Arch 463
ECS
Fall 2017 Name_____

FINAL

40 Multiple Choice Questions

Part 1—Review Questions on material covered in Midterms I & II

1. My dining room window in Moscow faces due north. What is the first day next year that the sun will peek into my window (assuming it's clear at sunrise)?
   A. never
   B. June 21
   C. May 15
   D. the morning after the spring equinox

2. If you are slowly losing heat to the environment,
   A. you will die
   B. you will suffer hypothermia
   C. you will be comfortable if your metabolic rate equals the rate of loss
   D. you will require mechanical heating to achieve comfort

3. In Norberg-Schultz's terminology an operable window can serve as a
   A. connector
   B. barrier
   C. switch
   D. all of the above

4. To model building performance for future climates (e.g., 2020, 2050, & 2080) you could use
   A. SBEED
   B. Sefaira
   C. Climate Consultant
   D. all of the above

5. One-day site visits are best for
   A. determining prevailing wind direction
   B. identifying microclimatic differences
   C. determining site shading patterns
   D. all of the above

6. The city effect is caused by
   A. daylighting
   B. waste heat from buildings and transit
   C. green roofs
   D. none of the above

7. Which of the following cause both heating and cooling loads through the building envelope?
   A. solar radiation
   B. infiltration
   C. conduction
   D. all of the above

8. To meet the Architecture 2030 Challenge, a building to be built this year must
   A. be carbon neutral
   B. consume no more than 10% of fossil fuel-generated energy of an average building of its type
   C. consume no more than 30% of fossil fuel-generated energy of an average building of its type
   D. consume no more than 50% of fossil fuel-generated energy of an average building of its type

9. For a high performance daylighted office building you would choose commercial low-E glazing over reflective bronze double pane glazing because commercial low-E
   A. allows more daylight
   B. affords less dismal exterior views
   C. rejects more solar gain
   D. all of the above

10. The composite R-value of a wall with R-30 insulation, R-6 windows, and an R-3 door is
   A. R-39
   B. the weighted average by area of all the components
   C. R-13
   D. R-3

11. The east-facing curtain wall of the East Addition to the Kibbie Dome could be improved by making it a double skin facade because
    A. the existing interior blind shading strategy allows heat to enter the building
    B. natural ventilation could be used when appropriate
    C. both heating and cooling performance would be improved
    D. all of the above

12. When a building's balance point temperature is higher than the outdoor temperature
    A. the building requires heating to maintain comfort
    B. neither heating nor cooling is required for comfort
    C. the building requires cooling to maintain comfort
    D. none of the above

13. A courtyard in a clear dry climate can be a powerful cooling agent for its surrounding building if
    A. shading is provided by a central tree
    B. evaporation is provided by a fountain
    C. radiation to the clear night sky is unobstructed
    D. all of the above are equally important

14. HEED modeling of passive performance of the Brillhart House showed that shifting the elongated axis from N-S to E-W would
    A. greatly improve passive performance
    B. reduce the average high indoor temperature in the summer
    C. make winter indoor temperatures much higher
    D. none of the above

15. Earthships designed by Michael Reynolds feature
    A. passive solar heating
    B. solar composting toilets
    C. on-site energy generation
    D. all of the above

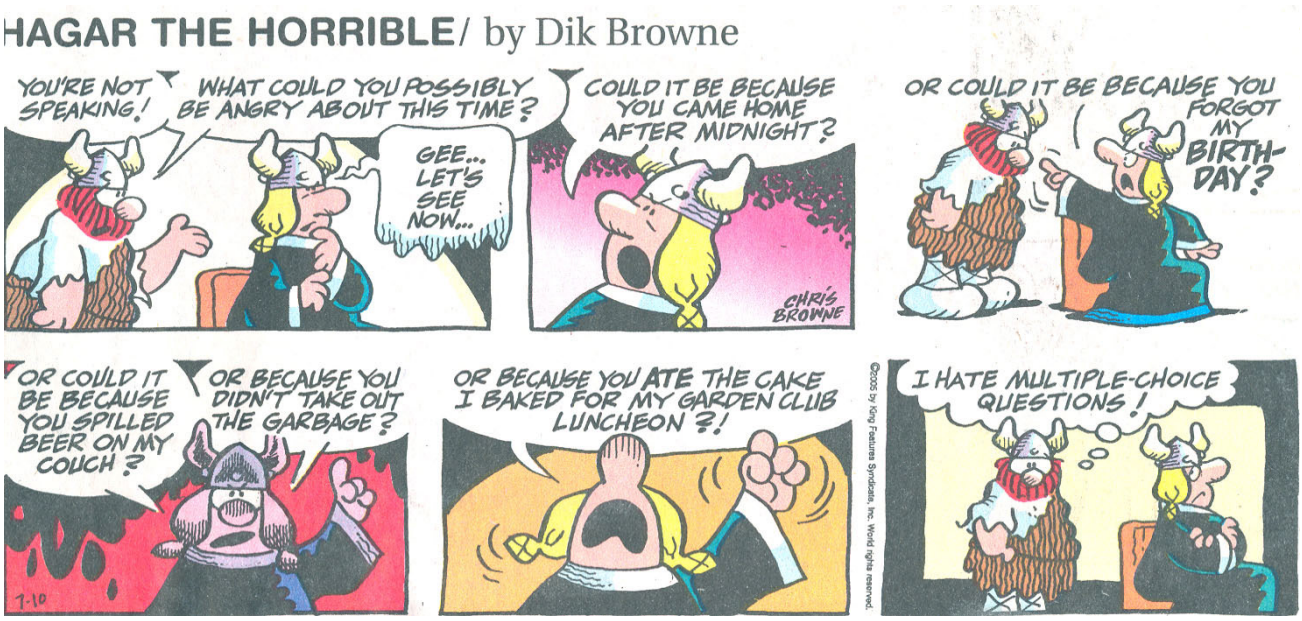
16. The shading strategy for Rogers' Chiswick Park development
    A. is uniform on all 12 buildings
    B. differs with facade orientation
    C. integrates electricity generation
    D. all of the above

17. The active solar collectors whose efficiency is least affected by cloudy skies are
    A. concentrating collectors
    B. amorphous flat plate collectors
    C. evacuated tube collectors
    D. all of the above are equally affected

18. The common feature of active systems in the Mayhew house and the Bevans house is
    A. air collectors
    B. thermal mass heat storage
    C. radiant heating
    D. none of the above

19. A double-duct HVAC system is similar to an active solar heating system in that
    A. it may deliver heat by air or water
    B. it requires locally introduced fresh air
    C. heating and cooling may be delivered simultaneously
    D. none of the above

20. Roof-top PVs are used to generate electricity and achieve carbon neutrality at
    A. the Crystal in London
    B. NASA Sustainability Base
    C. the California Academy of Sciences
    D. none of the above



Part 2—Questions on New Material

21. Hopkins' Inland Revenue Project in Nottingham demonstrates that stack ventilation
    A. can be integrated with vertical circulation
    B. can be improved by solar gains
    C. can provide an aesthetic statement
    D. all of the above

22. Skyscrapers require mechanical floors
    A. every ten floors
    B. about one every 20 floors
    C. about one every 30 floors
    D. about one every 50 floors

23. The building that demonstrates prominent display of its mechanical systems is
    A. the Pompidou Center in Paris
    B. Lloyd's of London
    C. Richards Laboratories in Philadelphia
    D. all of the above

24. Arup Campus in Solihul features
    A. BMS managed shading devices
    B. manual operable shading devices
    C. combined daylight and ventilation cowls
    D. all of the above

25. Before Arup Campus was constructed physical models were constructed to test
    A. daylighting strategies
    B. natural ventilation strategies
    C. both of the above
    D. none of the above

26. A green wall inside a conference room is valuable in that it can
    A. create oxygen
    B. reduce carbon dioxide
    C. remove targeted pollutants
    D. all of the above

27. Contributors to poor indoor air quality include
    A. off-gassing from building contents
    B. radon gas
    C. poor humidity control
    D. all of the above

28. High indoor air quality is important because
    A. it contributes to enhanced worker productivity
    B. we spend on average 70% of our time indoors
    C. it earns multiple LEED points
    D. all of the above

29. A compression cooling system when coupled with ground coils
    A. is more efficient than air-coupled systems
    B. can also provide heating
    C. both of the above
    D. none of the above

30. The simple hygroscopic principal that drives absorption cooling
    A. provides near-passive cooling
    B. can only be accomplished with solar thermal heating panels
    C. is complicated by the need to sustain system equilibrium
    D. none of the above

31. The best approach to creating intelligent buildings is
    A. Japanese
    B. European
    C. British or American
    D. any combination of the above

32. The Chesapeake Bay Foundation HQ near Annapolis is a great example of integrated design because
    A. it achieved LEED Gold
    B. its PV array makes it carbon-neutral
    C. all passive and active systems were considered early in the design process
    D. all of the above

33. Besides heating, cooling, lighting, and ventilation the Chesapeake Bay Foundation HQ features other successful sustainable strategies including
    A. composting toilets
    B. choosing mostly local, recyclable, and low embodied energy building materials
    C. rainwater collection and use
    D. all of the above

34. Britain has produced exemplary green buildings for decades because of
    A. pressure from Europe's green parties
    B. signing and acting on the Kyoto Accord
    C. European Union building regulations
    D. all of the above

35. Which of these British green buildings generates no on-site energy?
    A. The Crystal
    B. Scottish Parliament
    C. John Hope Gateway
    D. London City Hall

36. London City Hall has many green features, therefore
    A. it is an exemplary green building
    B. its Energy Performance Certificate shows a superior rating
    C. it is beautiful
    D. none of the above

37. Funiculars are
    A. always energy intensive
    B. only used in urban settings
    C. similar to the Falkirk Wheel
    D. none of the above

38. Which of the following elevator types is most commonly used during high-rise building construction
    A. traction
    B. hydraulic
    C. rack and pinion
    D. all of the above

39. Post occupancy evaluation (POE) is most effective
    A. before commissioning
    B. just after commissioning
    C. about 1 year after occupancy begins
    D. when done periodically over the life-span of the building

40. POE is solely reliant on
    A. energy use metrics from bills or meters
    B. on-site measurements
    C. occupant surveys
    D. none of the above

Done now! Have a happy and restful holiday!