

Arch 463  
ECS  
Fall 2015

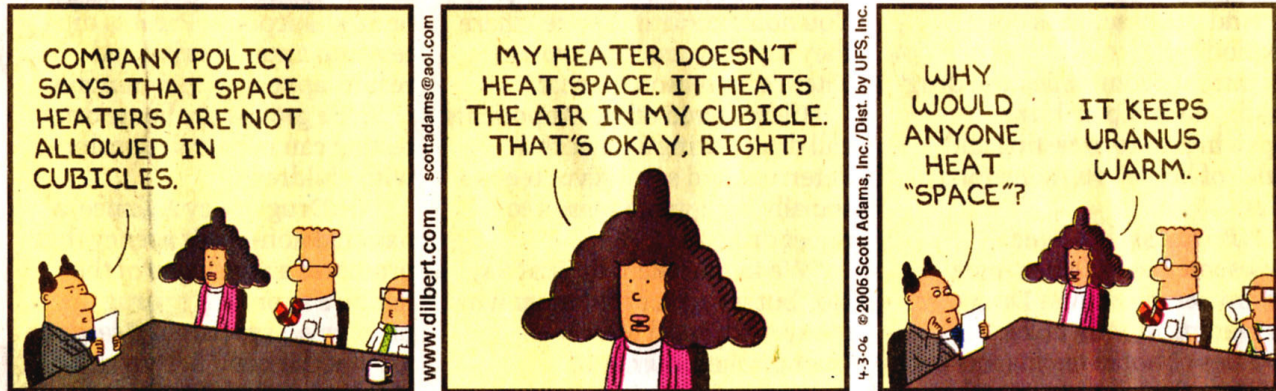
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FINAL

40 Multiple Choice Questions

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### Part 1—Review Questions on material covered in Midterms I & II

1. The north facade of AAN can receive direct sun on sunny days
  - A. all year
  - B. just in the summer
  - C. from March 21 until September 21
  - D. never
  
2. Adaptive comfort theory professes that during the summer in a naturally ventilated building
  - A. occupants will be comfortable at higher temperatures than in winter
  - B. only occupants from hot climates will be comfortable
  - C. the standard comfort zone must be adjusted for clo levels
  - D. none of the above
  
3. A fritted glass external shading device is meant to be
  - A. a barrier to the sun
  - B. a filter of solar radiation
  - C. a connector for solar radiation
  - D. a solar radiation switch

4. In Riggins, ID, which is in the narrow Salmon River Valley, you'd expect nighttime thermal breezes to

- A. flow up-river
- B. flow down-river
- C. be non-existent
- D. always be overpowered by prevailing winds

5. For an office in a high-rise office building you'd expect

- A. the heating season to be shorter than for a residence in the same city
- B. perimeter zones to be solar heated
- C. interior zones to be well-daylighted
- D. all of the above

6. A balance point temperature higher than the outdoor temperature indicates

- A. the building requires heating
- B. the building requires cooling
- C. the building requires economizer cooling
- D. it's an internal load dominated building

7. The most effective passive cooling strategy for ventilation in a climate that has hot arid summers is

- A. stack ventilation
- B. cross ventilation
- C. night ventilation of thermal mass
- D. all of the above

8. Adaptive comfort standards are applicable to

- A. buildings built to Passive House standards
- B. air-conditioned buildings
- C. naturally ventilated buildings
- D. all of the above

9. My office in AAS has east-facing, single-pane windows with a great view of the admin lawn. I'd be more comfortable and productive if they were replaced by

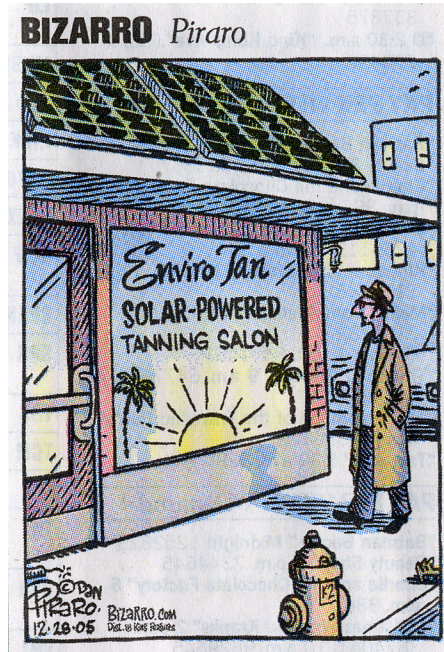
- A. Kalwall
- B. bronze reflective glass
- C. low-E glazing
- D. all of the above

10. The best way to improve the performance of an uninsulated cathedral ceiling in a residence

- A. insert an insulated dropped ceiling
- B. add a ventilated cold roof
- C. apply interior rigid insulation to the roof
- D. none of the above

11. The Shop and the Shop Crit are a good example of
  - A. mixed-use
  - B. spaces in the same thermal zone
  - C. good daylighting
  - D. spaces with different thermal needs
  
12. BedZED's wind cowls are a successful passive strategy because
  - A. they allow stack ventilation
  - B. they provide ventilation air at near room temperature year-round
  - C. they are fan powered
  - D. all of the above
  
13. The double glazed wall on KU's Marvin Hall addition is effective because
  - A. it has internal shading devices to control heat and light penetration
  - B. it releases warm air to the classrooms at night
  - C. it acts as a trombe wall
  - D. all of the above
  
14. For a house in a climate that requires both heating and cooling the best shape and orientation is
  - A. elongated on a SE-NW axis
  - B. elongated on a ESE-WNW axis
  - C. elongated on a WSW-ENE axis
  - D. elongated on a SW-NE axis
  
15. HEED is a great tool for modeling the thermal performance of
  - A. a passive solar house
  - B. a mid-rise mixed-use building
  - C. an all-glass skyscraper
  - D. all of the above
  
16. Photovoltaic glass with opaque solar cells can be used as
  - A. atrium glazing
  - B. horizontal shading on south facades
  - C. a west-facing curtain wall
  - D. all of the above
  
17. Which of the following is not a component of an active solar system?
  - A. A flat plate collector
  - B. A thermal storage device
  - C. A heat delivery medium
  - D. all of the above are

18. A building integrated PV roof should
- face south-ish
  - be insulated
  - have ventilation beneath the PVs (cold roof)
  - all of the above
19. It's not surprising that PV installations on single family residences is booming in Honolulu, because
- Hawai'i is very sunny
  - Honolulu's electricity rates are high
  - PV prices have fallen dramatically in the last decade
  - all of the above
20. A building that is LEED certified
- is designed to be more energy-efficient than a current code compliant building
  - is sustainable
  - is beautiful
  - all of the above



## Part 2—Questions on New Material

21. Which residential mechanical system delivers heat primarily by convection?
- A wood burning stove
  - A conventional furnace
  - An air-to-water heat pump
  - All of the above
22. Replacing a swamp cooler for a Phoenix, AZ, house with a air-to-air heat pump will result in
- less efficient summer cooling
  - addition of heating capability
  - water savings
  - all of the above
23. A fireplace with a heat-a-lator delivers heat to its room's occupants by
- convection
  - radiation
  - both of the above
  - none of the above
24. Displacement ventilation systems are effective because
- conditioned air is brought into the space at the occupants' level
  - their supply air temperatures are more moderate than other systems'
  - air movement in the space is gentle, caused by convection
  - all of the above

25. Mechanical systems are used as expressive exterior design elements in
- the Pompidou Center
  - Lloyd's of London
  - the Blue Cross Building in Boston
  - all of the above
26. Interior dominated load (IDL) buildings in temperate climates require
- no heating
  - only perimeter heating
  - heating in January only
  - no cooling
27. Arup Campus exemplifies daylight integration with
- shading systems
  - structural systems
  - ventilation systems
  - all of the above
28. The curtain wall shading system (blinds) at Arup Campus is successful because
- it is totally controlled by the building management system (BMS)
  - there are manual over-rides to the BMS control
  - it is totally manually controlled
  - it is enclosed in a double skin
29. Which of the following can contribute to poor indoor air quality?
- old books
  - VOCs in cleaning solutions
  - radon gas
  - all of the above



30. The sick building syndrome can be mitigated by
- A. adequate natural ventilation
  - B. keeping humidity levels between 40% and 60%
  - C. separate, ventilated rooms for copy machines
  - D. all of the above
31. The three criteria for an intelligent building include
- A. total reliance on high technology
  - B. portability of design to any site worldwide
  - C. addressing crucial environmental conditions
  - D. all of the above
32. The main factor causing complexity in an absorption cooling system is
- A. addition of solar thermal panels to raise efficiency
  - B. maintaining system equilibrium
  - C. connection to a chilled beam system
  - D. all of the above
33. As an example of integrated design, the Chesapeake Bay Foundation's Merrill Environmental Center successfully integrated
- A. only cutting edge technology
  - B. only passive design techniques
  - C. high technology with passive and low-tech design
  - D. none of the above
34. For natural ventilation, the Chesapeake Bay Foundation's Merrill Environmental Center
- A. relies on its BMS to operate the windows
  - B. allows manual override of BMS operation of windows
  - C. relies on the BMS to inform users when they may open windows
  - D. only has manually operated windows
35. Like many green buildings the Crystal in London features
- A. a dashboard that reports building performance
  - B. a green roof
  - C. manually operated ventilation windows
  - D. all of the above
36. Like many green buildings Scottish Parliament in Edinburgh features
- A. a dashboard that reports building performance
  - B. a green roof
  - C. manually operated ventilation windows
  - D. all of the above

37. Which of the following green buildings is least green?
- The Crystal
  - Scottish Parliament
  - John Hope Gateway
  - London City Hall (GLA)
38. Which of the following elevator types is most feasible for a mid-rise building during its construction?
- traction
  - hydraulic
  - rack and pinion
  - all of the above
39. The type of elevator that requires a mechanical penthouse is
- hydraulic
  - electric traction
  - rack and pinion
  - none of the above
40. In order to accomplish its sloped path from ground level to the second stage, the elevator in the Eiffel Tower is
- hydraulic with a hidden tank room
  - traction without a penthouse
  - rack and pinion
  - none of the above

***Have a happy and restful holiday!***

