

Arch 463
ECS
Fall 2003

Name _____

Midterm I

30 Multiple Choice Questions

- The Arup Campus project by Arup Associates is exemplary because it
 - is an example of integrated architecture and engineering design
 - aims to improve occupant productivity through sustainable design
 - allows users to override lighting and shading controls
 - all of the above
- The International School in Harare, Zimbabwe features
 - wind-powered ventilation turbines
 - advanced daylighting systems
 - Thrombe walls for passive heating and cooling
 - all of the above



- A young woman from a hot humid area in India is most likely to feel comfortable outdoors in the Palouse on a
 - hot August day
 - a cool September evening
 - a perfect spring day with sun, bees, and flowers
 - a cold sunny winter day

4. The bioclimatic chart illustrates how comfort can be attained when you vary
 - A. metabolism levels
 - B. building orientation
 - C. insolation levels in winter
 - D. all of the above

5. The interactive psychrometric chart by Square One allows you to see the effective comfort zone for different
 - A. clothing levels
 - B. metabolism rates
 - C. wind speeds
 - D. all of the above

6. The spherical shape of the earth is responsible for climate zones because
 - A. it causes differential wind flows
 - B. the sun's rays strike it with intensity that varies with latitude
 - C. it's relationship to the sun changes seasonally
 - D. the surface materials vary with altitude

7. For a town located in the plains at 40° South Latitude, the prevailing winds probably come from
 - A. the southwest
 - B. the northwest
 - C. the northeast
 - D. the ocean as on-shore and off-shore breezes

8. The thermal mass of the earth generally causes
 - A. daytime temperatures to peak after noon
 - B. spring equinox temperatures to be lower than those at the fall equinox
 - C. summer high temperatures to occur after the summer solstice
 - D. all of the above

9. The most moderate climate in the Pacific Northwest is
 - A. near the ocean
 - B. in inland valleys
 - C. on south-facing mountain slopes
 - D. on the Palouse

10. In the Pacific Northwest the prevailing winds and topography are responsible for the
 - A. relative dryness of Port Townsend on the NE corner of the Olympic Peninsula
 - B. relative warmth of the Palouse during the winter
 - C. the difference in precipitation of the western and eastern flanks of the Cascades
 - D. all of the above

11. The microclimate of a hillside site is affected by
- A. its orientation to the sun
 - B. its position on the hill (base, mid, crown, crest)
 - C. its relationship to prevailing winds
 - D. all of the above
12. Thermal winds can be caused by
- A. a nearby body of water
 - B. a shopping center with a surrounding asphalt parking lot
 - C. a narrow valley with steep walls
 - D. all of the above
13. You can instantly measure the surface temperature of wall with
- A. a Kestrel weather meter
 - B. a HOBO data logger
 - C. a Raytek spot pyranometer
 - D. all of the above
14. A Vital Signs case study of a building must include
- A. only measured environmental data
 - B. a testable hypothesis
 - C. computer-generated graphs of temperature
 - D. all of the above
15. A masonry building with a central courtyard is a typical and successful climate-responsive vernacular design for
- A. cold climates
 - B. temperate climates
 - C. hot arid climates
 - D. hot humid climates
16. A compact building form with small apertures is a vernacular response common to
- A. hot humid and hot arid climates
 - B. temperate and hot humid climates
 - C. temperate and hot arid climates
 - D. cold and hot arid climates



17. In Moscow, Idaho, the sun rises north of east
- A. all year
 - B. all summer
 - C. from spring equinox to fall equinox
 - D. on the summer solstice only
18. During a site visit, you can predict a good spot for a solar aperture for a new building by using
- A. an elevational sun chart
 - B. a sun angle calculator
 - C. a constructed solar envelope
 - D. all of the above
19. In Christian Norberg-Schultz source-path-receiver terminology, a fixed glass window is
- A. an ultimate barrier
 - B. a connector to solar radiation
 - C. a filter for wind
 - D. all of the above
20. Architects and designers have the most control and flexibility in
- A. the sky layer
 - B. the near surface layer
 - C. the surface layer
 - D. the sub-surface layer
21. Expedient transportation is a characteristic of the
- A. the sky layer
 - B. the near surface and sub-surface layers
 - C. the surface layer
 - D. all of the above
22. In a temperate climate, a fully-occupied office building located in the city center benefits from the city effect
- A. all year
 - B. only during the summer
 - C. during the day
 - D. none of the above
23. A parking garage 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 52°F during the daytime,
- it will have to be heated during the winter in Montana
 - it can be characterized as being skin dominated load (SDL)
 - solar heating is a viable passive strategy
 - all of the above
25. A composite wall made up of three materials with conductances (C) of 2, 0.2, and .02 respectively has an R-Value of about
- 2.22
 - 0.45
 - 55.5
 - given only C-values, you can't calculate R-value
26. An energy conserving building is most likely to be successful if
- each orientation is a separate thermal zone
 - the number of thermal zones is minimized
 - thermal zones are limited to single floors
 - all of the above
27. In order for two rooms to be in the same thermal zone they must
- be adjacent
 - have similar internal loads
 - have the same aperture orientations
 - all of the above
28. An insulated wall is superior to an uninsulated wall because
- it reduces heat transfer through the building skin
 - it increases comfort by providing radiant temperatures near room air temperature
 - it moves the winter dew point further into the wall
 - all of the above



29. A skytherm (roof pond) is classified as
- A. a direct gain passive heating system/indirect loss passive cooling system
 - B. an indirect gain passive heating system/indirect loss passive cooling system
 - C. an isolated gain passive heating system/isolated loss passive cooling system
 - D. an indirect gain passive heating system/direct loss passive cooling system
30. By integrating passive strategies into the schematic design, you can
- A. attain 80% of the building's potential energy savings
 - B. always avoid installing a furnace
 - C. use daylight to replace all electric lights
 - D. all of the above