

Arch 463
ECS
Fall 2016

Name _____

Midterm I

30 Multiple Choice Questions

1. In general the greatest observed rises in surface temperature since 1901 have occurred

- A. over the oceans
- B. in the far northern latitudes
- C. over China and the US
- D. at the equator

2. To meet the 2030 Challenge, a building built today must

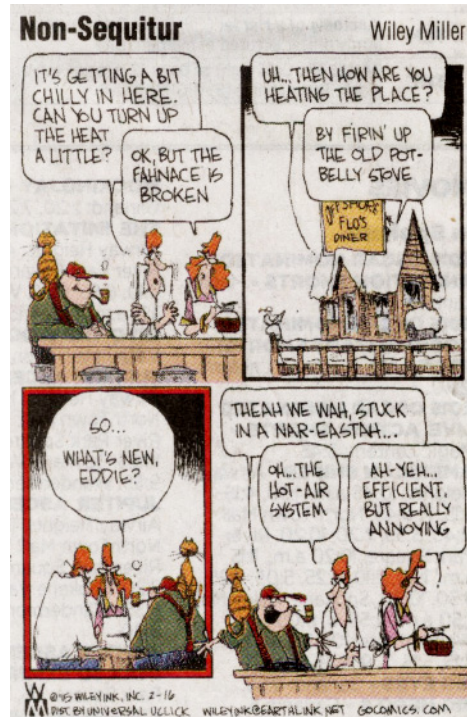
- A. be carbon neutral
- B. consume no more than 30% of fossil fuel-generated energy of an average building of its type
- C. consume no more than 50% of fossil fuel-generated energy of an average building of its type
- D. consume no more than 70% of fossil fuel-generated energy of an average building of its type

3. Scientists have linked global climate change to

- A. rising ocean levels
- B. severe draughts
- C. increases in forest fires
- D. all of the above

4. The Climate Consultant is a powerful site analysis tool because

- A. it plots your climate on the bioclimatic chart
- B. it compares your climate to the national average
- C. it allows you to view wind wheel data for selected times of year
- D. all of the above



5. Using a site matrix to score site locations for summer and winter conditions
- helps determine optimum siting for a passive building
 - identifies migration patterns on the site
 - ignores site vegetation
 - all of the above
6. In the Northern Hemisphere sundials may be placed
- on a south-facing vertical wall
 - on a horizontal surface
 - a south by southwest corner of a building
 - any of the above
7. The solar horizon for a specific location on a site can easily be plotted on
- an LOF Sun Angle Calculator
 - an elevational sun chart
 - a physical model
 - all of the above
8. Your local climate can be made more moderate by
- a mountainside location
 - large bodies of water (oceans!)
 - proximity to an urban area
 - none of the above
9. The best way regulate seasonal access to environmental forces is with a
- connector
 - switch
 - barrier
 - filter
10. An architect has located her new building in the optimal position on a hillside in a hot arid climate, it's sited
- at the hilltop
 - on the brow of the hill
 - near the middle of the hillside
 - at the foot of the hill
11. The city effect is abetted by
- lack of pervious surfaces
 - waste heat from buildings and transportation
 - lots of thermally massive surfaces
 - all of the above



12. The Pacific Northwest's most moderate climate zone is
- A. intermontane
 - B. lowlands
 - C. coastal
 - D. Cascades
13. In the Pacific Northwest, Moscow's milder than expected winters and Sequim's more arid than expected climate
- A. are caused by prevailing winds and topography
 - B. are explained by proximity to the Pacific Ocean
 - C. are the result of El Niño
 - D. all of the above
14. The most arid microclimate found at Steptoe Butte is located
- A. at the base of the butte
 - B. at the summit
 - C. on the southern slope
 - D. none of the above, it's all very moist
15. The thermal load on a building that is beneficial to passive design during both summer and winter is
- A. conduction
 - B. infiltration/ventilation
 - C. radiation
 - D. none of the above
16. Plotting seasonal diurnal balance point temperatures for a building helps identify
- A. effective shading strategies
 - B. heating and cooling seasons
 - C. the EUI of the building
 - D. all of the above
17. Thermal modeling of building performance during the design phase
- A. gives accurate measures of energy efficiency
 - B. ensures high performance in future climates
 - C. helps decide among design alternatives
 - D. all of the above
18. The best weather files for modeling a proposed building's performance are
- A. TMY files
 - B. TMY2 files
 - C. TMY3 or EPW files
 - D. none of the above

19. In general, if a building is aiming to meet the Architecture 2030 goals its EUI should be

- A. 100 kbtuh/sqft/year or less
- B. 50 kbtuh/sqft/year or less
- C. 20 kbtuh/sqft/year or less
- D. 5 kbtuh/sqft/year or less

20. In general factors that influence a person's perception of thermal comfort include

- A. age and gender
- B. acclimation to local conditions
- C. clothing levels
- D. all of the above

21. In order to achieve comfort, a person must

- A. lose a bit of heat to the environment
- B. gain a bit of heat from the environment
- C. have an elevated metabolism rate
- D. none of the above

22. A proven vernacular response to a hot humid climate is

- A. high thermal mass
- B. night ventilation
- C. shading
- D. all of the above

23. In Moscow the building surface that gets the most solar radiation per square foot in the summer is

- A. south-facing
- B. west-facing
- C. east-facing
- D. Horizontal (roof)

24. Indirect passive systems include

- A. Trombe walls
- B. water walls
- C. night ventilation
- D. all of the above

25. Native deciduous trees can act as an effective shading device

- A. only on the south side of the building
- B. because their amount of foliage is sensitive to the shift of the overheated period toward the fall
- C. because they also provide evaporative cooling
- D. all of the above



26. The number one passive cooling strategy is
- shading
 - earth tubes
 - night ventilation of thermal mass
 - daylighting
27. The type of glazing that can change its light and thermal transmission characteristics is
- low-e glazing
 - silica aerogel glazing
 - electrochromatic glazing
 - all of the above
28. Blue-green glazing is effective for daylighting because
- it has high visual transmission
 - it has high heat transmission
 - it has high visual transmission and low heat transmission
 - none of the above
29. The currently popular Passive House movement favors
- the light and tight philosophy
 - the mass and glass philosophy
 - a combination of both of the above
 - none of the above
30. Thermal bridging in the building envelope is most effectively mitigated by
- using windows with a thermal break
 - continuous external insulation on all surfaces
 - Larsen truss walls
 - recycled denim insulation

