

Arch 464
ECS
Midterm I
Spring 2017

30 Multiple Choice Questions

BALDO/ by Cantu and Castellanos



1. What's "the best text book in the universe"?
 - A. Sun Wind and Light
 - B. The Green Studio Handbook
 - C. MEEB
 - D. Heating Cooling and Lighting
2. The Managua Cathedral by Legoretta in Nicaragua adapts to its climate and lighting environment
 - A. by having skylights high in the space
 - B. by using operable apertures to adjust the daylighting
 - C. by providing apertures on at least two surfaces
 - D. by placing intense tasks near the windows
3. Mario Botta used a giant oculus in SF MOMA to shape the flow of light into the stair tower. Snøhetta Architects modified the design to
 - A. eliminate the oculus
 - B. add shading to the oculus
 - C. reroute the circulation into the new addition
 - D. none of the above

4. Architects and designers have the most control over lighting
- A. senders
 - B. interveners
 - C. receivers
 - D. perceivers
5. Diffuse light in an interior space is most effectively reflected in
- A. the sculpture court in Palladio's Canova Museum
 - B. the mirrored dance studio at the Atlantic Center for the Arts
 - C. the waiting room at Union Station in St. Louis
 - D. Richard Meier's addition to the High Museum in Atlanta
6. Weber's Law is
- A. about quantifying light
 - B. about reflectivity
 - C. about understanding perception
 - D. only applicable to lighting design
7. Subjective measures of lighting include all but
- A. eye sensitivity to visible wavelengths
 - B. light's color temperature
 - C. the sensation of glare
 - D. the perception of natural color
8. Given a light source with luminous intensity of 10 candelas
- A. its luminous flux would be 126 lumens
 - B. the density of its luminous flux at 2 feet is 5 fc
 - C. the luminance of a 50% reflective surface at 2 feet would be 2.5 fl
 - D. all of the above
9. A desirable light source for a daylighted art museum is
- A. the sky component
 - B. the sun component
 - C. the external reflected component from a neighboring reflective glass curtain wall
 - D. all of the above
10. When the solar altitude angle is 45° , the darkest part of the sky is
- A. at the horizon
 - B. at the zenith
 - C. opposite the sun at 45°
 - D. none of the above
11. Imagine two rooms with identical light sources, room A with all surfaces at 60% reflectivity and room B with all surfaces at 20% reflectivity.
- A. Room A is 3 times brighter
 - B. Room A is 6 times brighter
 - C. Room A is 9 times brighter
 - D. Room A is 27 times brighter

12. Age old adages are most helpful in lighting design during

- A. schematic design
- B. design development
- C. digital daylight modeling
- D. all of the above

13. Glare can be mitigated by

- A. apertures in two room surfaces
- B. splayed apertures
- C. high IRCs
- D. all of the above

14. The main difference in the quality of the daylighted atria in Chicago's Rookery and Buffalo's Ellicott Square is

- A. the size of the aperture
- B. the depth of the light well
- C. the IRC
- D. the height of the space

15. The strength of the Graphic Daylight Design Method for predicting daylighting is

- A. the calculation of footcandles
- B. showing the relationship between light and architectural space
- C. photorealistic rendering of space
- D. all of the above

16. The "footprints" used in the Graphic Daylight Design Method (GDDM)

- A. represent light distribution patterns
- B. are keyed to aperture geometry
- C. can be added to find total light levels
- D. all of the above

17. The evolution of computer-based daylight prediction methods includes

- A. numeric output
- B. spline mesh representation of light in space
- C. false color rendering of surface brightness
- D. all of the above

18. If you wanted to determine annual climate-based daylight performance, you'd model your building with

- A. AGi-32
- B. Sefaira
- C. either of the above
- D. none of the above

19. The main reason for using an artificial sky for testing daylighting models is

- A. to eliminate sun from the test model
- B. to test under a consistent sky light distribution
- C. to photograph lighting conditions in the model
- D. an excuse to wear lab coats



20. A reason for creating a daylighted artificial sky is
- A. philosophical—encourage a passive mindset
 - B. qualitative—the quality of natural light
 - C. environmental—a zero-energy alternative
 - D. all of the above

21. Electrical lighting illumination level recommendations were most responsive to the point of diminishing returns for efficient accomplishment of tasks
- A. in 1936
 - B. in 1950
 - C. in 1970
 - D. in 2016



22. Integrating daylighting with electric lighting can
- A. earn LEED credits
 - B. get allowances for higher installed lighting density by code
 - C. provide a more healthy and productive interior environment
 - D. all of the above
23. Extending the life of fluorescent lamps by leaving them on at all times
- A. is true
 - B. is a half truth
 - C. is false in terms of what future date the lamp must be replaced
 - D. none of the above
24. Phosphors have been used to improve the color rendering abilities of
- A. compact fluorescent lamps
 - B. metal halide lamps
 - C. mercury vapor lamps
 - D. all of the above
25. Compared to a fluorescent lamp with a color temperature of 3000°K, one rated at 4200°K
- A. is more energy efficient
 - B. gives off warmer light
 - C. gives off cooler light
 - D. renders colors more accurately

26. LED lamps run on AC electricity save money over CFLs in the long term because
- A. they have a much greater efficacy
 - B. they have a much longer operating life
 - C. they improve worker productivity
 - D. all of the above
27. The most efficient fixture for task lighting is
- A. direct
 - B. direct/indirect
 - C. indirect
 - D. any of the above
28. The most effective fixture for integration with daylighting is
- A. direct
 - B. direct/indirect
 - C. indirect
 - D. any of the above
29. Unfortunately you're designing a big box store, so you'd get the best estimate of light levels from a luminous ceiling
- A. by using the point source calculation method
 - B. by using the line source calculation method
 - C. by using the zonal cavity method
 - D. any of the above
30. Light distribution from a lamp and its fixture is described by
- A. its photometric curve
 - B. its coefficient of utilization
 - C. its lumen output at 40% life
 - D. all of the above

