



Environmental Health Specialist Exam Study Guide

Acknowledgement

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Introduction

This study guide has been designed to help you prepare for the Registered Environmental Health Specialist written examination. Please note that the words *exam* and *examination* are considered the same throughout the guide as are the words *questions* and *items*.

The detailed nature of this document illustrates the complexity of the environmental health field of practice. This study guide is based on the 2005 Job Analysis performed by the REHS Program, that identified the important job duties, and the knowledge and skills required for an entry-level REHS to perform the job duties in a minimally competent manner.

Your formal study, training, and experience in environmental health should have provided you with the knowledge and skills you need to pass the examination. However, we suggest that you also study the information given here about the examination process and content.

This guide includes the following sections:

- Ten Essential Environmental Health Services
- Passing Score Information
- General Test Preparation Information
- General Strategies for Taking Written Tests
- Examination Content Overview
- Detailed Content Categories
- Sample Test Questions

If you have any questions regarding your application or this examination, you may contact the Department of Public Health.

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Ten Essential Environmental Health Services

In addition to technical competence, successful environmental health practitioners need to be aware of the Essential Services of Environmental Health. Although not suitable to test in a multiple-choice exam format, the ten essential services are fundamental principles in an effective environmental health program and a REHS should be familiar with them.

Essential Environmental Health Services:

1. **Monitor** environmental health status to identify and solve community environmental health problems.
2. **Diagnose and investigate** environmental health problems and health hazards in the community.
3. **Inform, educate, and empower** people about environmental health issues.
4. **Mobilize** community partnerships and actions to identify and solve environmental health problems.
5. **Develop policies and plans** that support individual and community environmental health efforts.
6. **Enforce laws and regulations** that protect health and ensure safety.
7. **Link** people to needed environmental health services and assure the provision of environmental health services.
8. **Assure** competent environmental health workforce.
9. **Evaluate** the effectiveness, accessibility, and quality of personal and population based environmental health services.
10. **Research** for new insights and innovative solutions to environmental health problems.

Passing Score Information

A criterion-referenced approach (e.g., Modified-Angoff method) is used by licensure and certification exams for setting the pass point. The Modified-Angoff method is used to set the pass point for the REHS exams; it involves setting the pass point based on minimum standards for competent practice (i.e., job requirements) rather than relative candidate performance (e.g., grading on the curve.). Subject matter experts in the field are consulted throughout the process to ensure a fair and accurate pass point. Standards are consistently applied to all forms of the exam to ensure a fair pass point for all candidate groups. An advantage of this approach is that the pass point may be lowered for a hard exam and increased for an easy exam.

General Test Preparation Information

Following is information to help you study for the written examination for the State of California Environmental Health Specialist Registration.

Do some work every day in preparation for the examination. Budget your time; set aside a definite study period for each day. Begin concentrating as soon as you sit down to study.

- Study by yourself and with others to encourage an exchange of ideas. Your study should focus on content areas listed in this study guide. *It is not advisable for candidates to memorize large groups of test questions for the REHS examination.* A large, computerized item bank has been created to generate different test forms on a regular basis.
- The focus of your study should be on knowledge and skills relevant to a newly registered Environmental Health Specialist.
- Develop your own illustrations and examples to check on your understanding of a topic. Make sure you fully understand the basic terms for each content area. Create your own glossary of terms and look up any new words in a reference book.
- The test will contain items at various levels of cognitive ability. Consequently, it is important to be able to understand, apply, and analyze the material as you would on the job. Although all questions will be in a multiple-choice format, the items will be presented in a number of forms. For example, a written scenario may be followed by a series of three or four questions.
- Some test takers are anxious about taking tests and need to simulate the test taking situation. If this is true for you, you may want to give yourself actual practice in a quiet, distraction-free environment.

General Strategies for Taking Written Tests

The basic format for this test is the multiple-choice format with four choices. Here are some general hints for taking this type of test:

- Most importantly, the test is designed to have *only one answer that is best from among the four choices given*.
- Your attitude about the test process can make a difference. Approach the test confidently. Arrive in plenty of time for the test so you do not feel rushed.
- Be certain that you understand how to correctly use the computer scannable answer sheet. Make sure you are careful to make clean erasures on your answer sheet and to only mark one correct answer per test item.
- Instructions, which will be read to you by a proctor, are very important, so be sure to listen carefully. These may include helpful clues. Ask questions if there is something that you do not understand about the instructions but be aware that your proctor cannot answer questions about test content issues.
- Read all directions carefully, twice if necessary.
- Your score on this test will be based only on the number of correct choices you make (the number of times you select the best choice from the four given). All test items are equally weighted even though there are different weights for specific program areas. You may guess on questions that you are not sure of as you go through the test. Mark them in your booklet for further consideration if you have time after you finish the entire test. Remember, this test does not penalize you for incorrect answers or guessing.

- Read each question carefully, making sure that you understand it before you answer. Reread it, if necessary, but do not waste time on questions that seem too unfamiliar or difficult. Interpret words according to their generally accepted meanings. Rephrase or underline key words in difficult questions. No question is intended to be a “trick” or “catch” question.
- Answer the easy questions first; postpone answering the more difficult questions until later, making an initial guess in case you do not have enough time to go back to it. Check your answers if you do have time; however, remember that often your first response is correct.
- Watch your time carefully during the test.
- If you find a question that you believe may be incorrect, you can comment on the calculation sheet provided. Include why you believe the question may be incorrect. This must be done during the allotted time for each examination book. Subject matter experts and testing specialists will carefully review all comments. Try to focus on doing well on many items on the test rather than getting bogged down on “making your case” on just one item that counts as one point. We use extensive quality control measures to ensure a flawless test, including panel reviews by qualified subject matter experts in your field and state-of-the-art computerized scoring and item analysis techniques.

Examination Content Overview

The examination covers a wide range of environmental health topics. Below, the environmental health knowledge areas are listed according to their relative emphasis currently applied in California. The next section provides information on the specific knowledge and skills covered on the test. The interrelated nature of the environmental health knowledge and skills means that many questions will relate to more than one topic. The examination contains 260 questions. For administration purposes, the 260 questions are split into two booklets—each comprised of 130 questions.

♦ **Highest Emphasis on the Exam (not in any order of importance):**

- General Math and Science
- Inspections and Investigations
- Food and Consumer Protection
- Drinking Water
- Recreational Waters and Public Pools

♦ **Medium Emphasis on the Exam (not in any order of importance):**

- Hazardous Materials and Hazardous Waste Management
- Solid Waste, Medical Waste Management
- Bloodborne Pathogens
- Wastewater Management
- Disaster Management
- Vector borne and Zoonotic Disease Control

♦ **Lowest Emphasis on the Exam:**

- Air Quality and Pollution Control
- Housing and Institutions
- Land Use

Detailed Content Categories

A detailed description of each environmental health program area follows. The specific content areas should be interpreted broadly. When examples are provided in the following statements, they are not necessarily inclusive of all the things that may be tested. Additionally, each form of the REHS examination samples the knowledge and skills listed below; all the relevant knowledge and skills are not assessed on a particular exam.

GENERAL ENVIRONMENTAL HEALTH

This section is comprised of 55 questions covering (1) general math and science knowledge and skills and (2) knowledge and skills about the inspections and investigation process.

❖ GENERAL MATH AND SCIENCE

Knowledge of:

➤ Algebra

- Solve Simple Algebraic And Quadratic Equations
- Convert Measurement Units
- Milligrams per Liter To ppm

➤ Geometry And Trigonometry

- Areas
- Volumes
- Interpret Graphs, Charts, Etc

➤ Statistical Terms and Principles

- Mean
- Median
- Mode
- Range
- Variability
- Probability
- Normal Distribution, Bell Shaped Curve
- Skewed Distribution
- Correlation
- Regressive Vs. Progressive Studies
- Random Sampling

➤ Basic Arithmetic

- Addition
- Subtraction

- Multiplication
- Division
- Calculate Percent

➤ Epidemiology

- General Terms And Principles Of Epidemiology
 - Case Studies
 - Etiology
 - Index Case
 - Fomites
 - Correlation Vs. Association
- Types Of Outbreaks
 - Endemic
 - Sporadic
 - Epidemic
 - Pandemic
- Disease Attack Rate
 - Incidence
 - Prevalence
 - Mortality Rate
 - Morbidity Rate
- Limiting Or Exacerbating Factors
 - Age
 - Occupation
 - Health
 - Environmental Factors
 - Behavioral Risk Factors
 - Virulence
 - Immunity/Vaccination
 - Highly Susceptible Population
 - Acquired Immunity

- Modes Of Transmission/Exposure
 - Fecal/Oral
 - Droplet Contamination
 - Exudates Of Mucous Membranes
 - Bloodborne
 - Vector Borne
 - Dermal Exposure
 - Contaminated Food Or Water
 - Direct Contact
 - Contaminated Fomites
 - Secondary Infection
- Patterns Of Disease
 - Incubation Period
 - Duration Of Symptoms
 - Carrier
 - Asymptomatic
 - Convalescence
 - Period Of Communicability
 - Intermediate Hosts/Vectors
- **General Chemistry**
 - Nomenclature
 - Periodic Table
 - Atomic Weight
 - Stoichiometry
 - Parts Of Atoms
 - Electrons
 - Protons
 - Neutrons
 - Valance
 - Bonding
 - Oxidation-Reduction Reactions
 - Molecules Vs. Atoms Vs. Elements,
 - pH
 - Acid, Alkaline
 - Logarithmic Scale
- **Organic Chemistry**
 - Organic Vs. Inorganic Structures
 - Isomers
- Free Radicals
- Carbon Bonds
 - Benzene Rings
 - Hydrocarbons
 - Unsaturated
 - Polyunsaturated
 - Saturated
- Biochemistry
 - Semi Permeable Membranes
- **Biology**
 - Cell Biology
 - Major Organelles
 - Eucaryotes
 - Procaryotes
 - Vertebrates Vs. Non-Vertebrates
 - Physiology
 - Major Systems
 - Respiratory
 - Circulatory
 - Digestive
 - Immune System
- **Anatomy**
 - Major Organs
 - Bones
 - Tissues
 - Eyes, Skin, And Nasal Passages
- **Ecology**
 - Diversity
 - Habitat
 - Niche
 - Carrying Capacity
- **Taxonomy**
 - Kingdom
 - Phylum
 - Class
 - Order
 - Family
 - Genus

- Species
- **Genetics**
 - Mitosis – Meiosis
 - Recessive Genes, Dominant Genes
 - Phenotype, Genotype
- **Evolution**
 - Natural Selection
- **Microbiology**
 - General Awareness Of Microbial Types Of Disease-Causing Organisms Of Human Importance
 - Bacteria
 - *Escherichia*
 - *Salmonella*
 - *Shigella*
 - *Enterobacter*
 - *Mycobacterium*
 - *Staphylococcus*
 - *Streptococcus*
 - *Clostridium*
 - *Vibrio*
 - *Listeria*
 - *Bacillus*
 - *Yersinia*
 - *Campylobacter*
 - Rickettsia
 - *Rickettsia*
 - Fungi
 - *Aspergilla*
 - *Stachybotrys*
 - *Tinea*
 - *Coccidioides*
 - Protozoa
 - *Plasmodium*
 - *Amoeba*
 - *Giardia*
 - *Toxoplasma*
 - *Cryptosporidium*
 - *Cyclospora*

- *Entamoeba*
- Algae
 - Blue-Green Algae
 - “Red Tides”
 - Paralytic Shellfish Poisoning (PSP)
- Helminthes, Nematodes, And Trematodes
 - *Anisakinae*
 - *Echinococcus*
 - *Taenia*
 - *Ascaris*
 - *Schistosoma*
 - *Trichinosis*
 - *Necator*
- Virus
 - Hepatitis A And B
 - Acquired Immunodeficiency Syndrome (AIDS)
 - *Norovirus*
 - Encephalitis
 - Western Equine Virus
 - St Louis Virus
 - West Nile Virus
 - *Hantavirus*
 - Influenza
 - *Lyssavirus*
- **Laboratory Tests To Identify Pathogens**
 - Rods
 - Cocci
 - Spirochetes
 - Gram Stain
 - Acid Fast Stain
 - Spore Formers
 - Cyst Formers
 - Lactose Fermenters
- **Microbial Growth And Multiplication**
 - Bacterial Reproduction
 - Generation Time

- Phases Of Growth
 - Lag Phase
 - Log Phase
 - Stationary Phase
 - Die Off

➤ **Viral Reproduction**

- Dependent On Host Cell
 - RNA/DNA
 - Protein Coat
 - Mutation
 - Resistance
 - Phage

➤ **Microbial Terms**

- Obligate Aerobes
- Obligate Anaerobes
- Facultative Anaerobes
- Psychrophiles
- Mesophiles
- Thermophiles
- Acidophiles
- Neutrophiles
- Alkalophiles
- Halophiles
- Halotolerant
- Osmophiles
- Xerophiles
- Endotoxin
- Exotoxin

➤ **Physics**

- Structure Of Matter
- Acceleration, Velocity And Force
- Newton's Laws Of Physics
- Relativity
- Waves And Particles
- Energy
- Atomic Structures

➤ **Toxicology**

- Terms

- Carcinogenic
- Tetrogenic
- Teratogenic
- Mutagenic
- Poison

○ Exposure

- Acute Vs. Chronic
- Inhalation
- Ingestion
- Injection
- Dermal

○ Effect Of Dose

- Lethal Dose (LD 50)
- Dose / Response
- Time Weighted Average (TWA)

❖ **Inspections And Investigations**

Knowledge Of:

➤ **Basic Legal Terminology**

- Consent
- Deposition
- Subpoena
- Injunction
- Impound
- Embargo
- Seizure
- Permits
- Condemnation
- Voluntary Condemnation
- And Destruction

➤ **Legal Methods Used To Obtain Information During Investigations And Inspections**

- Observation
- Interviews
- Written Communications
 - Review Operator's Files
 - Historic Office/File Review
 - Public Records Act
- Evidence Collection

- Inspection Warrant
 - Methods Of Lawful Inspections
 - Right Of Entry
 - Plain Sight
- **Jurisdiction, Authority, And Structure Of Environmental Health Agencies**
 - State Law Vs. Delegated Authority From Federal Government
 - Local Vs. State Jurisdiction
 - Authority Of The Health Officer To
 - Enforce Laws, Regulations, Codes And Ordinances
 - Inspect Facilities / Private And Public Property
 - Issue And Condition Permits To Operate
 - Impound, Embargo, Seize, Condemn Property
- **Legal Process**
 - Administrative Authority
 - Notice Of Violation
 - Notice To Comply
 - Notice And Order
 - Intent To Close/Notice Of Closure
 - Cease And Desist Order
 - Administrative Or Office Hearing
 - Administrative Penalties
 - Due Process
 - Civil Vs. Criminal Law
 - Infraction Vs. Misdemeanor Vs. Felony
 - How A Bill Becomes A Law
 - Understand Codes With Multiple Sections, Paragraphs, Subparagraphs, Articles, Exemptions, Etc.
- **General Environmental Sampling And Testing Concepts**
 - Chain Of Custody
 - Sample Integrity/Protocols

- Transportation
 - Temperatures
 - Timeliness
- Representative Sampling
- Aseptic Technique
- Labeling
- Documentation
- Legal Authority To Collect Samples
- Personal Protective Equipment (PPE) And Safety
- Calibrate, Use, Maintain, And Interpret The Results Of Field Inspection Equipment. For Each Piece Of Equipment Named Below Know What It Measures, How To Operate And Maintain It And The Limits Of The Equipment
 - Thermometers
 - Pool Test Kits
 - Combustible Gas Meters
 - Fat Analyzers
 - Hydrometer
 - PH Test Strips, Or Meter
 - Sanitizer Test Strips (Chlorine, Quaternary Ammonium, And Iodine)
 - Maximum Registering Thermometer Or Thermolabels
 - Digital Camera
 - Photo Ionization Detector
- **Cultural Practices And Norms**
 - Awareness Of Cultural Differences
 - Possible Offensive Behavior
 - Respect For Others
- **Administration Principles**
 - Developing Vision, Goals And Objectives
 - Finance And Budgeting
 - Personnel Supervision
 - Program Monitoring And Evaluation

➤ **Basic Interviewing Techniques And Principles**

- Introduction
- Observations
- Identification Of Applicable Environmental Health Laws
- Open Ended Questions
- Demonstrations
- Explanations
- Documentation
- Location And Timing Of Interview
- Exit Interview Protocol

➤ **Conflict Resolution Techniques**

- De-Escalation
- Developing Listening Skills
- Empathy
- Paraphrase And Repeating
- Body Language
- Approach – First Impression
- Know When To Leave

➤ **Ethical Practices**

- Conflict Of Interest
- Gratuities/Gifts
- Professional Code Of Ethics
- Public Accountability/Transparency
- Consequences Of Unethical Practices (E.G., REHS Revocation)
- Confidentiality
- Slander/Defamation/Libel/Rumors
- Favoritism/Recommendations
- Illegal Discrimination
- Personal Accountability
- Work Ethics

➤ **Personal Protection Equipment And Procedures**

- Hard Hat/Other Protective Headgear
- Ear Plugs
- Air Purifying Respirators
- Gloves
- Goggles

- Safety Shoes
- Environmental Hazards
 - Sun Protection
 - Insect Repellant
 - Hydration/Heat Stress
 - Poisonous Plants
 - Animals
- Occupational Safety And Health Administration (OSHA) Requirements Related To Environmental Health Occupations
 - Confined Spaces
 - Equipment
 - Partner
 - Air Supply
 - Trench Shoring
- Material Safety Data Sheet (MSDS)
- Illness Injury Prevention Program (IIPP)
- Office Safety
 - Ergonomics

➤ **Risk Assessment**

- Identify Public Health Risks
- Respond Appropriately To Public Health Impacts
- Project/Time Management
 - Prioritize Workload

ENVIRONMENTAL HEALTH PROGRAM AREAS

This section of the exam is comprised of a total of 205 questions specific to environmental health program areas. The knowledge and skills gained during the time spent in an approved training program or an environmental health internship will be helpful in answering these multiple-choice questions.

❖ Food And Consumer Protection

Knowledge Of:

- **Jurisdiction And Authority; Federal And State Laws Regulating Food Facilities**

- California Health And Safety Code,(CHSC) Sections, 113700-114437(California Retail Food Code)
 - Definitions
 - Permit Requirements
 - Articles
 - Authority
 - Exceptions To Cal Code
 - Know What The Food Manager And Food Handlers Know
- Federal Food, Drug, And Cosmetics Law
 - Pull-By Dates
 - Food Code, US Public Health Service
 - US Dept. Of Agriculture
 - Federally Inspected Food Facilities
- Sherman Food, Drug, And Cosmetics Law
 - Wholesale Vs. Retail
 - Truth In Menu
 - Definitions For Labeling, Adulteration, Misbranding
- Other California Regulatory Agencies
 - California Dept. Of Food And Agriculture
 - Milk And Dairy Food Safety Branch
- California Department Of Public Health (CDPH)
 - Food, Drug And Radiation Safety Division
 - Division Of Drinking Water And Environmental Management
- Disease Agents For The Following:
 - *Salmonella*
 - *Shigella*
 - *Campylobacter*
 - *Hepatitis A And E*

- *E. Coli*
- *Clostridium Species*
- *Giardia Lamblia*
- *Staphylococcus*
- *Entamoeba*
- *Bacillus Cereus*
- *Norovirus*
- *Yersinia*
- *Listeria Monocytogenes*
- *Trichinella Spiralis*
- *Vibrio Species*
- *Anisakis*
- *Cyclospora*
- Disease Characteristics For Each Disease Agent
 - Incubation Period
 - Symptoms And Duration
 - Type Of Illness: Intoxication, Infection, Or Toxin-Mediated Infection
 - Most Likely Food Source
 - Common Mode Of Transmission
 - Common Disease Name
 - Prevalence
 - Susceptibility And High-Risk Populations
- General Foodborne Illness
 - Infections
 - Definition
 - Typical Symptoms
 - Intoxications
 - Definition
 - Typical Symptoms
 - Toxin-Mediated Infections
 - Definition
 - Typical Symptoms
- Chemical And Physical Contaminants
 - Naturally Occurring

- Ciguatoxin (Toxic Algae Toxin)
 - Mycotoxin (Molds, Yeast, Mushrooms)
 - Scombrototoxin (Histamine Poisoning)
 - Shellfish Toxins
 - Paralytic Shellfish Poisoning (PSP)
 - Domoic Acid Poisoning (DAP)
 - Neurotoxic Shellfish Poisoning (NSP)
- Manmade Chemicals
 - Cleaning Solutions
 - Food Additives
 - Pesticides
 - Heavy Metals
 - Food Preservatives
 - Medical Supply Additives
- Physical Contaminants And Food Adulteration
 - Definition Of Adulteration – Cal Code 113732
 - Sources – Facility, Manufacturing Process, Light Shields, Personal Effects, General Sanitation
- Modes Of Foodborne Illness Transmission
 - Fecal/Oral Route
 - Role Of Personal Hygiene, Infected Wounds, And Asymptomatic Carriers
 - Potential For Droplet Contamination
 - Role Of Fomites
 - Cross Contamination
 - Pathogen Growth In Foods
- Food-Borne Illness Investigation Protocols
 - Define Attack Rates
- Morbidity Rates
- Mortality Rates
- Food Specific Attack Rate Table
- Laboratory Results
 - Used To Confirm Diagnosis
 - Depend On Proper Handling Of Food Samples
 - Importance Of Detection Limits
 - Quality Assurance And Control (QA/QC)
- Food Histories
 - Three-Day Complete Food History
 - Persons Who Shared Meal
 - Source Of Suspected Food
 - Trace Backs
- Etiological Agent Identification
 - Characteristics Of The Case Definition
 - Incubation Period
 - Mode Of Transmission
 - Verify Hypothesis – See Lab Results
- Inspection Observations
 - Implicated Food
 - Prep Methods
 - Sampling
 - Food Source
 - Chain Of Custody
- Sampling And Testing Methods
 - Chain Of Custody, Security, Labeling
 - Sterile Technique
 - Split Samples
 - Sample Integrity

- Proper Tools And Equipment For Sampling
 - Certified Lab For Testing
- Hazard Analysis And Critical Control Points (HACCP)
- Seven HACCP Principles
- “Process HACCP”
- What Processes Are Required To Have A HACCP Plan
- Exemptions For Potentially Hazardous Foods (PHF)
- Time And Temperature
 - Time As A Public Health Control
 - Reheating And Cooling
 - Hot Holding And Refrigeration Equipment
- Inadequate Cooking
- Cross Contamination
- Poor Personal Hygiene
- Construction Standards
 - Basic Structural Requirements For New Food Facility
 - Indirect Connections
 - Required Sinks
 - Type Of Flooring
 - Wall Surfaces
 - Commercial Equipment
 - Exhaust Systems
 - Interpret Blueprint Symbols

❖ **Drinking Water**

Knowledge Of:

- **Federal And State Laws And Guidelines Regulating Drinking Water Including**
 - California Safe Drinking Water Act (SDWA)
 - Bulletin 74-90 And 74-81
 - Jurisdiction And Authority Of Local Construction Standards

➤ **Drinking Water Quality Standards**

- Primary
 - Radioactivity
 - Organic
 - Synthetic
 - Volatile
 - Inorganic
 - Nitrites/Nitrates
 - Heavy Metals
 - Biological
 - Total And Fecal Coliform Bacteria
- Secondary
 - Taste
 - Odor
 - Appearance

➤ **Public Water Systems With 15 Or More Service Connections Or That Regularly Serve At Least 25 Individuals Daily At Least 60 Days Out Of The Year.**

- Community
- Non-Transient Non-Community
- Transient Non-Community
- Water System Sampling Plan
 - Location Of Sampling Points

➤ **Disease Agents**

- *Giardia*
- *Cryptosporidium*
- *E. Coli*
- *Salmonella*
- *Shigella*
- *Campylobacter*
- *Hepatitis A And E*
- *Pseudomonas*
- *Entamoeba Histolytica*
- *Leptospirosis*
- *Vibrio*
- *Polio*

➤ **Disease Transmission**

- Cross-Connections
- Pollution
- Water Treatment System Failure

➤ **Source Water**

- Ground Water
- Ground Water Under The Influence Of Surface Water
- Springs
- Surface Water

➤ **Potential Contamination Of Source Water**

- Underground Storage Tanks
- Naturally Occurring (Arsenic, Radioactivity)
- Agricultural Activities
- Sewage Disposal Systems
- Mining Activities
- Solid Waste Disposal Sites
- Industrial Activities

➤ **Cross-Connection Control Terms And Principles**

- Level Of Hazard Determines
 - Control Devices (E.G. Air Gap)
- Backflow Prevention Devices
 - Reduced Pressure Principle Valves
- Check Valves

➤ **Water Sampling And Testing Equipment**

- Chlorine Test Kit
- pH Meter, pH Paper
- Total Dissolved Solids (TDS) Meter
- Turbidity Meter
- Sterile Sample Bottles
- Sampling Techniques
 - Identify Good Sampling Tap
 - Proper Handling Of Sample
 - Purpose Of Sodium Thiosulfate

- Obtaining A Representative Sample

○ Testing Protocol – Knowledge Of Advantages / Disadvantages

- Coli-Alert Test
- Membrane Filter Test
- Multiple Tube Fermentation

○ Physical Examinations

- Odor
- Taste
- Turbidity
- Color
- Temperature

➤ **Drinking Water Treatment Processes**
Surface Water Treatment Rule

- Applies To Surface And Certain Ground Waters
- Removal Of Specific Microbes By 2-, 3-, And 4- Logs
- Monitoring Of Turbidity
- Watershed Protection
- General Principles Of Treatment
 - Coagulation
 - Alum
 - Synthetic Polymers
 - pH Dependence
 - Flocculation
 - Sedimentation
 - Filtration
 - Slow Sand Filters
 - Rapid Sand Filters
 - Granular-Media Filters
 - Bag Filters
 - Reverse Osmosis
 - Disinfection
 - Chlorine
 - Combined And Free Chlorine Residual
 - Breakpoint Chlorination

- pH
- Disinfection Byproducts
 - Trihalomethane
- Ozone
- Ultraviolet Light
- Concentration And Time
 - Disinfectant Concentration
 - Contact Time
 - pH
 - Temperature
 - Turbidity

➤ **Well Construction/Destruction**

- State Bulletin 74 And Its Amendments - Guidance
 - Annular Seal Placement
 - Casing
 - Packing
 - Pumps
 - Pump Curves
 - Cone Of Depression
 - Above Ground Features
 - Well Head
 - Sample Tap
 - Electrical Connections
 - Pitless Adaptor
 - Drilling Methods
 - Siting Considerations
 - Geological Formation
 - Surrounding Activities
 - Topography
 - Property Lines

❖ **Housing And Institutions**

Knowledge Of:

- **General Standards For Institutions (E.G., Jails, Prisons And Detention Facilities, Hospitals, Skilled Nursing**

Facilities, Shelters, Schools, Dormitories, Organized Camps)

- **State Laws And Legal Authority - Substandard Housing**
- **(State Housing Law, Applicable Sections Of California Code Of Regulations (CCR) In Title 17, Title 15 And Title 25, Uniform Housing Code)**
- **Disease Causation Related To Housing**
 - Indoor Air Pollutants
 - Radon
 - Molds
 - Asbestos
 - Formaldehyde
 - Carbon Monoxide
- **Housing Structure And Safety**
 - Basic Electrical
 - Basic Plumbing
 - Basic Structural
 - Structurally Sound
 - Safe Building Materials
 - Asbestos
 - Lead Based Paint
 - Lead Pipes/ Solder
 - Fire Safety
 - Safe Water Supply
 - Adequate Sewage Disposal
- **Maintenance And Occupancy Standards For Motels, Hotels, Apartments, Single Family Dwellings, Farm Worker Housing**
 - Trash And Debris Removal (Abandoned Refrigerators)
 - Lead Exposure (Paint, Soil)
 - Adequate Living Space
 - Control Communicable Disease
 - Infectious Respiratory Disease
 - Dermatitis
 - Mental Health

- Vectors And Pests
 - Cockroaches
 - Asthma
 - Rodents
 - Bed Bugs
 - Lice
 - Mites
- Ventilation And Heating

❖ Land Use

Knowledge Of:

- **State And Local Laws Regulating Land Use**
 - California Subdivision Map Act
 - California Environmental Quality Act (CEQA)
 - Drinking Water Quality And Quantity Standards
 - State Water Quality Control Board (SWQCB)
 - Regional Or Basin Plans
 - Local Planning Rules
 - Zoning Ordinances
 - Conditional Use Permits
 - General Plans
 - Flood Plain Maps
- **Toxicology**
 - Lead
 - Arsenic
 - Asbestos
 - Perchlorate
- **Land History Impact Of Prior Land Uses On Potential Land Uses**
 - Mining Activities
 - Underground Storage Of Liquids
 - Military Bases
 - Drug Labs
 - Cemeteries
 - Archeological Sites
 - Dump Site/Landfills

➤ **Drinking Water Quality And Quantity Standards**

- Minimum Water Quantity Requirements
 - Source
 - Storage
 - Distribution

➤ **SDWA**

- Primary And Secondary Standards

➤ **Sewage Disposal - Terms And Definitions**

- Geology
- Watershed Management
- Hydrology
- Wetlands
- Topography
- Soil Morphology
- Hydrogeologic Cycle Terms
 - Precipitation
 - Infiltration
 - Transpiration
 - Evaporation
- Eutrophication
- Water Table
- Artesian Spring
- Flood Plain
- Aquifer
- Aquitard
- Porosity
- Permeability
- Runoff
- Absorption

➤ **Noise**

- Principles Of Sound And Noise
 - Decibels
 - Logarithmic Progression
- Human Health Effects
- Noise Measurement
- Noise Control

❖ **Recreational Waters And Public Pools**

Knowledge Of:

- **State Laws And Regulations Regarding Public Swimming Pools And Recreational Waters CHSC, Sections 116025-116068; CCR; Title 17, Sections 7956-7962; Title 22, Chapter 20 And Title 24 (California Building Code), Chapter 31B, And Article 680; Wave Pool Safety Act**
- **Disease Causation-Etiological Agents And Diseases**
 - *Norovirus* / Rotaviruses
 - *Shigella*
 - *E. Coli*
 - *Giardia*
 - *Cryptosporidium*
 - *Legionella*
 - *Pseudomonas*
 - *Staphylococcus*
 - Dermatitis
 - Schistosomiasis (Swimmer's Itch)
 - Enterohemorrhagic Colitis
 - Gastroenteritis
 - Giardiasis
- **Water Sampling And Testing**
 - Pool Or Spa
 - Test Kits
 - Depth Of Sample
 - Location Of Sample
 - Amount Of Sample
 - Purpose Of Sodium Thiosulfate
 - Disinfectant Residual Amount
 - Labeling And Chain Of Custody
 - Pool Water Temperature At Sample Time
 - Spray Grounds/Wading Pools
 - Public Beaches
 - Sample Containers
 - Depth Of The Sample

- Sample Preservation
- Appropriate Indicator Organisms And Their Limitations
- Potential Impact Of Nearby Sources Of Pollution
 - Wastewater Treatment Facilities
 - Septic Systems
 - Storm Drains And Storm Water Runoff
 - Fresh Water Inflow
 - Animal Waste, Soil, And Vegetation
- Affect Of Ocean Waves And Tidal Action
- Freshwater Beaches
 - Total Coliform Bacteria
 - Fecal Coliform Bacteria
 - *Enterococcus* Species
 - Blue-Green Algae Species
- **Pool Chemistry**
 - pH
 - Ideal vs. Legal
 - How pH Affects Chemical Disinfectants
 - Sanitation
 - Chlorine
 - Ideal vs. Legal
 - Free Chlorine Residual Levels
 - Salt Chlorine Generators
 - Break Point Chlorination
 - Over Chlorination
 - Stabilizers (Cyanurates)
 - Gas Feeders
 - Chloramines
 - Definition Of
 - Control Methods
 - Effects
 - Bromine

- Ideal vs. Legal
 - Other Methods
 - Ozone
 - Hydrogen Peroxide
 - Ultraviolet (UV) Light
- Water Balance
 - Calcium Hardness
 - Total Alkalinity
 - Total Dissolved Solids
 - Temperature
 - Langelier Saturation Index
- **Closure Criteria**
 - Pool/Spa Closure
 - Authorizing Agent
 - Main Drain Broken Or Missing
 - No Free Chlorine
 - Turbidity (Cannot See The Bottom Of The Pool)
 - Broken Ladder Or Handrail
 - Lack Of Safety Equipment Or Signs
 - pH Outside Acceptable Range
 - Bacteria Level
 - Filtration Or Recirculation Equipment Not Functioning
 - Protocol For Fecal Accidents (CDPH Fact Sheet)
 - Beach Closure
 - Bacteria Level Exceeds State Standard
 - Sewage Discharge
 - Storm Water Discharge
- **Ancillary And Safety For Public Pools And Spas**
 - Shower Facilities
 - Toilet Facilities
 - Drinking Fountain
 - Safety Equipment
 - Fencing And Enclosures
 - Pool Decks

- Signage
- **Construction Criteria, Filtration And Circulation Systems**
 - Filtration
 - Types Of Filters
 - Diatomaceous Earth
 - Sand
 - Cartridge
 - Flow Rates/Filtration Rates
 - Flow Meters
 - Backwashing
 - Separation Tanks
 - Influent And Effluent Gauges
 - Turnover Rates
 - Circulation
 - Skimmers/Gutters
 - Surge Tank
 - Main Drains
 - Split For Wading Pools
 - Anti-Vortex / Anti-Entrapment Devices
 - Pumps
 - Operation And Maintenance
 - Cavitation
 - Slope
 - Steps, Handrails And Ladders, And Depth Markers
 - Bather Load
 - Filtration
 - Disinfectant Feeders
 - Emergency Shutoff (Spas)
 - Deck
 - Fencing/Gates
 - Circulation Equipment
 - Pump Size
 - Pipe Size
 - Turnover Rate
 - Drain Cover

- Lighting
- Backflow Prevention

❖ **Hazardous Materials And Hazardous Waste Management**

Knowledge Of:

➤ **Authority And Jurisdiction Federal And State Laws And Regulations Governing Hazardous Materials And Hazardous Waste)**

- Hazardous Waste
 - CHSC 25120-25250
 - CCR Title 22
- Certified Unified Program Agency (CUPA)
 - CHSC 25404-25404.8
- Hazardous Material Business Plans
 - CHSC 25500-25520
- California Accidental Release Program (Cal ARP)
- Spill Prevention And Countermeasure Control (SPCC)
- Aboveground Petroleum Storage Act (APSA)
- Underground Storage Tanks
 - CCR Title 23 (Applicable Sections)

➤ **Household Hazardous Materials/Waste**

- Identification
- Management
- Control

➤ **Hazardous Characteristics**

- Corrosive
- Ignitable
- Toxic
- Reactive
- Chemistry Terms Relative To Hazardous Materials/Waste
 - Volatile Organic Compounds
 - Heavy Metals
 - Oxidizers

- Reducers
- Corrosivity
- Ignitability
- Toxicity
- Carcinogens
- Reactivity
- Vapor Pressure
- Specific Gravity
- Boiling Point
- Flash Point
- Vapor Density

- Modes Of Chemical Exposure
 - Dermal
 - Inhalation
 - Ingestion
 - Injection

➤ **Permitting, Inspection And Registration**

- Storage Practices
 - Accumulation Limits
 - Time
 - Quantity
 - Labeling Requirements
 - Compatibility
 - Secondary Containment
 - Seismic Stability
 - Security
- On-Site Treatment and/or Disposal
- Employee Training And Safety Records
- Transportation Records

➤ **Sampling, Testing And Instrumentation**

- Sampling Protocols
 - Sample Size
 - Method
 - Containers
 - Transportation
- Testing And Monitoring Equipment

- Combustible Gas Meters
- Coliwasa Tubes
- Draeger Tubes
- Photoionization Detectors
- Hazcat Testing
- Interpret Laboratory Data
- Detection Limits
- QA / QC
- Spikes And Blanks
- Test Methods

➤ **Remediation And Site Clean-Up - Terms And Definitions**

- Plume Modeling
- Hydrogeologic Principles
- Chemical Transport
- Vadose Zone Monitoring

➤ **Hazard Communication**

- MSDS
- Community Right-To-Know
- Proposition 65

➤ **Occupational Health**

- Safe Working Conditions
 - Eight-Hour TWA
 - 15-Minute Short-Term Exposure Limit (STEL)
 - Permissible Exposure Level (PEL) And Immediately Dangerous To Life Or Health (IDLH)

❖ **Solid Waste And Medical Waste Management**

Knowledge Of:

➤ **State Laws Regulating Solid Waste Handling, Disposal, And Recycling**

- California Integrated Waste Management Act Public Resources Code (PRC)
- CCR Title 27 Sections 20510-20705
- CCR Title 14 Sections 17301-17350; 17400-17405

➤ **Landfill Operations And Principles**

- Daily Cover
- Alternative Daily Cover
- Compaction
- Erosion Control
- Vector Control
- Staff Training
- Employee Safety Equipment
- Litter Control
- Leachate Monitoring/Control
- Liner Systems
- Final Cover
- Landfill Gas Monitoring/Control
- Ground Water Monitoring

➤ **Transfer Station Operations**

- Load Check Procedures
- Material Recovery Facilities
- Vector Control
- Staff Training
- Employee Safety Equipment
- Litter Control
- Odor Control
- Recycling
- Record Keeping

➤ **Composting Operations**

- Load Check Procedures
- Vector Control
- Staff Training
- Employee Safety Equipment
- Litter Control
- Temperature Logs
- Odor Management Implementation Plan
- Sampling Requirements

➤ **Hazardous Waste At Solid Waste Facilities**

- Load Checking Procedures And Programs
- Universal Waste

- Electronic Waste
- **Additional Solid Waste Issues**
 - Permitting
 - CEQA
 - Financial Assurance
 - Local Enforcement Agency (LEA) And California Integrated Waste Management Board (CIWMB) Roles
 - Illegal Dumping
 - Closure And Post-Closure Land Use
 - Bioreactor Landfills
 - Landfill Gas To Energy Systems
- **State Laws Regulating Medical Waste Handling, Treatment, And Disposal**
 - Medical Waste Management Act
 - CHSC Sections 117600-118360
- **Bloodborne Pathogens And Acute Diseases Pertaining To Medical Waste**
 - Hepatitis
 - Human Immunodeficiency Virus (HIV)
 - Universal Precautions
 - Personal Protection
 - Use Of Proper Equipment
- **Medical Waste Management**
 - Medical Waste Plan
 - Time Tracking Of Removal
 - Waste Storage
 - On-Site Treatment
 - Disposal Tracking
 - Sharps
- ❖ **Vector Borne And Zoonotic Diseases**
Knowledge Of:
 - **Federal And State Laws**
 - Reporting Requirements Involving Animal Bites And
 - Zoonotic Diseases
 - Epidemiological Triangle
 - Disease Triad

- Disease Transmission
- Epidemic Theory
 - Host-Vector-Pathogen Transmission Cycles
 - Biological Transmission
 - Mechanical Transmission
- Definitions
 - Zoonoses
 - Reservoir
 - Host
 - Intermediary Host
 - Vector
 - Symbiosis
 - Parasites
 - Delusional Parasitosis
- **Identify Etiological Agent, Primary Host, Arthropod Vector, Mode Of Transmission, Major Organ System Affected, And Likely Exposure Circumstance For**
 - Arboviral Encephalitis (E.G., West Nile Fever)
 - Bubonic Plague
 - Chagas Disease
 - Lyme Disease
 - Malaria
 - Rickettsial Disease (e.g. Rocky Mountain Spotted Fever)
 - Tularemia
 - Typhus
 - Yellow Fever
- **Zoonotic Diseases**
 - *Hantavirus*
 - Histoplasmosis
 - Leptospirosis
 - Pneumonic Plague
 - Psittacosis
 - Rabies

➤ **Biology, Behavior, And Habitats**

- Bats
- Bed Bugs
- Cockroaches
- Fleas
- Flies
- Lice
- Mosquitoes
- Rodents
- Skunks
- Stinging Insects
- Ticks

➤ **Field Identification**

- Bed Bugs
- Ground Squirrels
- Mosquitoes
- Norway Rats
- Roof Rats
- Ticks

➤ **Sampling Procedures**

- Trapping Methods
 - Adult And Larval Mosquitoes
 - Blood Specimen Collection
 - Flea Combing Techniques
 - Live Flea And Tick Collection
- Proper Handling And Transporting Samples
 - Dead Bird Collection
 - Rabid Animal Carcass

➤ **Disease Control And Prevention
Animal/Vector**

- Knowledge Of Common Behaviors And Habitats
- Integrated Pest Management
- Proper Pesticide Application
 - Application Rate
 - Certified Pest Control Operator
 - Labeling
 - Warning Properties

❖ **Wastewater Management**

Knowledge Of:

➤ **State Laws Related To Wastewater Treatment And Disposal**

- SWQCB
 - Regional WQCB
- Porter-Cologne Water Quality Act
- Uniform Plumbing Code
- National Pollutant Discharge Elimination System (NPDES)
- Stormwater Pollution Prevention Plan (SWPPP)

➤ **Constituents Of Wastewater**

- Nitrates
- Coliform Bacteria
- Fecal Coliform Bacteria
- Total Dissolved Solids (TDS)
- Total Suspended Solids (TSS)
- Fats, Grease, And Oils
- Foaming Agents
- Biological Oxygen Demand
- Dissolved Oxygen
- Pharmaceuticals

➤ **Pathogens Found In Wastewater**

- Bacterial
 - Coliform
 - *Vibrio*
 - *Shigella*
- Protozoa
 - *Giardia*
 - *Cryptosporosus*
- Virus
 - Hepatitis
 - Norovirus

➤ **“Publicly Owned” Wastewater Treatment Processes (POTW)**

- Screening
- Primary Treatment
 - Digestion
 - Sedimentation

- Drying Beds
 - Biosolids
- Secondary Treatment
 - Trickling Filter
 - Activated Sludge
 - Aeration
 - Clarifier
- Tertiary Treatment
 - Disinfection
 - Chlorine
 - Ultraviolet
 - Ozone
- **Other Wastewater Treatment Processes**
 - Commercial / Industrial / Agricultural
 - Packaged Treatment Plants
- **Reclaimed And Recycled Water**
 - Definition/Uses
 - Irrigation Uses
 - Industrial Uses
 - Gray Water Systems
 - Control Measures
 - Cross-Connections
 - Color-Coded Pipes
- **On-Site Wastewater Treatment Systems**
 - Siting Considerations
 - Setbacks To Wells Property Lines, Drainage Courses, And Ground Water
 - Slope
 - Cut Banks And Fill
 - Parcel Size
 - Standard Septic System Components
 - Septic Tanks
 - Distribution Systems
 - D-Box
 - Valves

- Serial
- Drain Field
 - Perforated Pipe
 - Chamber Units
 - Seepage Pit
- Non-Standard Design
 - Mound Systems
 - Pressure Dosing Systems
 - Intermittent Sand Filter Systems
 - Aerobic Treatment Units
 - Packed-Bed Systems (E.G. Advantex)
 - Evapotranspiration Systems
- Construction Plans And Inspections
 - Design Plan Review
 - Hydraulic Calculations
 - Slope Calculation
 - Site Construction Inspection
 - Identifying System Failure
 - Fluorescein Dye Test
 - Surfacing Effluent
- **Soil Science Definitions**
 - Soil
 - Soil Texture
 - Sand
 - Silt
 - Clay
 - Loam
 - Bedrock/Fractured Rock
 - Permeability
 - Restrictive/Impermeable Layers
 - Seasonally Saturated Soil
 - Soil Mottling
- **Percolation Principles**
 - Pre-Soaking
 - Siting
 - Distribution
 - Calculations/Absorption Rate

➤ **Storm Water**

- Definition
- Pollution Of Water Courses
- Prevention Methods
 - Control Discharges To Storm Drains

❖ **Disaster Management**

Knowledge Of:

➤ **Emergency/Disaster Conditions**

- Natural And Man-Made Disasters
 - Pandemics
 - Earthquakes
 - Floods
 - Fires
 - Terrorism Events
 - Nuclear
 - Biological
 - Chemical

➤ **Emergency/Disaster Response**

- Incident Command System, National Incident Management System And State Incident Management System (NIMS/SIMS)
 - Risk Assessment
 - Damage Assessment
- Coordination Of Staff/Resources
 - Disaster Service Worker
 - Assignment Of Tasks
 - Responder Safety
 - Evacuation Planning
 - Mass Care And Shelter
 - Pet And Animal Shelter
- Emergency Notification

➤ **Disease Prevention And Control Measures**

- Drinking Water Supply
- Food Safety
- Mass Care And Shelter
- Solid Waste Disposal

- Wastewater Management
 - Portable Toilets
- Hazardous Material And Waste Management
- Medical Waste Management
 - Removal Of Dead Bodies/Animals
- Vector Control And Pest Management

➤ **Radiation Protection**

- Radiation Principles
 - Ionizing Radiation Vs. Non-Ionizing Radiation
 - Ionizing Radiation
 - Gamma Rays
 - Beta Particles
 - Alpha Particles
 - X-Rays
- Human Health Effects
 - Somatic
 - Genetic
 - Teratogenic
- Sampling And Monitoring Terms
 - Roentgen Equivalent Man (Rem)
 - Radiation Absorbed Dose (Rad)
 - Picocuries
 - Personal Dosimeter
 - Geiger Counters
 - Ionization Chamber
- Radiation Protection Principles
 - Time
 - Shielding
 - Distance
 - Quantity

❖ **Air Quality And Pollution Control**

Knowledge Of:

➤ **Jurisdiction And Authority, Federal And State Air Quality Laws And Regulations**

- Federal Clean Air Act
 - US Environmental Protection Agency (EPA)
- California Clean Air Act
 - California Air Resources Board
 - State Implementation Plans (SIP)
- Local Air Pollution Control Districts
- **Air Pollutants**
 - Primary Pollutants
 - Sulfur Dioxide
 - Nitrogen Oxide
 - Hydrocarbons
 - Carbon Monoxide
 - Carbon Dioxide
 - Toxic Air Contaminants
 - Lead
 - Volatile Organic Compounds (VOC)
 - Chlorofluorocarbons (Cfcs)
 - Particulate Matter (PM 10; PM 2.5)
 - Smoke
 - Dust
 - Pollen
 - Aerosols
 - Secondary Pollutants
 - Photochemical Smog
 - Hydrolysis
 - Oxidation
 - Acid Rain
- **Effects Of Air Pollutants On Human Health And The Environment**
 - Respiratory Diseases
 - Chronic Obstructive Pulmonary Disease (COPD)
 - Asthma
 - Cardiovascular Disease
 - Increased Medical Interventions
 - Ecological Damage

- Architectural Deterioration
- Reduced Crop Production
- **Indoor Air Quality (See Housing Section)**
- **Sampling And Testing Methods And Instruments**
 - Particulate Sampling
 - Gas Sampling
 - Smoke And Soiling Measurement
 - Ringelmann Smoke Chart
 - Tape Sampler
 - Stack Sampling
- **Control Measures**
 - Air Pollution Control Equipment
 - Particulate Collectors And Separators
 - Electrostatic Precipitators
 - Cyclone
 - Air Scrubbers
 - Carbon Filtration
 - Thermal and catalytic oxidizers
 - Settling chambers
 - Sonic collectors
 - Filters
 - Baghouse filters
 - Cloth-screen filters
 - Gaseous Collectors and Treatment Devices
 - Thermal converter
 - Catalytic converter
 - Condensers
 - Adsorption/Absorption
 - Vapor conservation
- **Climate Change**
 - Greenhouse gases
 - Carbon dioxide emissions
 - Ozone depletion
 - CFC

SAMPLE QUESTIONS

General Math And Science Knowledge

1. The Inverse Square Law is commonly used in which environmental health program areas to calculate the intensity or strength of a substance at a specified distance from the point source?
 - a. radiation, lighting, and noise
 - b. noise, air emissions, and radiation
 - c. radiation, fluoridation in water, lighting, and noise
 - d. lighting, sewage contamination in stream, and air emissions
2. If $15x + 3 = 7x - 13$, then x equals
 - a. 2.0
 - b. +2.0
 - c. +2.5
 - d. +4.0

Investigations And Inspections Process

3. What is the legal term which describes the failure to perform an official duty as an Environmental Health Specialist without sufficient excuse?
 - a. malfeasance
 - b. misfeasance
 - c. nonfeasance
 - d. criminal responsibility

4. In the field of public health law, state government's police power is an attribute of a sovereign government, whereas the federal government is a government of
 - a. absolute police power.
 - b. delegated police power.
 - c. limited delegated powers.
 - d. constitutional police power.
5. An epidemiological study which follows a group of people over time is a _____ study.
 - a. regressive
 - b. prospective
 - c. progressive
 - d. retrospective
6. A sample collected over a short time period where the atmospheric concentration is assumed to be consistent throughout the sample period is called a(an) _____ sample.
 - a. grab
 - b. small
 - c. partial
 - d. integrated

Food And Consumer Protection

7. Adequate cooking will not always prevent *Clostridium perfringens* food poisoning because
 - a. the enterotoxin is heat stable.
 - b. the spores are heat-resistant and may survive.
 - c. it is a rapidly growing pyrophilic organism.
 - d. incomplete heat distribution results in new bacterial colony formation.

SAMPLE QUESTIONS

Drinking Water

8. The level that a vacuum breaker must be installed above the flood rim of the fixture or receptacle it is serving is called the _____ level.
- a. installation
 - b. anti-siphoned
 - c. critical
 - d. backflow

Hazardous Materials And Waste Management

9. Pursuant to the California Right to Know Law, facilities that handle hazardous materials are primarily required to submit
- a. Material Safety Data Sheets.
 - b. a business plan.
 - c. a list of all hazardous materials.
 - d. a list of all acutely hazardous materials.

Solid Waste And Medical Waste Management

10. The Paint Filter Liquid Test is used at landfills to determine
- a. the soil permeability of cover material.
 - b. the sludge content of incoming waste.
 - c. if leachates have been formed.
 - d. if wastes may be landfilled.

Wastewater Management

11. Which statement about hydraulic conductivity in soils is true?
- a. Hydraulic conductivity increases for all soils as they dry.
 - b. Soils with small, discontinuous water-filled pores have high hydraulic conductivity.
 - c. Unsaturated soils with large air-filled pores have a high hydraulic conductivity.
 - d. As soils dry, the hydraulic conductivity of clay soils can become greater than that of sandy soils.

Recreational Waters And Public Pools

12. Assuming a high-rate sand filter is operated at 15 gallons per minute per square foot, the minimum size filter needed for a 36,000 gallon swimming pool operating with a six-hour turnover rate is _____ square feet.
- a. 6.67
 - b. 12.72
 - c. 23.33
 - d. 40.01

Disaster Management

13. In the event of a natural disaster, the safest source of drinking water would be from a(an)
- a. toilet tank.
 - b. open cistern.
 - c. water heater.
 - d. swimming pool.

SAMPLE QUESTIONS

14. Radon does not have the characteristic of

- a. being known to cause cancer.
- b. having a long half-life.
- c. having the ability to enter homes through a water well.
- d. occurring naturally in the soil.

Pest And Vector Control

15. The causative agent of Weil's Disease resulting from direct or indirect contact with the infected urine of rodents and certain other animals is _____ spp.

- a. *Yersinia*
- b. *Leptospira*
- c. *Rickettsia*
- d. *Wuchereria*

Air Quality

16. Inhalation of asbestos fibers may cause asbestosis,

- a. cancer, and mesothelioma.
- b. eye irritation, and skin rash.
- c. coughing, and pulmonary edema.
- d. lymphothelioma, and sensitization.

17. The problems associated with pneumoconiosis are not heavily influenced by the

- a. rate of pressure rise.
- b. size of dust particles.
- c. length of particle exposure.
- d. concentration of airborne dusts.

Housing And Institutions

18. The determination of overcrowding in residential units is based on the number of persons per

- a. bedroom.
- b. net square feet of habitable room.
- c. gross square feet of residential unit.
- d. cubic feet of airspace in dwelling unit.

Land Use

19. Two identical pumps located side-by-side produce a sound level of 80 dBA at a distance of 10 feet. If one of the pumps is turned off, the sound level at 10 feet is _____ dBA.

- a. 40
- b. 70
- c. 77
- d. 80

20. Which situation best describes an incompatible land-use?

- a. One property is adversely impacted by the environmental pollutants generated on an adjacent parcel.
- b. The value of one property is greatly increased because of the presence of a more valuable land-use for nearby property or properties.
- c. The land-use allowed on one property adversely affects the health of the residents on an adjacent property.
- d. The land-use allowed on one parcel or property adversely impacts or restricts the use of an adjacent or nearby property or properties.

Sample Questions Answer Key

1. **A**
2. **A**
3. **C**
4. **C**
5. **B**
6. **A**
7. **B**
8. **C**
9. **B**
10. **D**
11. **D**
12. **A**
13. **C**
14. **B**
15. **B**
16. **A**
17. **A**
18. **B**
19. **D**
20. **C**