Arch 463
ECS
Fall 2004 Name_____

Midterm I

30 Multiple Choice Questions

1. The shading devices for the Arup Campus project by Arup Associates feature
   A. automatic control by the building management system (BMS)
   B. control override by occupants of the space
   C. externally mounted shades as well as internal blinds
   D. all of the above

2. Wind-powered ventilation devices are a design element for
   A. vernacular buildings in some hot arid climates
   B. the Harare International School in Zimbabwe
   C. the Beddington Zero Energy Development (BedZED) pictured in the title block of the Arch 463 web pages
   D. all of the above

3. You've done a good job of designing a space for human comfort
   A. only when 100% of the occupants are comfortable
   B. about 80% of the occupants are comfortable
   C. a majority of the occupants are comfortable
   D. only when mechanical heating and cooling are provided

4. Adaptive comfort theory professes that
   A. people adapt their clothing levels to compensate for excess air-conditioning
   B. that outdoor weather conditions affect the comfort requirements of occupants of naturally ventilated buildings
   C. natives of hot humid climates will readily adapt to cool temperate climates
   D. all of the above

5. When climate data is plotted on the Bioclimatic Chart, you can
   A. easily tell if it is a humid or dry climate
   B. determine the effective months for natural ventilation of an IDL building
   C. see how much sun is available for passive heating
   D. all of the above

6. In the Northern and Southern Hemispheres the temperate climate zone occur
   A. at similar altitudes
   B. at similar distances from the ocean
   C. at similar latitudes
   D. only where prevailing winds are blocked seasonally

7. For two West Coast towns located at 40º South Latitude, the climate of the coastal town
   A. is more extreme than that of the town located 50 miles inland
   B. is about the same as that of the town located 50 miles inland
   C. is more moderate than that of the town located 50 miles inland
   D. is totally unrelated to that of the town located 50 miles inland

8. The combination of landform and prevailing winds in the Pacific Northwest causes
   A. the Northeast corner of the Olympic Peninsula to be extra rainy
   B. lush vegetation on the eastern slopes of the Cascade Range
   C. milder than expected winters in Moscow
   D. all of the above

9. The Pacific Northwest season that experiences unique prevailing wind patterns is
   A. spring
   B. summer
   C. autumn
   D. winter

10. The microclimatic differences at Steptoe Butte are caused by its topography, sun exposure, and
   A. spring-fed streams
   B. prevailing winds
   C. the city effect of nearby Spokane
   D. all of the above

11. The valley effect is characterized by
   A. constant windflow up the valley
   B. cloud formation on the ridges
   C. on-shore and off-shore breezes
   D. none of the above

12. A design strategy that can help mitigate the city effect is providing
    A. underground parking structures
    B. green roofs
    C. street trees
    D. all of the above

13. A one-day site visit with handheld instruments and dataloggers can help you understand
    A. the overall climate features of a site
    B. the absolute value of temperature and humidity readings
    C. the nuances of microclimatic difference on the site
    D. all of the above

14. A body media sensor that measures your vital signs has the potential to
    A. predict human comfort in laboratory settings only
    B. correlate objective measured data with sensed subjective data in real workplaces
    C. provide graphic representation of survey data
    D. none of the above

15. Narrow streets are a typical vernacular response to
    A. cold climates
    B. temperate climates
    C. hot arid climates
    D. hot humid climates

16. Examples of climatically and regionally appropriate vernacular architecture can inspire modern sustainable design because
    A. energy issues may be dealt with in an efficient manner
    B. regional materials may be used appropriately
    C. site and city scale massing may be addressed effectively
    D. all of the above

17. In what type of climate would you design a sustainable building that featured a large overhanging roof and ample windows?
    A. cold climate
    B. temperate climate
    C. hot arid climate
    D. hot humid climate

18. The type of sun chart that can help you design effective shading devices for a SW-facing window is

A. an elevational sun chart
B. a sun angle calculator
C. a constructed solar envelope
D. all of the above

19. The next day that the sun can shine in a 2' x2' north window in Moscow, Idaho with a two-foot horizontal shading device mounted directly above it is

A. January 1, 2005
B. March 22, 2005
C. June 21, 2005
D. never

20. The main advantage of an interactive 3-D computerized sun chart such as the *Solar Tool* is

A. accuracy
B. the ability to examine alternatives and scenarios rapidly
C. reliability
D. all of the above

21. When considering the effect of the sun on the interior of a building, a double-hung window serves as a

A. switch
B. connector
C. filter
D. barrier

22. It would be easiest to design a thermally stable environment for weather-sensitive equipment by specifying a space dominated by

A. filters on the surface layer
B. connectors in the sky layer
C. switches on the near-surface layer
D. barriers in the subsurface layer

23. A green roof is an effective response to the city effect because

A. it is permeable to wind flow
B. it shades paved parking surfaces
C. it can control its storm water run-off
D. all of the above

24. If a thermal zone's balance point temperature is greater than the outdoor temperature during the night, a good strategy for energy conservation would be

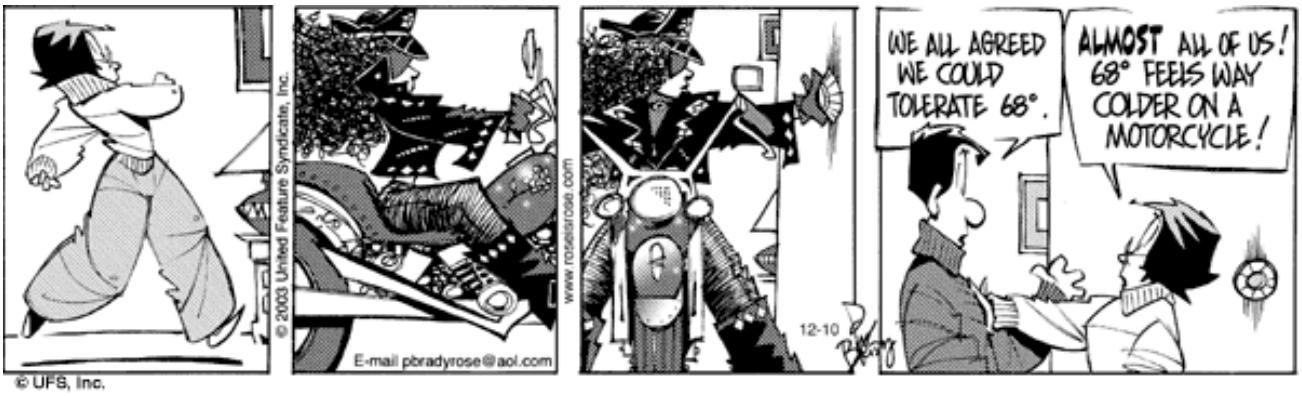
A. night ventilation
B. nighttime thermostat set-back
C. solar heating
D. all of the above

25. A thermally elegant building consists of

A. a thermal zone for each use
B. no more than 3 thermal zones
C. a building program that maps onto a minimum number of thermal zones for its size and complexity
D. open spaces around a central core

26. Conductive heat flow through the skin of a building is caused by

A. air leaks in the fabric of the building skin
B. thermal bridges in the construction
C. a temperature difference between inside and outside
D. large windows



27. A composite wall made up of two materials; one with an R-Value of 4 and the other with a C-Value of 0.2; (ignoring the effect of inside and outside air films) will have a resultant U-Value of

A. 0.11
B. 0.24
C. 0.45
D. 4.2

28. An insulated wall is superior to an uninsulated wall because

A. it reduces heat transfer through the building skin
B. it increases comfort by providing radiant temperatures near room air temperature
C. it moves the winter dew point further into the wall
D. all of the above

29. Thermal bridging at the eave of a gable roof can be avoided by
    A. weather stripping
    B. caulking
    C. both of the above
    D. raising the rafter a foot above the top plate of the wall so a thick blanket of insulation can be extended to the eave

30. Where is the sun at sunset on the day after the winter solstice on the Arctic Circle?
    A. due west
    B. a bit north of west
    C. due south
    D. a bit south of west

Passive strategies will be covered on the second mid term exam.