

Arch 464  
ECS  
Midterm I  
Spring 2012

### 30 Multiple Choice Questions

1. The course textbook featured in a music video is
  - A. Sun Wind and Light
  - B. Mechanical and Electrical Equipment for Buildings
  - C. Heating Cooling and Lighting
  - D. none of the above
2. Effective use of daylighting in buildings can be linked to
  - A. beauty
  - B. improved academic achievement
  - C. stronger retail sales
  - D. all of the above
3. A daylighted building that uses internal/external lightshelves on its south façade could be said to
  - A. take a biological approach
  - B. shape form to guide flow
  - C. consider quality of life
  - D. none of the above
4. Richard Meier's Jubilee Church in Rome is strongly related to
  - A. Alvar Aalto's Riola Church in Italy
  - B. James Gibbs' St. Martins-in-the-Field in London
  - C. Steven Holl's St. Ignatius Chapel in Seattle
  - D. Le Corbusier's Notre Dame du Haut in Ronchamps
5. In daylighting design, glare can best be mitigated with
  - A. specular transmitters and diffuse reflectors
  - B. specular transmitters and specular reflectors
  - C. diffuse transmitters and diffuse reflectors
  - D. diffuse transmitters and specular reflectors
6. A subjective measurement of light is
  - A. its color
  - B. its color temperature
  - C. acceptable appearance of colors
  - D. all of the above



7. If 12.57 lumens falls on the inner surface of a one-foot radius sphere with the light source at its center,
- A. the light source is 1 candela
  - B. the source would illuminate the inner surface of a similar 2-foot radius sphere to 0.25 footcandles
  - C. 12.57 lumens would fall on the surface of a similar sphere with a radius of 3 feet
  - D. all of the above
8. To calculate the daylight factor at a point in a room
- A. divide the interior illuminance by the exterior luminance and multiply by 100
  - B. add the sky, external reflected, and internal reflected components
  - C. divide the interior footcandles by 100
  - D. none of the above
9. A student's desk in an effectively daylighted classroom will receive light from
- A. direct sunlight
  - B. the room's floor cavity
  - C. the room's walls and ceilings
  - D. all of the above
10. In a sunny climate a classroom lighted by a south-facing roof monitor can achieve results similar to one lighted by a north-facing roof monitor if
- A. an internal light shelf is used
  - B. the roof monitor uses bronze translucent glazing
  - C. its roof monitor windows are effectively shaded with external louvres
  - D. none of the above
11. The least effective way to achieve deep penetration of daylight into a space is to provide
- A. clear glazing high in the space
  - B. translucent glazing high in the space
  - C. clear glazing at eye-level
  - D. all of the above are equally effective
12. Glare in a daylighted space can be mitigated by
- A. apertures in two or more surfaces
  - B. splayed apertures and ceilings
  - C. high IRC
  - D. all of the above
13. A north-facing window's lightshelf's most important role in daylighting is to
- A. increase the amount of light in the interior space
  - B. provide more even distribution of light in the interior space
  - C. act as an effective shading device
  - D. all of the above

14. The hand calculation method that doesn't explicitly involve room geometry is
- the LBL nomograph
  - the BRS protractor method
  - the Graphic Daylight Design Method
  - none of the above
15. One of the major advantages that computer models have over hand calculations for daylighting is
- they're more accurate
  - they can simultaneously model daylighting and energy use
  - they can show daylight distribution in the room
  - all of the above
16. The best computer-based daylight prediction program is without doubt
- Ecotect
  - AGI-32
  - LightUp for SketchUp
  - none of the above
17. Physical daylighting models are effective because
- light interacts with the model the same as it interacts with a full scale room
  - they can allow you to photograph alternative designs for side-by-side comparison
  - well-crafted models look like the real full-scale room
  - all of the above
18. The daylighted artificial sky under construction in AAS will be useful in physical model testing because
- it will reproduce the luminance of a cloudy sky
  - it will reproduce the light distribution of a standard cloudy sky
  - it will reproduce the light quality of a cloudy sky
  - all of the above
19. Historically, electric lighting level recommendations were not excessive through
- the 1930s
  - the 1950s
  - the 1970s
  - the 1990s



20. The fact that human performance is less affected by increased lighting at high illumination levels than at low illumination levels probably is due to

- A. cone vs. rod vision
- B. increased color temperature
- C. Weber's Law
- D. all of the above

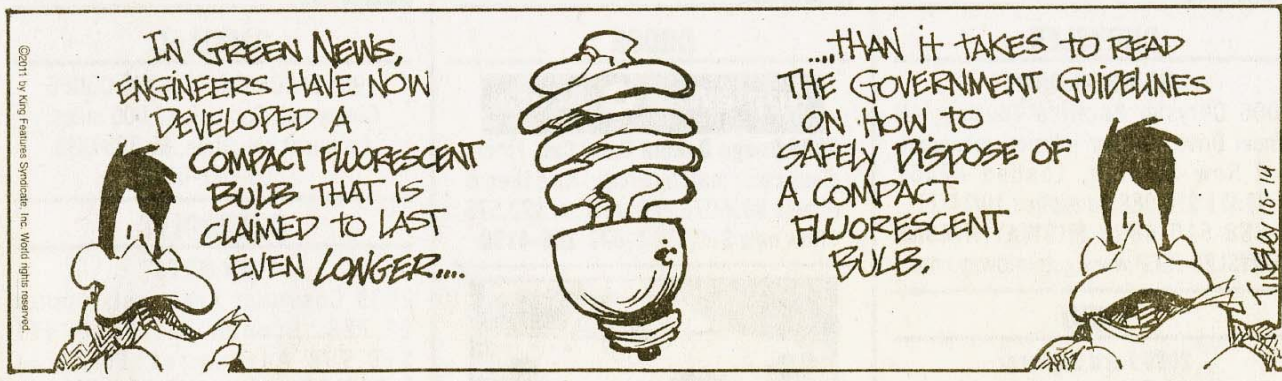
21. Incandescent lamps from 40 to 100 watts will be illegal in Europe and the U.S. by 2014 because

- A. of poor color rendering
- B. extreme inefficiency
- C. socialist governments
- D. all of the above

22. The most energy-efficient lamps that you can buy today are

- A. T-8 fluorescents
- B. compact fluorescent
- C. high pressure sodium
- D. light-emitting diodes

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23. If you turn off a fluorescent lamp in a daylighted exterior office during daylight hours, you can expect it to last (on the average)

- A. for 5 years
- B. for a decade
- C. for 15 years
- D. more than 20 years

24. The efficacy of a lamp describes

- A. its effective color rendering
- B. light delivery in lumens per watt
- C. its energy efficiency in lumens per square foot
- D. none of the above

25. LED lamps are currently about as efficient as CFLs, but can be more efficient

- A. when operated on direct current
- B. as the technology improves in the near future
- C. A & B above
- D. none of the above



26. The 2013 Super Bowl had a power failure and it took about 30 minutes to get the lighting up to full intensity. The lamps were most likely

- A. LEDs
- B. CFLs
- C. HIDs
- D. incandescent

27. The most efficient type of fixture is

- A. indirect
- B. indirect/direct
- C. direct/indirect
- D. direct

28. The most effective fixture type for seamless integration with a daylighting scheme that uses light sensor-controlled dimming is

- A. indirect
- B. indirect/direct
- C. direct/indirect
- D. direct

29. The lumen method is fairly accurate because it considers

- A. the loss of light from a wide variety of operating conditions
- B. the interaction of room surfaces and the fixtures
- C. the interaction of the lamp and fixture
- D. all of the above

30. You've used the point source method to predict the illumination delivered by two sources. One 10 feet away contributes 25 f.c., the other 20 feet away contributes 6 f.c. You are confident that

- A. at least 31 f.c. will illuminate the point
- B. no more than 31 f.c. will illuminate the point
- C. exactly 31 f.c. will illuminate the point
- D. none of the above

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