

Arch 464
ECS
Final Exam
Spring 2002

40 Prime Choice Questions—Select the best answer for each one

New Questions



1. In the cartoon above, Rose's words have a hollow ring because
 - A. sound travels more quickly in stone than in air
 - B. the deep well has a long reverberation time
 - C. there is little background noise in the well
 - D. all of the above
2. Given that the speed of sound is 770 mph (1130 feet/second) at sea level, a 1,500 hertz tuning fork has a wave length
 - A. of about 6 inches
 - B. of about 3/4 of an inch
 - C. of about 9 inches
 - D. that is indeterminate because there are no pure tones
3. A silent technician measuring the sound level in a electrically illuminated interior office on the 23rd story of a 60-story high rise, will detect
 - A. about zero decibels
 - B. about 20 dB
 - C. about 40 dB
 - D. over 60 dB
4. Three vibraphone players doinking away at 55 dB each combine to form music at about
 - A. 55 dB
 - B. 58 dB
 - C. 60 dB
 - D. 165 dB

5. On a windless day your golf partner, 30 feet away hears your cry of "fore!" as an 80 dB sound. The potential victim of your golfing indiscretion, 160 yards away across deep grassy rough, hears it as

- A. an 80 dB sound
- B. a 68 dB sound
- C. a 66 dB sound
- D. a 56 dB sound

6. A library reading room

- A. should have high T_R
- B. is a quiet goal space
- C. is a silence goal space
- D. requires white noise

7. What is the reverberation time of Rose's 30 foot deep well of resentment (occupied by one person, 4 sqft, $\alpha = 0.96$) with a 6 foot radius sand floor ($\alpha = 0.30$), 30 foot rock walls ($\alpha = 0.05$), and an open ceiling?

- A. 8 seconds
- B. 1.76 seconds
- C. 1.97 seconds
- D. 0.8 seconds

8. You're convinced that Mel Gibson is speaking to you at the cinema because

- A. the speaker is mounted right behind the screen
- B. your sense of sight prevails over your sense of hearing
- C. Gibson is a talented actor
- D. you're totally delusional

9. Antoine Predock's heart clinic in Albuquerque successfully mitigates the sound of the adjacent freeway off-ramp by

- A. being earth-sheltered
- B. erecting a barrier wall with small openings paralleling the off-ramp
- C. providing a wide swath of trees between it and the freeway
- D. all of the above

10. An auditorium located in a basement space adjacent to a subway can be acoustically isolated from the subway by

- A. spring mounting the entire room as you would a noisy piece of equipment
- B. using a waterfall to mask the subway noise
- C. encasing the room in a kryptonite barrier
- D. using sound absorbing sonex paneling as the interior wall finish

11. To site a building in a suitable acoustic environment, the architect must understand how the proposed rural site is influenced by
 - A. sound propagation in a free field
 - B. reverberation time
 - C. sound propagation in building materials
 - D. all of the above

12. An urban pocket park can be acoustically designed similar to
 - A. a rural outdoor space
 - B. a noisy office space
 - C. a concert hall
 - D. a medieval cathedral

13. Carnegie Hall's latest remodel
 - A. eliminated deep balcony seating to provide each seat with fine sound
 - B. removed a concrete slab beneath the stage, the mysterious result of an earlier remodel
 - C. reupholstered the seats in crushed red velvet
 - D. all of the above

14. Atlanta's Mayor Bob Carr Auditorium, built in the 50s, was
 - A. the first hall since Boston's Symphony Hall to employ the classic shoebox shape
 - B. effectively remodeled for improved acoustics for the symphony during the 70s
 - C. converted into a wide hall, requiring electronic enhancement to achieve excellent sound
 - D. the first hall to use 1:10 scale models for acoustic design

15. Boston's Symphony Hall is acoustically successful because
 - A. its reflective surfaces are rich in architectural detail
 - B. its reverberation time is appropriate for symphonic performance
 - C. its designers employed an acoustic consultant, Wallace Sabine
 - D. all of the above

16. In a wide hall without electronically enhanced acoustics, the best seat, acoustically, is probably
 - A. near a side wall
 - B. in the third row in the center of the hall
 - C. beneath the balcony
 - D. in the center of the balcony near the back wall

17. A laser light source and a cardboard and foil $\frac{1}{4}'' = 1' - 0''$ scale model can best help you design a space for
 - A. office work
 - B. woodwind quintet performances
 - C. retail sales
 - D. all of the above

18. To mitigate the pre-class cacophony in a small reverberant classroom you can
- A. add acoustically absorptive material to the ceiling
 - B. design the side walls to be non-parallel
 - C. design the back wall to be concave
 - D. all of the above
19. The space in the Music and Architecture CD that was designed for long reverberation times is
- A. the Greek amphitheater
 - B. the Taj Mahal
 - C. the Globe theatre
 - D. all of the above
20. The Music and Architecture piece written to exploit the variable acoustics of concave and convex reflective surfaces is
- A. Pilgrims' song from "Libre Vermell"
 - B. Dufay's Motet for Six Voices
 - C. Wagner's Parsifal
 - D. Varèse's Poème Électronique

Review Questions

21. Green architecture is most closely related to
- A. code-compliant architecture
 - B. sustainable architecture
 - C. regenerative architecture
 - D. none of the above
22. All new construction for the city's public buildings must be LEED-certified in
- A. Portland, OR
 - B. Seattle, WA
 - C. Washington, DC
 - D. all of the above
23. Computer-aided advice for sustainable architecture can be obtained by using
- A. the LEED certification program
 - B. the Green Building Advisor
 - C. Malcolm Well's checklist
 - D. all of the above
24. A one square foot surface placed 2 feet from a one candlepower light source will receive
- A. 12.57 footcandles
 - B. 1 footcandle
 - C. 3.14 footcandles
 - D. $\frac{1}{4}$ footcandle

25. To eliminate glare in a room, the daylighting designer should strive to
- eliminate the sun component
 - maximize the externally reflected component
 - minimize the internally reflected component
 - all of the above
26. A room with windows on two walls will be glare free, especially if
- the walls are painted a dark color
 - the walls are painted a light pastel
 - the window surrounds are knife-edged
 - a shallow-welled skylight is also present
27. Lumen-Micro's strength as a daylighting design tool is that it can
- model complex geometries early in the design process
 - quickly model simple rooms under a variety of sky conditions
 - easily model light shelves and brise soliels
 - all of the above
28. A T-5 fluorescent lamp can provide high quality illumination at a lower price than a tri-phosphor T-12 fluorescent lamp because
- it has less surface area
 - it uses different phosphors
 - it can be mass produced
 - all of the above
29. The depressed incandescent lamp pictured in the cartoon is currently being effectively replaced by
- CFLs with magnetic ballasts
 - T-8 fluorescent lamps
 - CFLs with electronic ballasts
 - all of the above
30. In theory the luminous ceiling in McClure 209 provides
- each desk with equal illumination
 - more illumination to those in the last row
 - perfect illumination for glare-free reading
 - high quality color rendering



31. An energy saving device that costs \$500, has a 10-year life, requires no maintenance or replacement parts, and saves \$45 in electricity each year

- A. is a bad investment
- B. has a payback time longer than 10 years
- C. will be cost effective if energy prices rise with inflation
- D. requires life cycle cost analysis to determine its fiscal impact

32. A heat pump can achieve a first law efficiency of 300% by

- A. operating in off-peak hours
- B. using high grade btus to "round up" low grade btus
- C. recycling the same fluid constantly
- D. all of the above

33. The SUVs suckling in the cartoon depict a

- A. an ironic stance while striving for energy independence
- B. the political cost of petroleum-based fuels
- C. an insensitivity of prices to future scarcity
- D. all of the above



34. Building integrated PVs offer the advantage of

- A. designing a building enclosure and electricity source simultaneously
- B. providing energy efficient domestic hot water and space heating
- C. twenty-four hour a day electricity production
- D. all of the above

35. The most cost-effective method of extending the capabilities of a local electric utility is to

- A. build new wind turbine generators
- B. build new gas-fired electrical generators
- C. implement energy conservation strategies in its entire service area
- D. build new nuclear power plants

36. The landscape at the Miller-Hull-designed Water Pollution Control Lab in Portland, OR is designed to

- A. control parking lot run-off
- B. control neighborhood storm water run-off
- C. control run-off from the building's roof
- D. all of the above

37. The probable source of the water for towers like the one pictured in the cartoon is

- A. a regional reservoir
- B. the local aquifer
- C. an alien colony
- D. all of the above

38. For a building that collects rainfall for domestic use, an ideal roofing material is

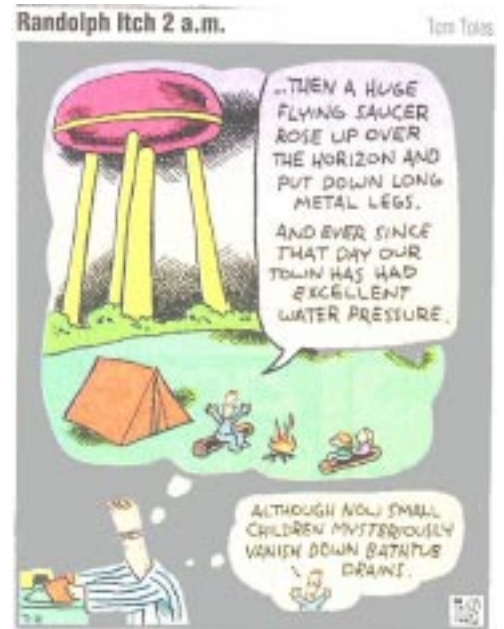
- A. cedar shakes
- B. building integrated photovoltaics
- C. asphalt composite shingles
- D. all of the above

39. Stream restoration projects like the Paradise Creek project

- A. reduce the frequency and severity of floods
- B. reduce pollution and sedimentation in the stream
- C. improve the wildlife habitat
- D. all of the above

40. Mallard Fillmore's plumber friend in the cartoon

- A. accurately states the problem with 1.6 gallon/flush toilets
- B. exaggerates the problem of flushing difficult feces
- C. justifies buying black market toilets from Canada
- D. all of the above



Mallard Fillmore

By Bruce Tinsley



Catch some rays, catch some Zzzzzzzzzs, catch some horsehide on the admin lawn!
Come back with new energy next fall!