



# ARE 325 : Building Illumination

## Assignment 1: PART A, Fundamentals

**Course** : Building Illumination, ARE 325 (1-3-2)  
**Semester** : 2006-2  
**Instructor** : Dr. Adel A. Abdou  
 Bldg.: 19, Room: 327, Tel.: 860-2762, Office Hours: as posted

**Student Name :** \_\_\_\_\_ **I.D. :** \_\_\_\_\_

**1. What is the goal of Architectural Lighting (Building Illumination)? (See page 47, your textbook)**

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\_\_\_\_\_

**2. Define the following terms:**

#	Term	Definition / Explanation
1	Good Visual Environment	
2	Light	
3	Visual Noise	
4	Visual Perception	
5	Mention the factors that affect our visual perception of images/objects:	a. _____ b. _____ c. _____ d. _____



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#	Term	Definition / Explanation
6	What are the three components of our perceptual abilities? Explain each component?	a. _____ b. _____ c. _____
7	Explain each component?	a. _____ b. _____ c. _____

## 2. Define the following Lighting Quantities or Units

#	Quantity		Symbol	Unit (SI)
1	Luminous Intensity			
2	Candela			
3	Luminous Flux			
4	Illuminance			
5	Lx, Lux			
6	Luminance			



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#	Quantity		Symbol	Unit (SI)
7	Luminous Exitance			
8	Apparent (perceived) Brightness			
9	Mention the factors that affect our perception of Apparent Brightness:	a. _____ b. _____ c. _____		
10	Light Reflectance			
11	Light Transmittance			

### Calculation Problem

A total of **4000-lux** is measured on one-side of a (2.0 m x 1.5 m) reflective glass panel. The glass has a reflectance of **0.25** and an absorbance of **0.05**. Calculate the total lumens **transmitted** from the glass panel?

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5. What is meant by visual efficiency?

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6. How well we see depends on many factors such as:

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7. Explain your understanding of the following terms and mention the factors affecting each.

● Visual task

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● Visual Ability

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● Object Visibility

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8.a Define Glare:

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8.b Explain *Discomfort* glare and *Disability* glare; Mention the factors that affect each type.

<i>Discomfort Glare</i>	<i>Disability Glare</i>
<hr/> <hr/> <hr/>	<hr/> <hr/> <hr/>
Factors: <hr/> <hr/>	Factors: <hr/> <hr/>

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8.c Mention the factors that affect visual comfort limits for glare:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

9.a What are veiling reflections? When do they occur?

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9.b How can veiling reflections occurrence be reduced?

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

10. Visual task performance involves three processes, which are:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

11.a What is contrast?

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11.b Why is it useful?

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12. What does IESNA stand for?

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## Assignment 1: PART D, Basics

**Course** : Building Illumination, ARE 325 (1-3-2)  
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**Student Name :** \_\_\_\_\_

**I.D. :** \_\_\_\_\_

- (T)rue /(F)alse: mark (, X):

1. [ ] Apparent (perceived) brightness is modified by surroundings and condition of the eye adaptation and other factors.
2. [ ] Apparent brightness is not affected by the eye adaptation.
3. [ ] Both perceived brightness and measured brightness are affected by the reflectance of materials.
4. [ ] Brightness perception is normally within a range of 1 to 1000  $FL$  (3-3450  $cd/m^2$ )
5. [ ] Discomfort glare and disability glare can be both caused by direct or reflected glare.
6. [ ] Increasing the object size, or increasing the viewing angle, and providing high-quality lighting improve visibility.
7. [ ] Light transmitted through glass varies with the angle of incidence. Transmission decreases as the angle of incidence increases.
8. [ ] The greater the angle between the source of glare and the horizontal line of sight, the less the discomfort glare.
9. [ ] The human eye is more sensitive to contrast at high brightness levels than at low levels.
10. [ ] The illuminance from a point source on a surface increases inversely with the square of the distance between the source and the surface.
11. [ ] Vision with one eye is called binocular vision while vision with two eyes is monocular vision.
12. [ ] Visual acuity improves with increasing the duration of exposure (time for seeing).
13. [ ] The non-visible portion of the electromagnetic spectrum can affect us.

*Best Wishes*