



Public Health Training Network

Lesson 11

SELF-STUDY COURSE 3010-G

The Residential and Institutional Environment



Environmental Health Sciences
Self-Study Course SS3010

Lesson 11: *The Residential and Institutional Environment*

I. Lesson 11 Consists of the Following

- A. Part I: 15 multiple choice questions
- B. Part II: 25 multiple choice questions
- C. Part III: 25 multiple choice questions

II. References

- A. Salvato, J. A. *Environmental Engineering and Sanitation*. 4th ed. New York: John Wiley & Sons, 1992.
- B. Salvato, J. A. and J. E. Beck, *Environmental Engineering and Sanitation: 1994 Supplement - New Tools for the Environmental Engineer/Specialist*. New York: John Wiley & Sons, 1994.
- C. Richmond, J. Y. and R. W. McKinney, editors. *Biosafety in Microbiological and Biomedical Laboratories*. 3rd edition. U.S.HHS/CDC/NIH, U.S. Govt. Printing Office, Washington DC, 1993.

III. Topics and Reading Assignments

- 1. Chapter 11 - The Residential and Environmental Engineering Institutional Environment and Sanitation, *Environmental Engineering and Sanitation*. 1992. (Page No.)
 - A. Substandard Housing and Its Effects 1160 to 1168
 - B. Appraisal of Quality of Living 1168 to 1180
 - C. Housing Program 1180 to 1190
 - D. Housing Form Paragraphs for Letters 1191 to 1204
 - E. Plumbing 1204 to 1206
 - F. Indoor Air Quality 1213 to 1230
 - G. Mobile Home Parks 1230 to 1232
 - H. Institution Sanitation 1232 to 1246
- 2. Chapter 5 - Salvato, J. A. and J. E. Beck, *Environmental Engineering and Sanitation: 1994 Supplement - New Tools for the Environmental Engineer/Specialist*, 1994.

Engineer/Specialist, 1994.

3. *Infant Mortality--United States 1990 and State Activities for Prevention of Lead Poisoning Among Children--United States, 1992* MMWR, March 12, 1993 Vol. 42/ No. 9; **copy included at end of lesson.** 4 pages

IV. Recommended Readings

ASHRAE Guide and Data Book: 1970 systems vol. New York: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 1970.

The BOCA Building Code/1986. Chicago: Building Officials and Code Administrators, Inc., 1986.

Bond, R. G., Michaelson, G. S., DeRoos, R. L. eds. *Environmental Health and Safety in Health-Care Facilities.* New York: MacMillan, 1973.

Dubler, N. N. ed. *Standards for Health Services in Correctional Institutions.* Washington, D.C.: American Public Health Association, 1986.

Dux, J.P., Stalzer, R.F., *Managing Safety in the Chemical Laboratory.* Van Nostrand Reinhold, New York, 1988. ISBN: 0-442-21869-9.

Hoover, R. L., et al. *Health Safety and Environmental Control.* Van Nostrand Reinhold, New York, 1989. ISBN: 0-442-20589-9.

Koren, H. *Handbook of Environmental Health and Safety.* Vols. 1 & 2. New York: Pergamon Press, 1991.

Lunn, G., Sansone, E.B. *Destruction of Hazardous Chemicals in the Laboratory.* John Wiley and Sons, New York, 1990. ISBN: 0-471-51063-7.

Mood, E. W. *Housing and Health, APHA-CDC Recommended Minimum Housing Standards.* Washington, DC: American Public Health Association, 1986.

National Electrical Code Handbook. 3rd ed. Massachusetts: National Fire Protection Association, 1984.

National Plumbing Code. New York: ASME, L-00010.

Morbidity and Mortality Weekly Report (MMWR), 1993 issues, U.S.HHS/CDC

References of Historical Significance

Bond, R. G., Michaelson, G. S., DeRoos, R. L. eds. *Environmental Health and Safety in Health-Care Facilities*. New York: MacMillan, 1973.

V. Objectives

Upon successful completion of Lesson 11, students should be able to

- to to to to to demonstrate an understanding of the American Public Health Association model method of evaluating housing
- housing recognize the basics involved in conducting inspections and enforcement actions as they relate to housing and institutions
- recognize the difference between housing and building codes and the difference in the respective approaches of compliance programs
- demonstrate understanding of the causes and solutions to indoor air quality issues
- demonstrate an understanding of institutional environmental health concerns
- demonstrate an understanding of biohazard safety issues.

**Environmental Health Sciences
Self-Study Course SS3010**

Lesson 11: *The Residential and Institutional Environment*

Part I: Multiple Choice - APHA Evaluation

1. In the APHA method of measuring housing quality, which of the following would be considered a minor deficiency if found inadequate?
 - a. central heating
 - b. water supply located outside of living unit
 - c. lack of windows to the outside
 - d. minimum of two exits in case of fire.
2. A minimum of _____ of sleeping area per person is required in the APHA appraisal method.
 - a. 10 ft²
 - b. 20 ft²
 - c. 40 ft²
 - d. 60 ft².
3. In the APHA-PHS Recommended Housing Maintenance and Occupancy Ordinance, the responsibility of storing and disposing of all rubbish is assigned to the
 - a. owner
 - b. occupant
 - c. landlord
 - d. owner and occupant jointly.
4. The ASHRAE recommended minimal thermal standard for dwellings is _____ F at 40% humidity and an air circulation rate of 45 fpm.
 - a. 57°F
 - b. 60°F
 - c. 68°F
 - d. 76°F.

Environmental Health Sciences

5. Minimum APHA/PHS standards for housing include
 - a. running water piped in
 - b. 50 square feet of parking per unit
 - c. an air conditioner in each unit in tropical areas
 - d. a dehumidifier in each unit.
6. In unsewered areas, the responsibility for water and sewer for new subdivisions is assigned to the
 - a. local department of public works
 - b. local government
 - c. new owners
 - d. developer.
7. Cross-connection controls include air gaps, backflow preventers, vacuum breakers and
 - a. gate valves
 - b. indirect waste piping
 - c. air vents
 - d. water meters.
8. The waste-discharge pipe from any appliance directly connected to the potable water system should terminate at least _____ above the rim of a or receptacle directly connected to the drainage system.
 - a. 2 inches
 - b. 4 inches
 - c. 5 inches
 - d. 6 inches.
9. The drain line of an ice machine should connect to the sewer system through
 - a. a grease trap
 - b. a direct connection below floor level
 - c. an open receptacle with an air gap
 - d. a backflow preventer properly vented.

10. The air gap between the end of the faucet and the overflow rim of the sink should be _____ times the diameter of the supply pipe.
- a. 1 1/2
 - b. 2
 - c. 3
 - d. 4.
11. Excessive condensation, corrosion, and mildew occur when the relative humidity exceeds
- a. 20 percent
 - b. 40 percent
 - c. 80 percent
 - d. 60 percent.
12. Vent gases combined with high moisture inside a chimney will form
- a. a glass-like glaze
 - b. hydrochloric acid
 - c. sodium chloride
 - d. sulfuric acid.
13. Nosocomial infections are a recurring problem in
- a. food establishments
 - b. hospitals
 - c. swimming pools
 - d. health spas.
14. Minimum wash water temperature in a hospital laundry is
- a. 146 to 150°F.
 - b. 160 to 167°F
 - c. 170 to 178°F
 - d. 185 to 196°F.

Environmental Health Sciences

15. It is recommended that a minimum of one water closet be provided for each _____ beds in a hospital or nursing home.
- a. two
 - b. four
 - c. six
 - d. eight.

Part II: Multiple Choice - Basic Housing

1. The housing code, regardless of who promulgates it, is (answer found in chapter 2)
 - a. a complex environmental health code requiring the involvement of environmental health scientists and sanitarians
 - b. best left in building and housing departments not associated with the management of environmental health and protection issues
 - c. not a good utilization of the expertise of the environmental health professional
 - d. a program that does not require refined management skills.

2. Lead levels exceeded 10ug/dL in ____ U.S. children aged 6 and under in 1990. (answer found in MMWR March 12, 1993, Vol. 42/No. 9)
 - a. 300,000
 - b. 3,000
 - c. 1,000,000
 - d. 3,000,000.

3. Utilization of _____ will save the agency time and expense through the avoidance of extensive court time and to demonstrate that the agency uses legal action only as a measure of last resort.
 - a. informal and formal hearings
 - b. fines and tickets
 - c. condemnation
 - d. targeting low income areas for inspection.

4. In children, blood lead levels (BLLs) more than ____ are associated with decreased intellectual performance and other adverse health events.
 - a. 2 ppm
 - b. 5 $\mu\text{g/l}$
 - c. 10 $\mu\text{g/l}$
 - d. 15 ppm.

5. Lead poisoning is commonly associated with children living in homes built before
 - a. 1980
 - b. 1970
 - c. 1950
 - d. 1940.

6. Most urban dwellers spend what percent of their total time indoors
 - a. 10 to 20 percent
 - b. 25 to 50 percent
 - c. 80 to 90 percent
 - d. 70 to 80 percent.

7. Which of the following is the primary cause of indoor air quality problems?
 - a. inadequate ventilation
 - b. contaminated outside air
 - c. radon
 - d. ragweed.

8. CDC advocates a multitiered approach for environmental management of lead threats. This approach has which of the following steps
 - a. investigation and reduction of hazards
 - b. near universal screening
 - c. identification and remediation of hazards
 - d. all of the above.

9. Radon is detected in a home through the use of instrumentation that measures
 - a. geiger rays
 - b. beta particles
 - c. alpha particles
 - d. UV rays.

Environmental Health Sciences

10. The major potential entry sources of radon are
- a. cracks in concrete floors
 - b. floor drains
 - c. drainage sumps
 - d. all of the above.
11. Radon can not be reduced with which of the following devices
- a. humidifier
 - b. electrostatic precipitators
 - c. ionizers
 - d. none of the above.
12. The best control of formaldehyde air pollution in the home is
- a. avoidance of the use of formaldehyde containing products
 - b. the coating and sealing of materials containing formaldehyde
 - c. increasing the amount of outside air
 - d. all of the above.
13. Short term exposure to formaldehyde levels above _____ can cause serious health or life threatening reactions
- a. 50 ppm
 - b. 20 ppm
 - c. 10 ppm
 - d. 0.5 ppm.
14. Exposure to formaldehyde can cause
- a. irritation to the respiratory passages
 - b. contact dermatitis
 - c. disturbed sleep
 - d. all of the above.

15. If radon is a problem in your area the following locations would be rooms of higher risk:
- a. areas with showers and flood drains
 - b. basements
 - c. washrooms
 - d. all of the above.
16. Office space should provide at least ____ per min per occupant of clean outside air at minimum where smoking is not prohibited.
- a. 5 ft³
 - b. 10 ft³
 - c. 20 ft³
 - d. 30 ft.
17. To prevent chimney backdrafts, the chimney must be constructed ____ inches above the highest point of the roof at a minimum.
- a. 4 inches
 - b. 8 inches
 - c. 24 inches
 - d. 48 inches.
18. The high moisture content of vent gases create
- a. acids which eat away at the mortar in the chimney
 - b. C₂H₂O
 - c. possible explosion hazard due to combustible gas
 - d. all of the above.
19. The number of mobile home units in the United States
- a. was 2.9 M in 1970
 - b. was 3.9 M in 1980
 - c. was 5.2 M in 1987
 - d. all of the above.

20. Most mobile homes are
- a. occupied by the owners
 - b. 33 percent are 65 years old or older
 - c. 33 percent are 35 years old or younger
 - d. all of the above.
21. Mobile homes have been in general production since
- a. 1943
 - b. 1954
 - c. 1965
 - d. 1970.
22. The reasons for nosocomial infections in hospitals, and nursing homes are
- a. older patients with chronic diseases
 - b. increased numbers of high risk patients
 - c. invasive procedures
 - d. all of the above.
23. Which of the following are not typically members of the infection control committee
- a. hospital CEO
 - b. environmental control officer
 - c. infection control nurse
 - d. a physician representative.
24. Which or the following are the most frequent disease transmission routes in child day care centers?
- a. respiratory
 - b. fecal oral route
 - c. intimate contact
 - d. all of the above.

25. Individuals assigned to regulatory programs should be
- a. exceptionally qualified by both training and experience
 - b. have degrees in institutional control
 - c. have achieved appropriate certifications
 - d. a and c.

**Part III: Biohazard, Questions Taken from Chapter 5, 1994 Supplement,
Multiple Choice**

- 1. A biohazard is
 - a. any material that negatively impacts a biological organism
 - b. a material of biological composition, especially if infective, that constitutes a threat to man or his environment
 - c. a chemical that constitutes a threat to man or his environment
 - d. any virus that causes fatal disease.
2. The control of bloodborne pathogens is regulated by
 - a. OSHA
 - b. USDA
 - c. NIH
 - d. CDC.
3. Muerto Canyon virus (MCV) is a Hantavirus mainly carried by
 - a. woodchucks
 - b. beavers
 - c. deer mice
 - d. skunks.
4. The Muerto Canyon virus causes disease of the _____ in humans.
 - a. lungs
 - b. kidneys
 - c. intestine
 - d. brain.

Environmental Health Sciences

5. The incidence of tuberculosis in English laboratory workers working with *M. tuberculosis* was reported to be _____ higher than for the general population.
- a. 2 times
 - b. 3 times
 - c. 5 times
 - d. 10 times.
6. Universal precautions refer to
- a. specific respiratory protection used in hospitals
 - b. an infection control measure in which all human blood and certain body fluids are treated as infectious
 - c. procedures used when handling hazardous wastes
 - d. none of the above.
7. The biosafety containment level suitable for work involving agents of moderate potential hazard to personnel and the environment is
- a. biosafety level 1
 - b. biosafety level 2
 - c. biosafety level 3
 - d. biosafety level 4.
8. The term containment is used in describing
- a. control of infectious wastes in the laboratory
 - b. a biosafety cabinet
 - c. safe methods for managing infectious agents in the laboratory
 - d. facilities designed for research on recombinant DNA.
9. Biological safety equipment includes
- a. biosafety cabinets
 - b. needles and syringes
 - c. personal protective equipment
 - d. a and c.

Environmental Health Sciences

10. The four biosafety containment levels consist of a combination of
- laboratory practices, safety equipment, and facilities
 - laboratory techniques, research protocols, and safety equipment
 - research protocols, safety training, and laboratory facilities
 - laboratory practices, safety training, and research protocols.
11. The protection of personnel and the immediate laboratory environment from exposure to infectious agents by good microbiological technique and safety equipment is called
- primary containment
 - secondary containment
 - tertiary containment
 - none of the above.
12. *Campylobacter* (*C. jejuni*/*C. coli*, *C. fetus* subsp. *fetus*) may be safely used in the laboratory as a minimum at
- biosafety level 1
 - biosafety level 2
 - biosafety level 3
 - biosafety level 4.
13. The release of genetically engineered materials to the environment is regulated by
- USDA and EPA
 - NIH and CDC
 - EPA and AEC
 - FDA and PHS.
14. The Medical Waste Tracking Act of 1988 required _____ to establish a two year demonstration program for tracking medical waste in selected states
- CDC
 - USDA/APHIS
 - EPA
 - none of the above.

15. Those laboratory activities that may result in personnel exposure to aerosols may result in
- a. CDC investigating
 - b. increased containment
 - c. the appointment of a biosafety officer
 - d. none of the above.
16. A class II biological safety cabinet (BSC) is designed to protect
- a. the work being done in the BSC
 - b. the personnel using the BSC
 - c. the environment
 - d. all of the above.
17. Biological safety cabinets should be performance tested every
- a. 1 year
 - b. 1 month
 - c. 2 years
 - d. 10 years.
18. A national performance standard has been developed by
- a. NSF
 - b. NSC
 - c. NIH
 - d. ABSA.
19. The development and maintenance of an exposure control plan is one requirement of
- a. EPA's biomedical waste regulations
 - b. OSHA's bloodborne pathogens regulations
 - c. USDA/APHIS plant genetics regulations
 - d. FIFRA.

Environmental Health Sciences

20. A clean bench should be considered for use
- a. as an alternative for a biosafety cabinet
 - b. as an alternative for a fume hood
 - c. only when there is no possible risk to personnel
 - d. when protecting the laboratory environment.
21. Perhaps the most important feature in implementing programs in biosafety is
- a. the extensive use of rules and regulations
 - b. the reliance on outside contractors
 - c. working with the client in a consultative mode
 - d. none of the above.
22. The implementation of a biosafety program begins with
- a. an assessment of risk
 - b. the development of a biosafety manual
 - c. training the laboratory personnel
 - d. consultation with CDC and NIH.
23. *Herpesvirus simiae* (B-virus) is naturally occurring in certain species of monkeys namely the macaque. The highest risk of humans acquiring this virus is from
- a. primary cell cultures
 - b. the bite of a macaque
 - c. aerosol exposure to saliva and urine
 - d. mouth pipetting in the laboratory.
24. Laboratories working with infectious agents have been shown to
- a. represent no threat to the community
 - b. represent a real and continuous threat to the community
 - c. represent a growing danger to the environment
 - d. none of the above.

Environmental Health Sciences

25. The appointment and maintenance of an Institutional Biosafety Committee (IBC) is one of the requirements of
- a. EPA
 - b. CDC
 - c. NIH
 - d. FDA.

SELF-STUDY COURSE 3010-G



Answer Keys



Self-Study Course SS3010
Environmental Health Sciences
Answer Keys (Page No.)

Lesson 11: Part I

1. A (1169)	4. D (1223)	7. B (1212)	10. B (1209)	13. B (1233)
2. C (1170)	5. A (1170)	8. A (1182)	11. D (1223)	14. B (1237)
3. D (1168)	6. D (1182)	9. C (1213)	12. D (1228)	15. D (1207)

Part II

1. A (160 chl)	6. C (1214)	11. D (1217)	16. C (1222)	21. B (1231)
2. D (MMWR)	7. A (1214)	12. D (1221)	17. C (1229)	22. D (1233)
3. A (1193)	8. D (1291)	13. A (1221)	18. A (1229)	23. A (1234)
4. C (MMWR)	9. C (1218)	14. D (1221)	19. D (1231)	24. D (1246)
5. C (109 chl)	10. D (1219)	15. D (1219)	20. D (1231)	25. D (1246)

Part III

1. B (47)	6. B (49)	11. A (6)	16. D (54)	21. C (56)
2. A (49)	7. B (50)	12. B (50\87)	17. A (55)	22. A (50)
3. C (42\26)	8. C (51)	13. A (49)	18. A (49)	23. B (108)
4. A (42\22)	9. D (7)	14. C (49)	19. B (49)	24. A (2\3)
5. C (2)	10. A (51)	15. B (50)	20. C (54)	25. C (56)