

Arch 463
ECS
Fall 2017

Name _____

Midterm I

30 Multiple Choice Questions

1. The earth's ecological capacity to provide resources for its inhabitants was reached when the population was
 - A. about 3 billion
 - B. 4 billion
 - C. approaching 5 billion
 - D. over 6 billion
2. Advocates for mitigating climate change include
 - A. Pope Francis
 - B. NASA scientist James Hansen
 - C. Ed Mazria
 - D. all of the above
3. During a single site visit you can
 - A. determine prevailing wind direction
 - B. discover micro-climates
 - C. plot potential sun path obstructions
 - D. all of the above except A
4. Off-site you can conduct site analysis by
 - A. plotting your climate on the bioclimatic chart
 - B. using a site model with a sun peg chart
 - C. discovering seasonal wind pattern with Climate Consultant
 - D. all of the above
5. Precise knowledge of sun paths
 - A. has existed for millennia
 - B. was established by Galileo in the 17th century
 - C. began during the industrial revolution
 - D. was necessitated by NASA's space exploration
6. On a sunny day in the Northern Hemisphere the north facade of buildings experience direct sun
 - A. on the summer solstice
 - B. all summer
 - C. from spring equinox until fall equinox
 - D. none of the above

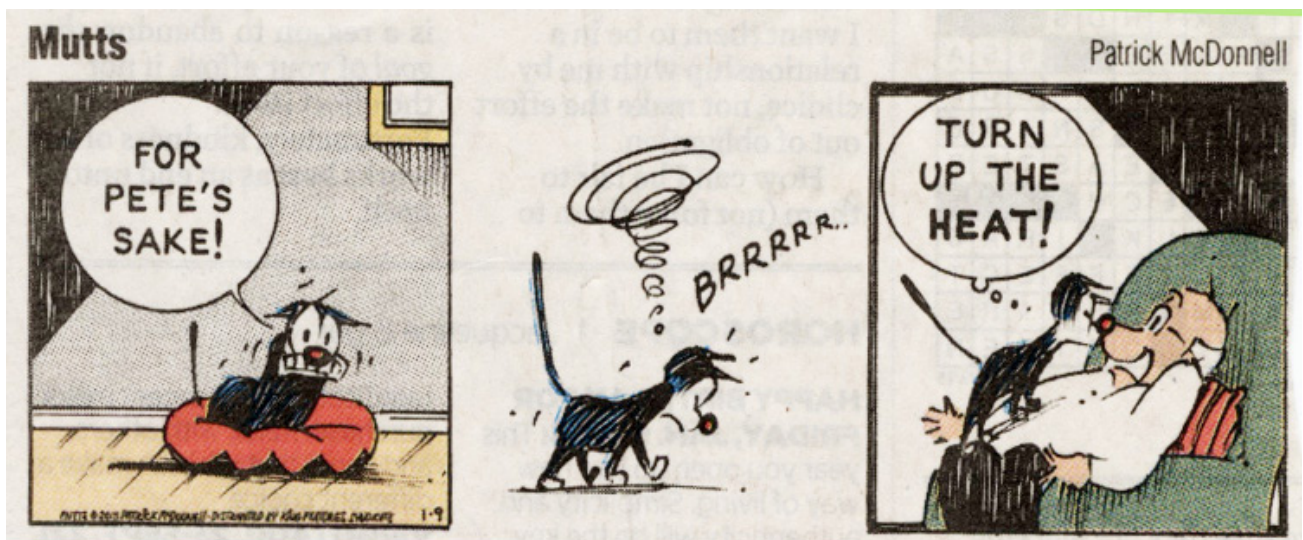


Solar cat

7. The three-dimensional path of the sun is best understood by using
- an LOF Sun Angle Calculator
 - an elevational sun chart
 - a physical model and sun peg chart
 - all of the above
8. To remain comfortable at cool temperatures a person must
- gain heat from the environment
 - slowly lose heat to the environment
 - shiver
 - none of the above
9. A factor that affects a person's comfort is
- clo level
 - met rate
 - temperature and humidity
 - all of the above
10. Convection causes wind flows
- at the global scale
 - near bodies of water
 - in valleys
 - all of the above
11. In Norberg-Schultz's terminology the ideal path from environmental source to building occupants in a passive building in a temperate climate would be a
- connector
 - filter
 - barrier
 - switch
12. In his autobiography and in his built work, Frank Lloyd Wright demonstrated
- innate knowledge of micro-climatic effects
 - lack of appreciation for building siting
 - use of form follows function
 - all of the above
13. Urban heat islands (the city effect) are caused by
- waste heat from vehicles and buildings
 - stormwater run-off due to impervious surfaces
 - clusters of tall buildings that slow wind speeds at street level
 - all of the above



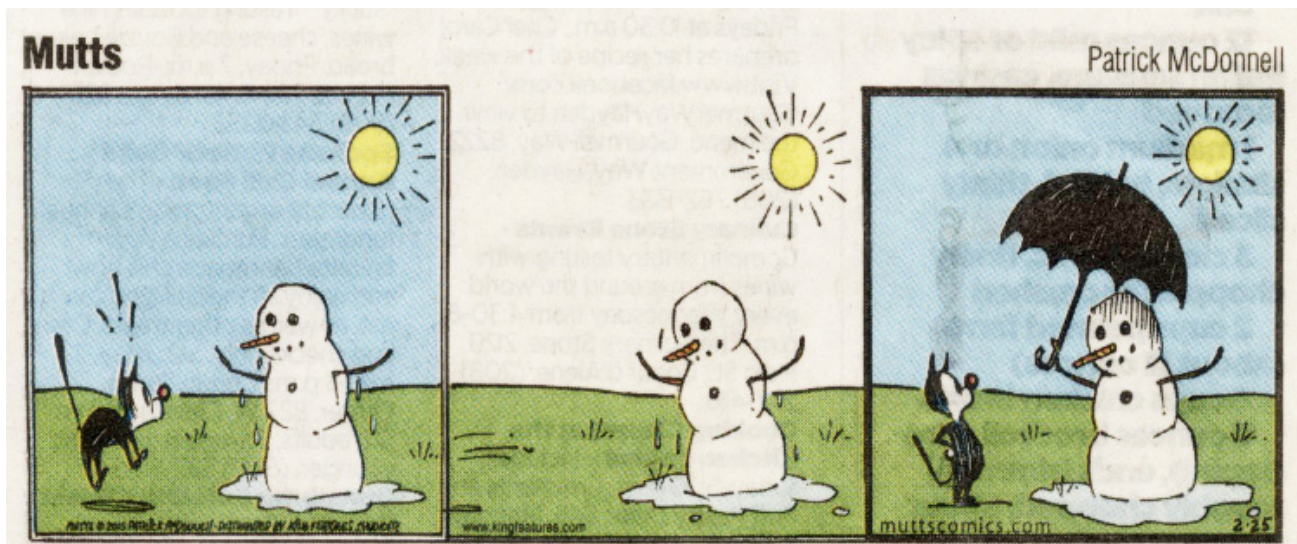
14. Urban heat islands (the city effect) can be mitigated by use of
- daylighting
 - green roofs
 - increased mass transit
 - all of the above
15. The climate atlas of the Pacific Northwest maps Moscow's climates as
- coastal
 - lowland
 - intermontane
 - Rocky Mountain
16. The climate anomalies that make Sequim dry and Moscow moist and mild in winter are
- caused by regional mountainous topography
 - prevailing wind patterns
 - both of the above
 - none of the above



Non-solar cat

17. The climate data most commonly used in thermal modeling of building performance during the design phase
- gives an accurate description of today's climate
 - is based on average data from 1961 to 1990
 - is based on average data from 1990 to 2005
 - includes site-based micro-climatic effects
18. An estimate of available potential energy produced by on-site photovoltaics can be
- made by the Climate Consultant
 - calculated from the building's projected EUI
 - determined by using PVWatts
 - all of the above

19. In general, if a building is aiming to meet the Architecture 2030 goals its EUI should be
- 100 kbtuh/sqft/year or less
 - 50 kbtuh/sqft/year or less
 - 20 kbtuh/sqft/year or less
 - 5 kbtuh/sqft/year or less
20. Heating and cooling loads through the building skin are due to
- radiation
 - infiltration
 - conduction
 - all of the above
21. In order to achieve comfort, a person must
- lose a bit of heat to the environment
 - gain a bit of heat from the environment
 - have an elevated metabolism rate
 - none of the above



22. The balance point temperature for a building
- is a constant
 - determines the comfort zone
 - is the temperature at which the building requires neither heating nor cooling
 - all of the above
23. Architecture 2030 has determined that when performance modeling is used during design, compared to those whose performance hasn't been modeled, buildings are
- more likely to beat energy code requirements
 - more likely to achieve Architecture 2030 goals
 - more likely to save more energy
 - equally likely to achieve high performance

24. The inherent value of vernacular architecture is
- in identifying climate appropriate architectural strategies
 - in preserving the rich history of local architecture
 - a demonstration of local materiality
 - all of the above
25. Traditional Japanese houses perform well in their temperate climate because
- they have sufficient thermal mass
 - they allow occupants to adjust apertures to achieve comfort
 - they also provide evaporative cooling
 - all of the above
26. The number one passive cooling strategy for hot humid summers is
- shading
 - earth tubes
 - night ventilation of thermal mass
 - daylighting
27. Passive heating and cooling strategies can be effective
- 100% of the time for most of the continental U.S.
 - 80% of the time for most of the continental U.S.
 - 40% of the time for all of the continental U.S.
 - none of the above
28. Blue-green and bronze glazing are equally effective for reducing solar heat gain, but blue-green is a superior performer because
- it has higher visual transmission
 - it has higher heat transmission
 - it has higher visual transmission and lower heat transmission
 - none of the above
29. The R-value of a wall containing framed insulated wall portions, windows, and doors is
- the sum of each component's R-value
 - equal to the lowest R-value of any of the components
 - a weighted average by area of all the components
 - none of the above
30. Stack ventilation can be intensified by using
- solar heated stacks
 - wind cowls
 - operable leeward clerestory windows
 - all of the above

