Study Guide

The Study Guide is comprised of 17 Lessons, all covering subject matter found in **"Principles of Food Sanitation" by Norman Marriott and Robert Gravani**, in the three volume ñEnvironmental Engineeringò set, which includes;

ñPrevention and Response to Water, Food, Soil and Airborne Disease and Illnessò

ñWater and Wastewater, Soil and Groundwater Treatment and Remediationò

ñEnvironmental Health & Safety for Municipal Infrastructure, Land Use, &Planningò

And the Pool and Spa Operators Manual

Tips To Pass the R.S. Exam

The exam is comprised of 135 questions in Part I and 135 questions in Part 2 for a total of 270 questions. All questions have been constructed from questions in the lessons you will complete. By answering all questions in these 17 lessons at least one month prior to taking the exam and then reviewing the completed lessons during the two to three weeks leading up to the exam, your chances of having a passing score will be greatly improved. Trying to pull all nighters like we did in College or cramming in the days just prior to taking the exam will likely be unsuccessful. A steady pace with time to review is recommended. The lessons will lead one through the specific pages from which questions were taken.

With busy schedules, one might be enticed to use lessons that were completed by another who has taken the exam prior. This would not be to your benefit, because part of the learning process is to locate the answers in the resources listed above and writing them down.

http://www.wiley.com/WileyCDA/WileyTitle/productCd-0470083026.html

http://www.springer.com/food+science/book/978-0-387-25025-0

Environmental Engineering: Nemerow, Agardy, Sullivan and Salvato
Prevention and Response to Water, Food, Soil, Airborne Disease and Illness Sixth Edition

Lesson 1

Chapter 1 Disease Transmission by Contaminated Water Page: 1-72

1. The most plentiful form of available water is _____.

2. Provide an example for each of the following categories of disease transmission by contaminated water:

   Waterborne diseases-

   Water-washed diseases-

   Water-based infections-

   Water-related diseases-

   Inhalation of contaminated water aerosols-

3. The etiologic agent of cyclosporiasis is _____.

4. A food associated with cyclosporiasis is _____.

5. Most waterborne disease fatalities occurred before 1940 and were attributed to the waterborne illness _____.

6. Waters suitable for drinking water supplies and shellfish rearing are monitored Routinely for _____ _____.

7. Only ____% of the global content of water constitutes fresh water.

8. A waterborne disease that can be prevented through vaccinations is _____.

9. The World Health Organization (WHO) estimates that _____% of all diseases are attributable to inadequate water or sanitation.

10. Viral infections readily spread through drinking water, food and water-contact recreation activities due to: _____.

Provide information requested for each of the following water and foodborne diseases.

11. Shigellosis:

    Specific Agent _____

    Reservoir _____

    Symptoms _____

    Incubation period _____

12. Botulism

    Specific Agent _____

    Reservoir _____

    Symptoms _____

    Incubation period _____

13. Bacillus cereus food poisoning (Emetic Type)

    Specific Agent _____

    Reservoir _____

    Symptoms _____

    Incubation period _____

14. Bacillus cereus foodborne illness (Diarrheal Type)

    Specific Agent _____

    Reservoir _____

    Symptoms _____

    Incubation period _____

15. Typhoid Fever

    Specific Agent _____

    Reservoir _____

    Symptoms _____

    Incubation period _____

16. Campylobacter enteritis

    Specific Agent _____

    Reservoir _____

    Symptoms _____

    Incubation period _____

17. Amebiasis

    Specific Agent _____

    Reservoir _____

    Symptoms _____

    Incubation period _____

18. Staphylococcus food poisoning

    Specific Agent _____

    Reservoir _____

    Symptoms _____

    Incubation period _____

19. Cholera

Specific Agent _____

Reservoir _____

Symptoms _____

Incubation period _____

20. Yersiniosis

Specific Agent _____

Reservoir _____

Symptoms _____

Incubation period _____

21. Trichinosis

Specific Agent _____

Reservoir _____

Symptoms _____

Incubation period _____

22. Cryptospordiosis

Specific Agent _____

Reservoir _____

Symptoms _____

Incubation period _____

23. Clostridium perfringins food poisoning

    Specific Agent _____

    Reservoir _____

    Symptoms _____

    Incubation period _____

24. Giardiasis:

    Specific Agent _____

    Reservoir _____

    Symptoms _____

    Incubation period _____

25. Listeriosis

    Specific Agent _____

    Reservoir _____

    Symptoms _____

    Incubation period _____

26. Scombroid fish poisoning

    Specific Agent _____

    Reservoir _____

    Symptoms _____

    Incubation period _____

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Lesson 2

Chapter 1 Historical Waterborne Disease Background Page 45-58

1. Prior to the 19th Century, civilization regarded the onset of infections being caused by foul air, commonly called _____.

2. Diseases such as typhus, _____, _____, and _____ were common in Europe, the United States, and other parts of the world prior to the 20th century.

3. Who was John Snow and what was his role in the cholera epidemic of 1849 and 1854?

4. What role did Robert Koch play in the study of cholera in the 1880s?

5. Water treatment, specifically the application of disinfectant, has practically eliminated many of the traditional waterborne diseases in developed countries, However waterborne diseases such as; _____, _____ and _____ still occur.

6. Waterborne diseases in the U.S. occur more frequently in _____ water systems.

7. Drinking water contaminated with _____ is the principle cause of waterborne diseases.

8. Cryptosporidium oocysts can survive in surface water at 4 ^{0}C for _____ months.

9. What are the six barriers of a multiple barrier plan of water treatment to ensure the safety of the consumer?

10. What do security concerns of a water treatment system take into account?

11. What are the EPA recommendations for a minimum state regulatory program regarding the surveillance of a public water supply?

12. What is involved in the security of water treatment facilities?

13. Schistosomiasis is largely endemic to _____, _____, and _____.

14. Schistosomiasis is spread by freshwater _____.

15. It is estimated that there are more than _____ cases or more annually of schistosomiasis and the number is expected to increase.

Chapter 1 Bioterrorism Page 59-67

According to these readings, define or describe the meaning of the following terms:

16. Bioterrorism-

17. Biologic Agent-

18. Describe some of the earliest attempts of bioterrorism is the 14^{th}, 15^{th} and 18^{th} centuries.

19. The selection of an agent to be used in an act of terrorism should satisfy seven properties. What are they?

20. Explain the difference between a Category A, B, and C Agents as it relates to bioterrorism.

21. List three Category A Agents

22. List three Category B Agents

23. List three Category C Agents

24. Discuss the possibility of smallpox as a viable bioterrorism tool.

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Lesson 3

Chapter 2 Page 99-137

1. Define Communicable Disease and describe how communicable diseases are transmitted.

2. List five core health problems of developing countries.

3. What are three factors that make developing countries susceptible to illnesses listed in the above question?

4. When a country shifts from infectious disease mortality to chronic disease mortality, the country is said to have undergone an _____.

5. To an epidemiologist, the term environment has a different meaning than what the general public might define it as. To an epidemiologist, the term refers to _____

   _____.

6. How can the availability of clean water and better nutrition morbidity and mortality rates?

7. What are the goals of environmental health programs? (List 4)

8. Analyzing the Epidemiologic Triangle, what are the three factors that influence disease transmission?

9. Give one example of each of these Epidemiologic triangle factors.

10. The only infectious disease to be eradicated by humans is _____.

11. Define herd immunity:

12. Arthropods involved in the transmission of human and animal disease are called _____.

13. The _____ is the source of infection which is often a non human animal.

14. List 3 control measures for eliminating or reducing the incidence of insectborne diseases.

15. What is a nosocomial transmission (disease) and give an example from the text relating to sinks.

16. What is the agent of West Nile Virus, what is the disease it causes and what species of mosquito is the vector?

17. Match the Description to the Disease: (Insert corresponding letter to each disease in the blank.)

_____ The reservoirs include dog ticks, wood tick, and the lone star tick. The etiologic Agent is Rickettsia rickettsii and it is transmitted by the bite or crushed tick blood with an incubation of 3-10 days.

_____ Is transmitted by the bite of an infective flea, X. cheopis, with rodents being the other reservoir being wild rodents. The etiologic agent is Pasteurella pestis and Yersinia pestis.

_____ Transmitted by the bite of infected tsetse flies, the reservoir of this agent includes humans, wild game and cattle

_____ Transmitted by the bite of an infected tick (Dermacentor andersoni). Symptoms occur usually four to five days after being bitten. The agent is a virus.

_____ The reservoirs are rabbits, muskrats, and other wild animals. The agent is transmitted by the bite of infected flies or ticks or ingesting undercooked rabbit meat.

_____ Caused by nematode worms, this disease is transmitted by the bite of a mosquito; Culex, Aedes, and Anopheles species with the reservoir being blood from the person harboring the agent.

_____ Also known as breakbone fever, this viral disease is transmitted by the bite of infected Aedes aegypti and A. albopictus.

_____ The etiologic agentôs reservoirs include; infected parrots, parakeets, love birds and other birds. The disease is contracted through contact with infected birds or inhalation of their desiccated waste and the incubation is 4-15 days.

_____ Fly infestation of humans and vertebrate animal tissue with fly larvae transmits this etiologic agent commonly known as the screwworm.

a. Myasis
b. Dengue fever
c. Tularemia
d. Psittacosis
e. Trypanosomiasis
f. Rocky Mountain Spotted Fever
g. Bubonic plague
h. Filariasis
i. Colorado Tick Fever

18. Nearly 40% of the worldôs population lives in regions at risk of contracting the vectorborne disease_____ and the WHO estimates over 500 million cases annually.

19. Describe the following as it relates to Malaria:

    Etiologic agent-

    The Reservoir-

    How it is transmitted-

    Incubation period and symptoms-

    Environmental factors-

20. Describe the following as it relates to Plague:

    Etiologic agent-

    The Reservoir-

    How it is transmitted-

    Incubation period and symptoms-

    Environmental factors-

21. Define zoonoses and discuss its prevalence in todayôs world.

22. Describe the following at it relates to Rabies

Etiologic agent-

The Reservoir-

How it is transmitted-

Symptoms of a rabid dog-

Prevalence and Mortality Rates-

23. Also known as woolsorterôs disease, _____ is an infectious disease principally of cattle, swine, sheep and horses.

24. In 2001, _____ , in a purified spore form was implicated in an intentional release/terrorism event that resulted in deaths in five U.S. states.

25. What actions should be taken in the possible event of a dog bite of a suspect animal?

Lesson 4

Non-Communicable Diseases Bioterrorism: Page 141-147

1. Describe the history of bioterrorism and biological warfare and some examples.

2. If smallpox has been eradicated, why is the world still concerned with its use in a terroristic plot?

3. How is anthrax contracted, what is the fatality rate?

4. With more than 2 million recognized chemical compounds and hundreds of new ones being introduced each year, there is a concern that we know so little about their affects on human health. Harmison views chemicals as falling into one of four categories. List each and include 4 to five examples of each category.

5. Give three measures that can be taken to prevent and control environmental pollutants.

Lead Poisoning Page 151-157

6. Lead is a cumulative poison ending up in the bodyôs _____, _____, and _____.

7. Lead is not easily excreted from the body of children, therefore children may experience afflictions such as: _____ _____ _____.

8. What precautions must one take when removing lead based paint to protect children, adults and the workers during mitigation?

9. What year was lead banned from being used in paint_____, in the manufacture of cans_____, in gasoline_____.

10. What has been the result of the ban on lead in such items above?

11. How do adults differ from children in the absorption of lead ingested?

12. List five sources of lead other that those mentioned in question 4.

13. What blood lead level is considered potentially harmful to children?

14. The FDA has set a limit of _____ ppm lead lechate for ceramics used for liquids in food service dishes.

Carbon Monoxide Page 166-168

15. Why is carbon monoxide sometimes confused with foodborne illness?

16. What symptoms differentiate it from foodborne illnesses?

17. Explain the physiologic affect of carbon monoxide on the human body?

18. Carbon monoxide gas has a distinctive odor and taste. True or False?

19. What are some of the more common causes of carbon monoxide poisoning?

20. What levels of CO can cause headaches?

21. What levels of CO can lead to unconsciousness?

Mercury Poisoning Page 155-157

22. What foods are associated with mercury poisoning?

23. The form of mercury found in fish has been found to be practically all _____.

24. A whole-blood level above _____ ppm may pose a mercury poisoning hazard.

DEFINITIONS: Page 165-169

25. Endemic-

26. Epidemic/Outback-

27. Pathogen-

28. Teratogen-

Nemerow, Agardy, Sullivan and Salvato: Environmental Health and Safety for Municipal Infrastructure, Land Use and Planning and Industry

Residential and Institutional Environment Starting on Page 83

Lesson 5

1. The World Health Organizationôs definition of housing is _____ _____ _____.

2. Substandard housing is said to exist when _____ _____ _____.

3. To ñblightò is to _____ _____.

4. According to a 1974 housing survey, what common problems in the late 1940s had almost been eliminated.

Backflow Prevention: Page 134-137

5. The best way to eliminate the danger of a plumbing backflow is to terminate the water inlet or faucet a distance above the flood-level rim of the fixture. This distance, referred to as the _____ _____, is one inch for a _____ inch or smaller diameter faucet or inlet pipe and two inches for a _____ inch diameter pipe.

6. What are some installation guidelines for vacuum breakers?

Indoor Air Quality: Page 137-154

7. List four recently utilized energy saving techniques that resulted in an increase in the concentration of indoor air pollutants in our homes.

8. Good indoor air quality practices dictate that at least ____ % of the re-circulated air should be clean fresh air.

9. Photocopying machines emit _____ into our indoor air we breathe.

10. The U.S. National Ambient Air Quality Standards (NAAQS) guidelines sets the limits of carbon monoxide exposure at _____ ppm for 8 hours and _____ ppm for one hour.

11. What is radon and from where does it originate?

12. Radon has a half-life of _____ and is primarily emitting _____ decay products.

13. The EPA has set a guideline limit of _____ per 24 hours for radon in our homes.

14. The EPA estimates _____ million homes exceed the aforementioned radon level limits.

15. The major health problem associated with excessive radon exposure over a period of years is _____.

16. List five potential entry sources of indoor radon from the soil into our homes.

17. What are some measures that can be taken to reduce radon contamination levels in an existing dwelling.

18. List five sources of formaldehyde in our homeôs indoor air.

19. Formaldehyde exposure levels of 1.0 to 5.0 ppm can cause symptoms such as _____, levels of 0.3 to 2.7 ppm has been found to cause people to _____. Exposure of 10 to 20 may produce _____.

20. Based on animal studies, PCBs are considered _____ _____.

21. Possible major exposure routes to PCBs are _____ _____ _____.

22. Typical chimney conditions apt to result in dangerous back-drafts, such as chimney placement, can be prevented by assuring a minimum clearance of _____ feet above the highest point of the roof line.

Institution Sanitation: Page 155-169

23. A noscomial infection is _____ _____.

24. It has been estimated that _____ percentage of patients admitted to hospitals incur infections during their stay annually.

25. Hospital acquired infection rates are highest in _____ type hospitals and lowest in _____ hospitals.

26. The infection rate is highest on the surgical service floor followed by _____, _____, and _____.

27. Wash-water temperatures for hospital laundry should be, at minimum, _____ to _____ ^{o}F for _____ minutes.

28. Hospital wastes may include _____, _____, _____, and radioactive waste, as well as _____, _____ and _____.

29. Only _____ % of all hospital wastes are infectious waste.

30. Hospital wastes are regulated by EPA, OSHA, and the _____ and _____.

31. Overcrowding and _____ are major problems at many jails and prisons, being the major reason for prisoner discontent.

32. List 5 of the most commonly found enteric pathogens reported in day care outbreaks.

Solid Waste Management Chapter 3 Page 177-258

Lesson 6

Define these terms:

1. Garbage-

2. Leachate-

3. Rubbish-

4. Source Reduction-

5. Integrated Waste Management (IWM)-

6. EPA has identified four basic management options for IWM. List them in hierarchal order:

   _____
   _____
   _____
   _____

7. Give three examples of source reduction:

   _____
   _____
   _____

8. How can consumers participate in source reduction practices?

9. _____ is perhaps the most positively perceived and doable of all the waste management options.

10. _____ are the one form of waste management that Nobody wants, but it is the only one that is both necessary and efficient.

11. The IWM option that reduces the volume of waste nine-fold is _____.

12. Many superfund sites are what is left of poorly managed _____ operations.

13. How do today's modern landfills differ from the older landfills?

14. Residential and commercial wastes make up _____% of the total municipal waste generated per person in the United States.

15. Recycling will flourish where _____ and the costs of land filling is at least _____ dollars per ton or higher.

16. The latest data (2006) estimates that _____ pounds per capita per day is generated in the U.S.

17. The Resource Conservation and Recovery Act (RCRA) defines medical waste as: _____ _____ _____.

18. Examples of medical waste includes: _____ _____ and excludes _____.

19. Most infectious waste can be treated for disposal by _____ or _____.

20. The frequency of collection of solid waste in residential areas is _____ during warm months.

Lesson 7

1. How can recycling affect savings in landfill space?

2. Why has the recycling of glass, for the most part, ceased?

3. Compost improves _____, but is a poor _____.

4. How can compost be utilized?

5. EPA requires compost attain temperatures of _____ ^{o}F for _____ days to obtain pathogen destruction before compost land spreading.

6. The principal federal requirements for municipal solid waste landfills are in _____ of RCRA.

7. The _____ sanitary landfill method is used primarily on level grounds.

8. In any landfill method, all exposed solid waste should be covered with _____ inches of earth at the end of each days operation.

9. Landfills should be located at least _____ feet from any surface water. Distance is based on _____, _____, _____ and _____.

10. EPA and others have reported that hazardous wastes probably represent less than _____% of the total waste generated by a household.

11. The two primary constituents in landfill gas generated is _____ and _____.

Hazardous Wastes: Page 292-305

12. According to regulation, the term hazardous waste means _____ _____ _____ _____ _____.

13. Hazardous wastes are regulated under EPAôs _____ Act.

14. A waste is regarded hazardous if it is _____, _____ and _____.

15. EPA lists four characteristics of hazardous waste. They are:

    a.

    b.

    c.

    d.

16. Domestic wastewater and irrigation waters are not covered by hazardous waste regulations.

    a. TRUE b. FALSE

17. Under the 1976 RCRA regulations, businesses considered small quantity Generators, generating less than _____ pounds of hazardous waste per month, were exempted from regulations.

18. The most common problems associated with the disposal of hazardous wastes are _____, _____, _____ _____ and _____.

19. List the three top generators of hazardous wastes among the 15 industries studied By EPA.

20. Of all the options available to the management of hazardous wastes, the last resort is _____ and _____.

Environmental Engineering
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Chapter 1 Water Supply page 1 to 108

Lesson 8

1. A public water system is defined under the Safe Drinking Water Act as a system having at least ____ service connections, regularly serving at least _____ individuals daily at least ____ days out of the year.

2. About ____ percent of the worldôs population do not have a safe and adequate water supply.

3. Three-fourths of all illnesses in the developing world are associated with _____ and _____.

4. According to the World Health Organization (WHO), how many people die each year from waterborne diseases caused by microbiologically contaminated water supplies or due to lack of access to sanitation facilities? _____.

5. List four factors that should be considered when determining a safe distance between a well and a sewage disposal system.

6. The percentage of the earthôs water that is salt water is _____, and the percentage that is fresh water is _____.

7. Is rain water soft or hard water?

8. Rocks that are formed by the cooling and hardening of molten rock are known as _____ rock.

9. Give examples of the following rock formations:

    a. Sedimentery-

    b. Metamorphic-

    c. Igneous-

10. Karst areas are formed by movement of groundwater through _____ rock.

11. What quantity of water is expected from igneous rock, from metamorphic rock and sedimentary rock?

12. Explain the main difference between the Primary Drinking Water Standards and Secondary Drinking Water Standards.

13. When collecting a water sample for bacteriological examination;

    a. What kind of container should be used? _____

    b. What should be added to the container if chlorinated water being sampled? _____.

    c. Samples should be examined within _____ hours.

14. If repeat samples are positive for coliform, the water system must also analyze to determine if _____ are present.

15. A _____ ml standard sample volume must be used in analyzing for total coliform, regardless of the analytical method used.

16. If the membrane filter technique is used, the coliform bacteria trapped on the filter produce a metallic sheen within _____ hours on an _____ medium containing lactose when placed in an incubator at _____ ^{o}C.

17. The fecal coliform test involves incubation at _____ ^{o}C for _____ hours as the formation of _____ indicates the presence of coliform.

18. An average person yields _____ billion coliform per day through excretement.

19. Normally, five hundred gallons of water (sample size) must be filtered to identify _____.

20. Sampling for _____ _____ usually involves the Filtration of about _____ gallons of water through a 1 micrometer pore size filter at a rate of one gallon per minute.

21. Why is it not practical to test water for specific pathogenic organisms?

22. How are odors in drinking water controlled?

23. What causes turbidity in drinking water supplies?

24. What are some constituents that cause water to have an unacceptable taste?

Page 48-69 Chemical Examination of Water

Lesson 9

1. The alkalinity levels of water passing through distribution systems made of iron pipes should be in the range of _____ to _____ mg/l as $CaCO_3$ to prevent corrosion.

2. Game fish require a dissolved oxygen level of at least _____ mg/l to reproduce.

3. Levels of fluoride that are beneficial to children during their permanent teeth developing is_____ to _____ mg/l.

4. What two inorganic substances are primarily responsible for water hardness?

5. There is ample evidence arsenic in drinking water may cause _____ _____.

6. A dose of _____ mg/kg of arsenic is a probable lethal dose

7. The MCL for arsenic in drinking water was lowered to ____ mg/l by EPA in 2001.

8. Game fish require a dissolved oxygen level of at least _____ mg/l to reproduce.

9. The compound _____ _____ is most frequently found in groundwater as a natural constituent and is easily identifiable by a rotten egg smell.

10. The final oxidation product of ammonia is _____.

11. Levels of nitrate above _____ mg/l appears to cause _____, commonly known as blue baby syndrome.

12. Under what circumstances are trihalomethanes (THMs) formed?

13. The most dire health effect from extended exposure to THMs is _____.

Source Protection of Water Supply

14. ñWellhead areaò has been defined, under the 1986 Safe Drinking Water Act amendments, as _____ _____.

15. List five critical factors in determining the wellhead protection area.

16. A well for a private home should preferably have a capacity of at least _____ gallons per hour.

17. About ____% of the U.S. population depends on groundwater for drinking and domestic purposes.

18. It is estimated that there is more than four times more groundwater than there is surface water.

    a. TRUE b. FALSE

19. _____ wells are not usually dependable sources of water supply.

20. What two types of wells are characterized as having small yields, being easily polluted, and are affected by draughts?

21. When well water shows the presence of bacterial contamination, it usually due to:

    a.

    b.

    c.

    d.

22. What advantages do drilled wells have over all other types of wells?

23. To obtain satisfactory water from a spring it is necessary to _____, _____, _____, and _____.

24. It is recommended that cistern water be treated after every rain event with a chlorine compound of at least _____ mg/l of chlorine.

25. What causes water hardness and how does one treat the problem?

26. What causes turbidity and how does one treat the problem?

27. Iron and manganese is usually found in water from _____ wells.

28. What are the effects of higher than normal levels of manganese and iron in water?

29. Chlorine bleach can be used to remove stains caused by iron on laundry.

    a. TRUE b. FALSE

30. What problems can corrosive water cause and how might the problem be treated?

31. What two protozoa are not affected by normal chlorination or UV radiation?

32. Typically, about _____% of tap water flowing into a reverse osmosis system is wasted.

Lesson 10

1. The most common chemicals used in the disinfection of drinking water include _____, _____, _____ and _____.

2. Of these listed in the preceding question, _____ is the most common method of destroying disease-producing organisms that normally might be found in drinking water.

3. A chlorinator should have a capacity to provide at least _____ mg/l free chlorine residual with _____ minute contact time at maximum flow and chlorine demand.

4. The recommended field test for measuring chlorine in water are the _____ and the stabilized _____ methods.

5. The water treatment step that removes 99% of all viruses is _____.

6. The minimum free chlorine residual at distant points in the distribution system should be _____ to _____ mg/l and a combined chlorine reading of _____ to _____ mg/l.

7. What is plain sedimentation?

8. If sedimentation detention times are 10 to 30 days, a bacteria and virus removal of _____ to _____% can be expected.

9. What happened when aluminum sulfate is added to water during the water treatment process?

10. The mixing of coagulant is usually done in two steps. What are they?

11. For the control of coagulation, _____ tests are performed in the laboratory to determine appropriate dosage of chemicals.

12. The primary purpose of filters, in the drinking water treatment process is to:
_____

_____

13. List some microorganisms that casue odor and taste problems.

14. What problems do zebra mussels present to a water treatment plant?

15. From where did zebra mussels originate and how did they get to the U.S.?

Emergency Water Supply and Treatment Page 262-269

16. Boiling water vigorously for _____ minutes will kill most pathogens in possibly polluted water.

17. If a water is not grossly polluted, is 68 F and has a low pH and turbidity level, _____ is a satisfactory method for disinfecting water in emergency situations.

18. If iodine is used as a disinfectant during emergency situations, _____ drops of 2% tincture of iodine may be used to disinfect one quart of water, which is equivalent to ____ mg/l of iodine.

Lesson 11

1. Define the following terms:

   a. Gray Water-

   b. Black Water-

   c. Excreta-

   d. Non-point pollution-

   e. Aerobic bacteria-

   f. Anaerobic bacteria-

2. Soils are divided into five classifications, they are _____, _____, _____, _____ and _____.

3. _____ and _____ soils do not drain well and thus are not usually considered suitable for the disposal of sewage by sub-surface means.

4. What effect does calcium and magnesium have on soil?

5. According to information in this chapter, it is necessary to have at least _____ inches of suitable soil between the bottom on an absorption field trench and the highest groundwater table or impermeable layer.

6. What are septic tanks capable of accomplishing?

7. What are septic tanks **not** capable of accomplishing?

8. The detention time should not be less than _____ hours.

9. If a septic tank is to receive waste from an under the sink garbage disposal unit, Its capacity (size) should be increased by at least _____ %.

10. A septic tank for a private home will generally require cleaning, by a licensed septic tank cleaning company, every _____ years.

11. Septic tanks serving commercial operations should be inspected at least every _____.

12. Sludge accumulation in a normal home septic tank has been estimated at _____ gallons per person per year.

13. What are 4 possible results of using septic tank cleaning solvents, additives, or other such hazardous chemicals to a septic tank?

14. What other kinds of household items should a homeowner not introduce into a septic tank?

15. Why is the use of copper sulfate crystals recommended for some septic tank systems?

16. List six common causes of septic tank system failures.

17. In a septic tank, when the depth of settled sludge or floating scum approaches the depth of _____ inches in a 1000 gallon tank with a 30 inch liquid depth, the tank needs cleaning; in a septic tank with 36 inches of liquid depth, the depth of sludge requiring one to clean the tank.

18. The septic tank absorption field should be _____ feet from any well, _____ feet or more from any lake, swamp, ditch or watercourse.

19. What is the overall purpose of bar screens, comminutors, and grit chambers?

20. The most commonly used biological treatment process for removal of organic matter from wastewater is _____ _____.

21. The use of a mass of activated microorganisms in a basin that is aerated is a biological treatment process known commonly as _____ _____.

22. What are Rotating Biological Contactors (RBCs)?

23. How are RBCs similar to trickling filter systems?

24. What is the BOD removal efficiency for the following treatment processes:

    a. Activated Sludge _____

    b. Trickling Filters _____

    c. RBCs _____

25. Provide the following information related to facultative ponds:

    a. Detention Time _____

    b. Liquid Depth _____

    c. BOD Removal % _____

Lesson 12

Principles of Food Sanitation, Marriott and Gravani, Sixth Edition

Chapter 1 Page 1-12 and Chapter 3 Page 25-36

1. What are psychotropic bacteria? Give 3 examples.

2. What makes Salmonella a unique foodborne pathogen?

3. Explain the difference between the terms substantive and advisory regulations and ñshouldò and ñshall.ò

4. Products subject to seizure by FDA during interstate commerce include _____ and _____.

5. FDA is under the jurisdiction of _____.

6. The first HACCP regulation written by FDA required processors of _____ to develop and implement HACCP systems for their operations.

7. The USDA had jurisdiction over three areas of food processing, they are _____, _____, and _____.

   The inspections are administered by _____.

8. The objective of the 1996 Pathogen Reduction: HACCP Final Rule was to reduce foodborne illness associated with _____ and _____.

9. Two types of pathogenic microorganisms that grow in or are carried by foods are those that cause _____ and _____.

10. The microorganisms most common to food are _____ and _____.

11. Fungi consists of two major microbe groups, _____ and _____.

12. Describe the morphology and appearance of molds.

13. Molds can survive a pH as low as _____ and prefer a water activity of _____.

14. What are the pH and water activity requirements for yeasts?

15. A virus particle consists of _____.

16. To what extent do viruses cause foodborne illness?

Define the following and give an example of each of these temperature related terms:

17. Mesophilic-

18. Thermophilic-

19. Microorganisms requiring free oxygen are called _____ microbes, while those that thrive in the absence of oxygen are known as _____.

21. What are biofilms?

22. Define foodborne outbreak.

23. 66% of all foodborne outbreaks are caused by _____.

24. Explain the differences between food intoxications and food infections.

25. Evisceration and cold storage of chickens at 3 ^{0}C (37.4 ^{0}F) may permit an increase in this foodborne illness _____.

Lesson 13

Principles of Food Sanitation, Marriott and Gravani, Sixth Edition

Note: the majority of the information regarding specific foodborne illnesses on page 37-50 are in Lesson 3

Following Questions are from Chapter 3 Page 37-53, Chapter 4 Page 70-75 and Chapter 16 Page 283-286

1. The foodborne illness, _____, is now recognized as one of the most frequent causes of bacterial diarrhea and there is mounting evidence that it causes ulcers.

2. What food preparation practice is generally the cause of Clostridium perfringins foodborne illness?

3. What food preparation practice is generally the cause of E-coli 0157:H7 foodborne illness?

4. What food preparation practice is generally the cause of Salmonellosis?

5. What food preparation practice is generally the cause of Shigellosis?

6. What food preparation practice is generally the cause of Trichinosis?

7. What are aflatoxins and what public health danger do they pose?

8. The most common cause of ñtravelerôs diarrhea, an illness frequently acquired during visits to developing nations is _____.

Chapter 4- Food Allergens Page 70-75

9. What is an allergen?

10. What foods are more likely to contain allergens?

11. How is a food allergen triggered?

12. How many emergency room visits and deaths are attributed to food allergens in the U.S. each year?

13. _____% of adults and _____% of infants and young children are affected by food allergens.

14. What areas should a food allergen control program address?

15. What kinds of tests have been developed to give processors quick, accurate tools to check for traces of allergens in food items?

Chapter 6- Personal Hygiene Page 83-97

16. Define ñcarrierò

17. Describe the difference between convalescent, chronic, and contact carriers.

18. The first line of defense against disease is frequent and effective _____.

19. Approximately _____ percent of food contamination is attributable to improper _____.

20. When describing methods of disease transmission, what is the difference between direct and indirect transmission.

21. Selection of food service employees should be predicated on 5 facts. What are they?

22. Hand washing for _____ seconds with soap and water will remove transient bacteria from the hands.

23. How effective are alcohol based sanitizers and which ones are best?

24. Milk and milk products have been identified as a vehicle for transmission in approximately _____ per cent of salmonellosis cases.

25. Approximately five to ten percent of raw bovine milk is contaminated with the bacteria _____ _____.

26. What illness and what foods were implicated in a 1983 outbreak in Massachusetts and a 1985 outbreak in Los Angeles?

27. _____ based sanitizers should not be used on food contact surfaces or in cheese factories as lactic acid starter culture bacteria are inactivated by small residues of this sanitizer.

Lesson 14
Chapter 7, 10 and 13

Chapter 7 The Role of HACCP in Sanitation Page 99-114

1. The acronym HACCP stands for _____.

2. The two major thrusts of HACCP is to _____ and _____.

3. The HACCP concept was developed in the 1950s by _____ and _____.

4. What is a critical control point?

5. List the 7 principles of HACCP

Chapter 10 Sanitizers Page 165-189

6. A _____ is an agent that destroys or eliminates all forms of microbial life.

7. A _____ is an agent that kills infectious bacteria and fungi only, though do not kill bacterial spores.

8. A _____ is a substance that reduces, but not necessarily eliminates microbial contaminants on inanimate surfaces to levels that are considered safe from a public health standpoint.

9. The most active of the chlorine sanitizers and also the most widely used are _____.

10 Iodine sanitizers are effectively utilized at concentrations of _____ ppm to _____ ppm to sanitize surfaces.

11. The sanitizer that is most corrosive to stainless steel and other metals are _____ compounds.

12. The sanitizer compounds that are more stable in the presence of organic matter are the _____ compounds.

13. Because the _____ sanitizer compounds are acidic, they are not affected by water hardness as the other types of sanitizers are.

14. The _____ compounds are frequently used on floors, walls, furnishings and equipment because they are good penetrants.

15. Why are chemical sanitizers ineffective in killing microbes present in cracks and crevices?

16. The sanitizer most effective at killing viruses is _____.

Chapter 13 Pest Control Page 235-255

17. House flies lay an average of _____ eggs within a week of mating.

18. What is the ideal environment for houseflies to lay and hatch their eggs with subsequent growth of the larvae?

19. The National Restaurant Association has estimated the loss from rodent damage could be as high as _____ dollars annually.

20. Sewer rat, brown rat, wharf rat are common names for the _____ rat.

21. The female rat can produce _____ young per litter, _____ times per year.

22. Rats can force entry through openings as small as a _____ and can jump up to _____ vertically and _____ horizontally.

23. What is bromethalin and what are effects of its use?

24. The most common pests among food processing plants and food service facilities throughout the world are the _____.

25. The first line of defense in the control of pests is _____.

26. What is diazinon and dursban?

27. What diseases can potentially be spread by the housefly?

28. Which species of cockroach is more likely to found in food preparation areas?

29. Which species of cockroach found in the U.S. is the largest at approximately 40 to 60 mm in length?

30. The most abundant species of rat in the U.S. is the _____.

31. What is IPM and what are its objectives?

Lesson 15
Read State Pool and Spa Manual

1. It has been well documented that _____ and _____ infections have been contracted from spa pools.

2. Why is pseudomonas of particular concern in spa pools?

3. If a pool is 30 feet long and 15 feet wide with a water depth of 6 feet, how many gallons of water does it hold?

4. The turnover rate required of wading pools is _____ hours or less and for pools other than diving or water slide pools is _____ hours or less.

5. Most pools should have _____ percent of the water removed by the skimmer or scum gutter and _____ percent removal by the drain during normal operation.

6. How often should spa pools be drained?

7. The skimmer works effectively at removing floating body oils and bacteria in a water level range of about _____ inches.

8. What are the filter rates in a high rate sand filter?

9. _____ filters have limitations and for public pools, should not be used for indoor pools.

10. HTH and Sentry are two common brands of _____ _____, other brands may be used if they contain _____ _____.

11. What are the dangers inherent in using calcium hypochlorite?

12. The granular form of calcium hypochlorite has _____ % available chlorine.

13. What effect does granular chlorine have on pH?

14. Due to convenience, _____ chlorine has become more popular with pool operators.

15. Liquid chlorine has a pH of about _____, so the pH must be balanced by _____.

16. When chlorine gas is utilized as a swimming pool disinfectant, one must add _____ pounds of soda ash for every pound of chlorine added to a pool to _____ the pH.

17. Soda ash is a common name for _____.

18. If cyanuric acid is used, the cyanurate levels must not exceed _____ ppm.

19. Under what circumstances is cyanuric acid used?

20. List 5 factors that affect the germ killing powers of chlorine in swimming pools.

21. Perspiration and urine combine with chlorine forming a new chemical called _____ _____ .

22. When is super-chlorination necessary and how is it accomplished?

23. Spa pools are required to maintain a minimum free chlorine residual of ___ ppm.

24. Bad odors associated with spa pools are often caused by _____.

25. Total chlorine minus _____ equals combined chlorine.

26. The maximum allowable level of combined chlorine is _____ ppm.

Lesson 16
Read State Pool and Spa Manual

1. List 5 problems associated with water that has a pH level that is too high.

2. List four problems associated with water that has a pH level that is too low.

3. The acceptable pH range is from _____ to _____, however the recommended pH range for a pool is _____ to _____.

4. When pH starts to go out of range, it can be easily corrected. To raise pH, add Sodium _____and to lower pH, add Sodium _____.

5. The most frequent reason for closing a pool is _____.

6. How often should one testing for free chlorine? _____.

7. The only approved type of chlorine test kits are _____.

8. List four important tips to remember when testing for free chlorine.

9. Essentially all test kits use _____ _____ for the determination of pH.

10. The ideal total alkalinity water parameter in pools is _____ ppm.

11. What happens when alkalinity of pool water is too low?

12. The chemical compound ,_____ _____ ,is commonly used to raise alkalinity.

13. If a pool is officially closed, who can re-open it?

14. Pools with maximum depths of less than _____ feet shall not be used for diving and must have ñNO DIVINGò signs with clean legible letters that are _____ inches high in plain view.

15. Algae is not a problem in pools if a chlorine level of _____ ppm is consistently maintained.

16. The proper pool parameter for calcium hardness is _____ ppm.

17. The amount of chlorine required to oxidize (remove) ammonia in water is known as _____.