

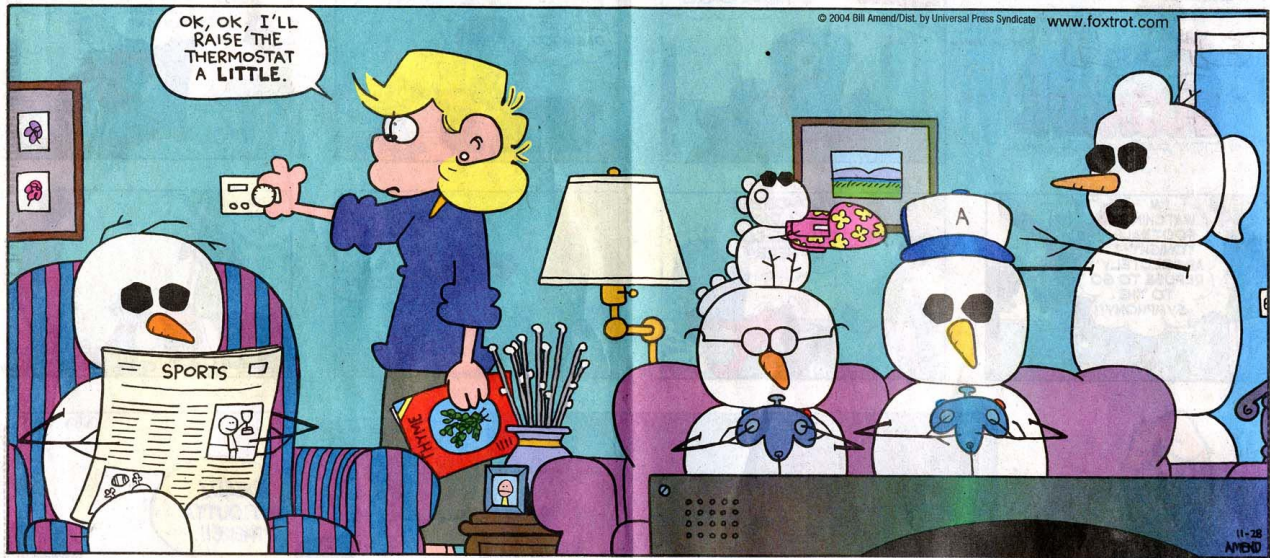
Arch 463
ECS
Fall 2004

Name _____

FINAL

40 Multiple Choice Questions

FOXTROT/ by Bill Amend



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

- The standard comfort zone on the bioclimatic or psychrometric chart represents conditions in which
 - 100% of the people are comfortable
 - about 80% of the people are comfortable
 - half of the people are comfortable
 - about 20% of the people are comfortable
- Adaptive comfort theory professes that during the summer in a naturally ventilated building
 - occupants will be comfortable at higher temperatures than in winter
 - only occupants from hot climates will be comfortable
 - the standard comfort zone must be adjusted for clo levels
 - none of the above
- The main reason for Seattle's mild climate is
 - its latitude
 - its proximity to water
 - its proximity to the mountains
 - its prevailing winds

4. Which microclimatic effect is most influenced by night sky radiation
 - A. the valley effect
 - B. the water body effect
 - C. the city effect
 - D. none of the above

5. The data loggers and handheld instruments used for site analysis at Virgil Phillips Park
 - A. helped gain an absolute understanding of site conditions
 - B. helped identify prevailing wind directions
 - C. helped understand trends and differences on the site
 - D. all of the above

6. The sun angle calculator is a good tool for
 - A. designing shading devices for all orientations
 - B. designing shading devices for south-facing windows
 - C. determining solar access on a site
 - D. describing your building's solar envelope

7. Computer-based solar analysis tools like the Solar Tool are attractive because
 - A. they deal with complex geometry easily
 - B. they are more accurate than any other method
 - C. a range of "what if" scenarios can be examined easily
 - D. all of the above

8. A balance point temperature lower 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

9. The reason that a weather-stripped single-pane window seems to cause cold drafts on a cold day is
 - A. cold air leaks through the glass
 - B. conductive heat loss causes it to have a low surface temperature
 - C. radiant losses to the night sky are severe
 - D. all of the above

10. On the summer solstice at latitudes above the Arctic Circle, the sun rises
 - A. due east
 - B. north of due east
 - C. south of due east
 - D. not at all—it neither rises nor sets

11. Passive strategies that can help reduce the cooling load of a mid-rise office building in a temperate climate include

- A. external shading
- B. daylighting
- C. night-flush ventilation
- D. all of the above

12. When designing a building for stack ventilation, you might consider using

- A. stair towers
- B. an atrium
- C. heat recovery ventilation towers
- D. all of the above

13. Thermal mass is effective in controlling temperatures in a building because

- A. it releases cool air during the day
- B. it releases warm air at night
- C. both of the above
- D. it absorbs radiation from warmer objects and radiates to cooler objects

14. The best window configuration for a west-facing wall of an office building is

- A. a commercial low-e curtain wall
- B. a horizontal band of clerestory windows with an external horizontal shading device
- C. a series of 3.5' x 3.5' punched windows with external horizontal and vertical shading
- D. several narrow vertical windows with reflective bronze glazing

15. You'd expect a new passive solar house in Moscow to

- A. be well insulated
- B. include plenty of thermal mass
- C. use more total energy than a built to code house
- D. all of the above

16. Indirect passive solar heating is most effective for large office buildings because

- A. it can offer means to control timing of solar gain
- B. it can provide heating during the evenings
- C. these buildings do not require very much heating
- D. all of the above

17. Superinsulated walls are superior to code-insulated walls because

- A. their surface temperature is usually closer to room temperature
- B. vapor barriers can be installed deep enough into the wall to retain integrity
- C. they lose less heat in winter and gain less in summer
- D. all of the above

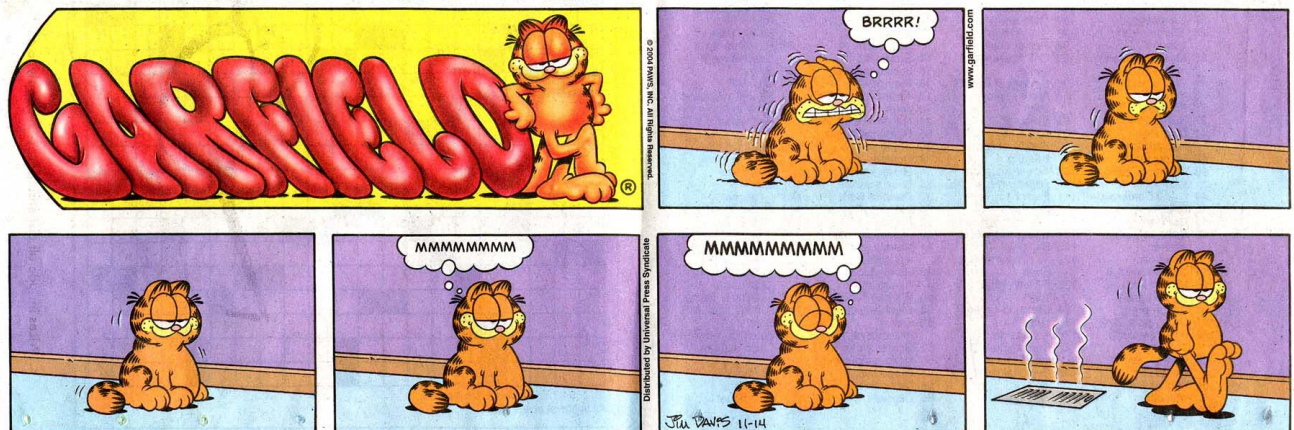


18. The glazing that is the most effective shading device is
- A. silica aero-gel glass
 - B. blue-green glass
 - C. 80% fritted glass
 - D. bronze reflective glass
19. Double skin walls are effective because they
- A. contain protected external shading devices
 - B. can be integrated into the natural ventilation scheme
 - C. provide thermal and acoustic buffers between inside and outside
 - D. all of the above
20. A building that is LEED certified
- A. is more energy-efficient than a current code compliant building
 - B. is sustainable
 - C. is beautiful
 - D. all of the above

Part 2—Questions on New Material

21. The best approach to designing intelligent buildings is
- A. the American approach
 - B. the Japanese approach
 - C. the European approach
 - D. an appropriate combination of two or more approaches
22. Intelligent building is concerned with
- A. technology that solves building management problems
 - B. occupant issues that include the thermal, acoustic, and visual environments
 - C. building massing and orientation in response to environmental forces
 - D. all of the above
23. A fireplace with a heatator delivers heat to its room's occupants by
- A. convection
 - B. radiation
 - C. both of the above
 - D. none of the above
24. Modern high-efficiency furnaces are most efficient when
- A. combustion air is piped directly into the firebox
 - B. exhaust air is so cool a plastic flue can be used
 - C. both of the above
 - D. none of the above

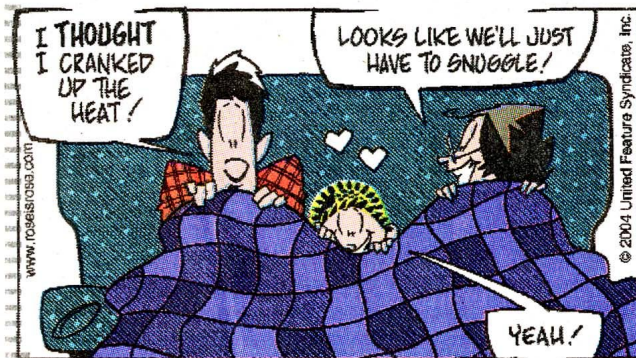
25. Radiant floors
- were used by the ancient Greeks and Koreans
 - can use either air or water as the heat delivery medium
 - can use solar energy to provide heating
 - all of the above
26. In order to minimize the size of the HVAC system, design the building to
- have no more than 5 thermal zones
 - take advantage of daylight, natural ventilation, and solar heating
 - require the use of displacement ventilation
 - all of the above
27. A contemporary 4-story, mixed-use building on an infill lot in Minneapolis is a candidate for
- a geo-exchange system
 - a direct expansion system
 - a multi-sense system
 - any of the above
28. The major advantage of a hybrid air/water dual duct high velocity system is
- reduced noise
 - reduced duct size
 - the use of an energy wheel
 - all of the above
29. The best place for a cooling tower for an urban building is
- on the roof top
 - in one of the mechanical floors
 - in a park or plaza close to the building
 - none of the above
30. For a twenty-story building, you should plan for
- at least 4 mechanical floors
 - three mechanical floors
 - mechanical floors in the basement and at the roof top
 - individual mechanical units at each level



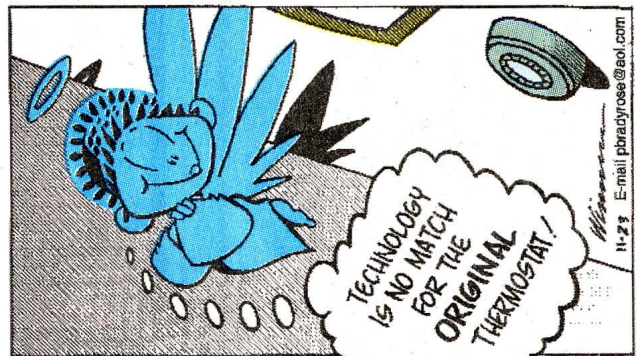
31. HVAC components can be integrated with a building's
- A. stair towers
 - B. structural system
 - C. aesthetics
 - D. all of the above
32. A building that demonstrates a clear example of aesthetic HVAC ductwork integration is
- A. Boston City Hall
 - B. Richards Labs at Penn
 - C. Kansai International Airport
 - D. The Pompidou Centre
33. If the wet bulb temperature equals the dry bulb temperature,
- A. the relative humidity is 0%
 - B. the relative humidity is 100%
 - C. water will evaporate
 - D. none of the above
34. When plotting the heating of air on the psychrometric chart
- A. the plotted line will eventually intersect the dew point
 - B. the relative humidity remains constant
 - C. the humidity ratio remains constant
 - D. the enthalpy remains constant
35. Mechanical cooling systems are designed to
- A. remove sensible heat
 - B. remove latent heat
 - C. remove sensible and latent heat
 - D. change the enthalpy
36. An appropriate mechanical cooling system for a mid-sized commercial building using a VAV HVAC system in a humid temperate climate is
- A. absorption cooling
 - B. compression cooling
 - C. evaporative cooling
 - D. either A or B above
37. Sick building syndrome can be caused by
- A. leaky flat roofs
 - B. excessive humidity
 - C. off-gassing of toxic fumes
 - D. all of the above

38. Ventilation to reduce the chance of SBS occurring can be accomplished by
- operable windows
 - whole building fans
 - heat recovery ventilators
 - all of the above
39. The type of elevator that requires a mechanical penthouse is
- hydraulic
 - electric traction
 - platform
 - all of the above
40. The elevator in Pei's pyramidal addition to the Louvre is
- hydraulic with a hidden tank room
 - traction with hidden penthouse
 - a new invention
 - none of the above

Rose is Rose



Pat Brady and Don Wimmer



Have a happy and restful holiday!