. What is meant by illumination? *(02 marks)*
- II. Two street lamp posts that are 25m high are situated in a road 80m apart. Lamp 'A' emits 1400 candle power and Lamp 'B' emits 1200 candle power. The midway point is 'C'
 - a. Draw a diagram for the above situation. *(03 marks)*
 - b. What is the illumination at point 'C'? *(10 marks)*

- e. Show with calculation whether, illumination under lamp A or illumination under lamp B is greater. (10 marks)

[Total 25 marks]

3.

- I. What is known as space height ratio? (02 marks)
- II. State suitable values for space height ratio when designing a lighting system for a building. (02 marks)
- III. A lighting scheme is required to be made for an industry building of length, width and height of 30m x 12m x 6m respectively. Lights are hung 2m below the ceiling and working benches are 1.5 m tall. Minimum of 250 lux is required at the working benches and you are to use 80w, light emitting diode point light sources with 72 lumens/watt efficiency. Under working conditions the depreciation factor is 0.75 and the absorption factor is 0.9 in the room.
- a. Calculate the minimum amount of lamps required to light the room with above conditions. (06 marks)
- b. Design a suitable lighting arrangement for the above building by providing calculations and a detailed diagram. (15 marks)

[Total 25 marks]

4.

- I. Explain the construction and working principle of a 'Fluorescence lamp'. (05 marks)
- II. "Fluorescence blubs can be replaced by LED blubs for efficient power consumption" explain the above statement with necessary details. (05 marks)
- III. Draw and name the 'Cornea', 'Retina', 'Iris' and 'Pupils' of a human eye. (12 marks)
- IV. What are the factors to be considered when selecting flood lights to a venue? (03 marks)

[Total 25 marks]

- 5.
- I. Explain the following terms in illumination *(06 marks)*
 - a. Glare
 - b. Color rendering index
 - c. Light power density
 - II. What is meant daylight factor? *(03 marks)*
 - III. State three ways to improve the daylight factor *(06 marks)*
 - IV. What is meant by colour temperature in illumination? *(02 marks)*
 - V. What is the colour temperature of day light? *(02 marks)*
 - VI. What is meant by 'diffusion' in illumination? *(02 marks)*
 - VII. What is the use of diffusion when installing a light source? *(04 marks)*

[Total 25 marks]