



# BRAINWARE UNIVERSITY

Term End Examination 2023-2024

Programme – Dip.EE-2021

Course Name – Illumination Engineering

Course Code - DEE507A

( Semester V )

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Brainware University  
Barasat, Kolkata - 700125

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

## Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Memorize a zero watt lamp consumes
- a) No power  
b) About 5 to 7 W power  
c) About 15 to 20 W power  
d) About 25 to 30 W power
- (ii) Predict the capacitor is used in auto transformer circuit of a sodium vapour lamp in order to
- a) Regulate discharge voltage  
b) Improve the circuit power factor  
c) Control lamp illumination level  
d) Protect the lamp against overvoltage
- (iii) Select the initial color of sodium vapour lamp
- a) Red  
b) Pink  
c) Yellow  
d) Blue
- (iv) Express the luminous efficacy of high-pressure mercury vapour lamps ranges from .....lumens/watt
- a) 30 to 40  
b) 70 to 90  
c) 100 to 120  
d) 150 to 180
- (v) Choose from the following is present inside the fluorescent tube
- a) Helium and oxygen  
b) Argon and carbon dioxide  
c) Argon and neon  
d) Mercury vapour
- (vi) Identify the speed of light
- a)  $3 \times 10^{10}$ cm/s  
b)  $3 \times 10^{12}$ cm/s  
c)  $3 \times 10^{15}$  cm/s  
d)  $3 \times 10^{18}$  cm/s
- (vii) Recognize most affected parameter of a filament lamp due to voltage change
- a) Wattage  
b) Life  
c) Luminous efficiency  
d) Light output
- (viii) Predict the life of the incandescent lamp is expected to be

- a) 100 Hours  
c) 1000 Hours
- (ix) Select which of the following lamp gives nearly ultra-violet light  
a) Vacuum type filament lamp  
c) Argon filled filament lamp
- (x) Identify the luminous efficacy of a fluorescent tube  
a) 5- 10 lumens/watt  
c) 30 - 40 lumens/watt
- (xi) Determine from the following vapors/gas will give yellow color in a filament lamp?  
a) Helium  
c) Sodium
- (xii) Predict the ratio of illuminance at a point 5m just below a lamp emitting 100 candelas and at a point 5m away from the first point on the same horizontal plane?  
a) 1:2  
c) 1: 2.828
- (xiii) Select ionization potential of sodium vapor lamps  
a) 5 volts  
c) 100 volts
- (xiv) Identify radiant efficiency of the luminous source depends on  
a) shape of the source  
c) wavelength of light rays
- (xv) Identify the photometer which is used for comparing the light of different colors  
a) Bunsen photometer  
c) Lummer Brodhum Photometer
- b) 200 Hours  
d) 10000 Hours
- b) Nitrogen filed filament lamp  
d) Carbon arc lamp
- b) 15-20 lumens/watt  
d) 60 - 65 lumens/watt.
- b) Mercury  
d) Magnesium
- b) 50 volts  
d) 112 volts
- b) temperature of the source  
d) all of the above.
- b) Grease spot Photometer  
d) Guilds Flicker Photometer

### Group-B

(Short Answer Type Questions)

3 x 5=15

2. Determine how can color temperature selection impact the mood and atmosphere in outdoor hospitality spaces, such as restaurants and cafes? (3)
3. Explain polar curves (3)
4. Identify the following : i) Glare, ii) MHCP, (3)
5. Explain how does a halogen lamp differ from a standard incandescent lamp? (3)
6. Write the operations of the following with circuit diagram : sodium vapor lamp (3)

OR

Analyze after finding a relation between plain angle and solid angle.

(3)

### Group-C

(Long Answer Type Questions)

5 x 6=30

7. Define Maintenance factor and depreciation factor (5)
8. tell that in a filament lamp, the diameter of filament is directly proportional to  $I^{2/3}$ , where I is the current flowing in the filament (5)
9. Explain about the application of colorimetry? (5)
10. Compare different lighting scheme in brief. (5)
11. Represent the laws of illumination. (5)
12. You are a lighting designer for a museum. How would you examine the effectiveness of the lighting design for an exhibit, and what criteria would you use to assess its success? (5)

OR

Discuss the use of daylight harvesting and occupancy sensors to minimize energy consumption. How will you interpret LED lighting to maximize efficiency while maintaining a luxurious ambiance?

(5)

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