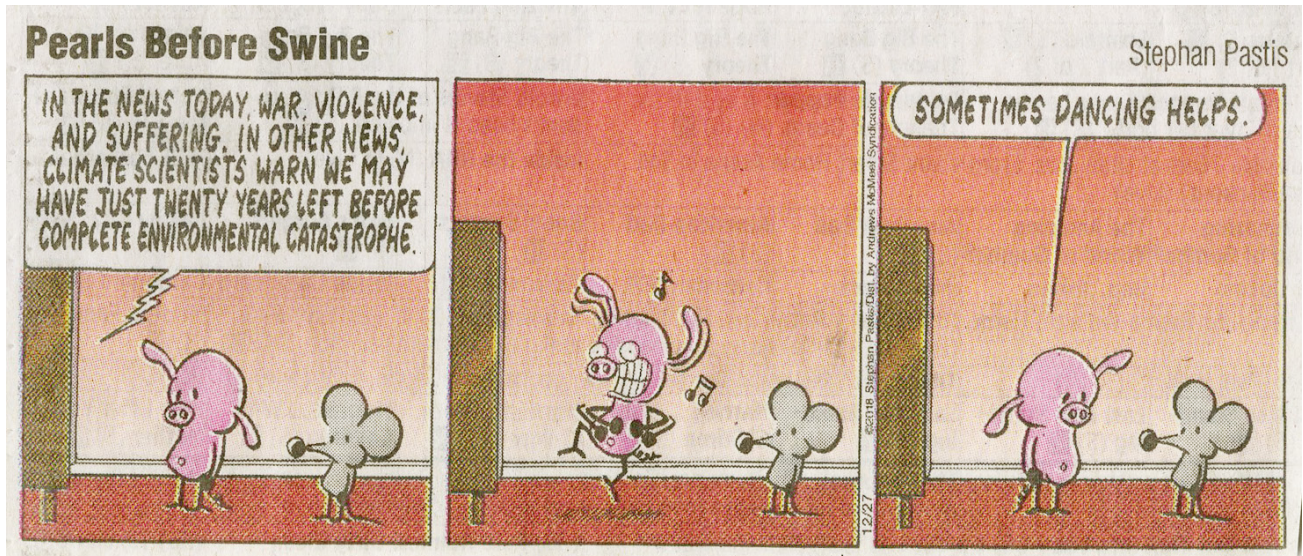


Arch 463
ECS
Fall 2019

Name _____

Midterm I

30 Multiple Choice Questions



- Which group of architects has declared a climate emergency this year?
 - British Sterling Prize winners
 - UK Architects
 - AIA
 - all of the above
- Architecture 2030's goal for carbon emissions reductions next year is
 - 50% from the building type average
 - 60% from the building type average
 - 70% from the building type average
 - 80% from the building type average
- The most useful information you can derive from a single site visit is
 - to determine prevailing wind direction
 - to record temperature and relative humidity
 - plot potential sun path obstructions
 - all of the above
- The result of good site analysis is
 - finding the best position for passive heating
 - finding a position that has advantageous sun and wind conditions for heating and cooling
 - finding the best spot to avoid late afternoon sun
 - none of the above

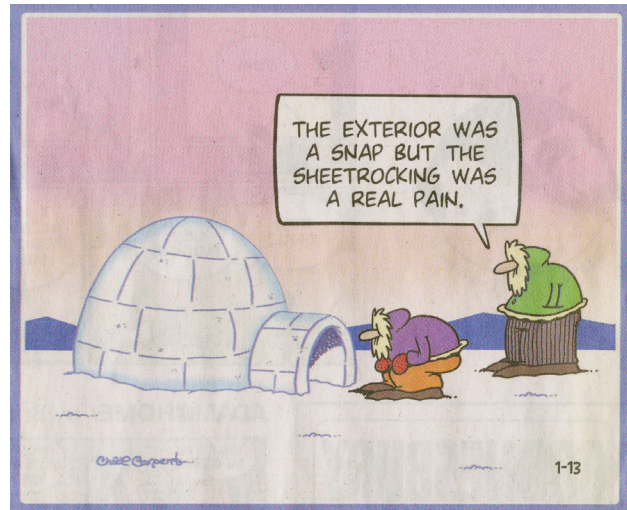
5. A sun dial can be mounted on
- a south-facing wall
 - a horizontal plane
 - the corner of south- and east-facing walls
 - all of the above
6. Constructing a solar envelope for your site
- indicates possible solar access
 - describes all summer sun angles
 - sets "good solar neighbor" limitations for your building
 - all of the above
7. Variables that affect human comfort include
- gender
 - clothing level
 - radiation
 - all of the above
8. To remain comfortable at temperatures above skin temperature a person must
- gain heat from the environment
 - lose heat to the environment
 - sweat
 - B and C above
9. Prevailing winds in the northern hemisphere
- always blow from the southwest
 - always blow from the southeast
 - blow from SE or NW
 - blow from SW or NE
10. The ideal window for a residence in a temperate climate is
- a connector to the sun
 - a barrier to the wind
 - a filter for light
 - a switch
11. Frank Lloyd Wright's boyhood home in Wisconsin was sited "on a gently sloping hillside facing south." This is appropriate for
- a cool climate
 - a temperate climate
 - a hot arid climate
 - A and B above




12. Vernacular home sites in Oregon's Willamette Valley take advantage of daytime summer winds from the north, which are
- prevailing winds
 - thermal breezes
 - on-shore winds
 - all of the above
13. Summers in the Pacific Northwest's Intermontane Climate Zone are best classified as
- temperate
 - hot humid
 - hot arid
 - a little of each of the above
14. Vegetation at the foot of a butte indicates
- more rainfall
 - protection from drying winds
 - cool air pockets
 - none of the above
15. TMY3 weather files are
- formed from historic data
 - formed from predicted data
 - morphed 2020 weather data
 - morphed 2080 weather data
16. Using future weather data allows designers to
- be sure their buildings can adapt to predicted climate
 - confirm which strategies will work during the building's lifetime
 - model future energy use of their buildings
 - all of the above
17. A building with high internal loads will
- have a high balance point temperature
 - require heating year round
 - have a low balance point temperature
 - require cooling year round
18. Energy Use Index (EUI) is an important figure because
- it allows performance comparisons among diverse buildings
 - it helps assess whether a building can achieve net zero with on-site energy production
 - it can be modeled during the design process
 - all of the above
19. The toldos employed to shade narrow streets in Madrid are
- vernacular architecture responses to local climate
 - appropriate to hot arid conditions
 - both of the above
 - none of the above



20. Climate-responsive vernacular architecture in temperate zones
- usually feature switches or migration strategies
 - are all passively heated
 - are all night ventilated for cooling
 - all of the above
21. Thermal mass is an essential element in
- direct gain solar heating
 - indirect gain solar heating
 - night ventilation cooling
 - all of the above
22. If your building cannot be oriented to true south, effective passive heating can best be accomplished by
- west-facing windows
 - east-facing windows
 - southeast facing windows
 - all of the above
23. If your horizontal shading device on a south-facing wall shades completely at noon in the summer,
- it will allow solar gain to commence minutes later
 - it will allow all winter solar gains
 - it will completely block sun all day
 - C above only if it is sufficiently wider than the window below it
24. An egg-crate bris soliel can be tuned for effectiveness on a west façade
- by increasing the scale of the openings
 - by twisting the vertical members toward the south
 - by twisting the vertical members toward the north
 - only if the horizontal members are movable
25. Silica aerogel improves the performance of double pane glazing
- by increasing daylight penetration
 - by greatly increasing R-value
 - by improving the color rendering of views
 - all of the above
26. Glazing that can perform a high degree of shading is
- electro-chromatic glass
 - fritted glass
 - photovoltaic glass
 - all of the above



27. The variable that specifies the time for conductance through a composite wall is its
- C-value
 - R-value
 - U-value
 - none of the above
28. Continuous insulation that envelopes an entire building is advantageous because
- is effective in arctic climates
 - it prevents/reduces thermal bridging
 - it assures that thermal mass is internal
 - all of the above
29. Natural ventilation in hot arid climates can be effective
- at all times
 - daytime only
 - at night with thermal mass
 - at no time
30. Stack ventilation depends on
- solar heated stacks
 - convection
 - operable leeward clerestory windows
 - all of the above



Ask Marilyn
By Marilyn vos Savant

Say you have two identical houses, and the outdoor temperature is 32°F. The Smith thermostat is set to 75°F, and the Jones thermostat is set to 65°F. As each house cools from that temperature, its furnace runs and takes the temperature back up to its setting. Here's what stumps me: If each furnace is performing exactly the same operation (say, running when the indoor temperature drops by two degrees), why does the house with the higher setting use more energy?

—Jim S., Oregon, Ohio

The Smith house, due to its higher temperature differential (from the environment), will lose thermal energy to the outdoors faster than the Jones house, so the Smith furnace will run more—and use more energy.