



SERVICE POOL CONTRACTORS GENERAL TRADE KNOWLEDGE EXAMINATION CONTENT INFORMATION

Revised March 2009

The General Trade Knowledge examination will be administered in one session on the morning of the first day of the examination administration. It will consist of 60 equally weighted questions.

The examination will have questions relating to the following content areas and necessary knowledge for each area includes:

- reading and interpreting plans and specifications
- reading and interpreting codes
- basic mathematics (addition, subtraction, multiplication, division, calculations of area and volume, fractions, decimals, percentages, calculating the sides of triangles, square roots, powers of numbers, and solving simple algebraic equations for unknown variables)

You should be prepared to respond to examination questions on any of the content areas listed. Questions asked and content areas tested on previous examinations should not be assumed to be the only possible questions to be asked or content areas to be tested on this examination.

The percentage of questions shown for each content area may vary by as much as plus or minus three (3) percent. Please refer to the Candidate Information Brochure and the Reference List for additional information.

Content Area A **10%** **Plumbing Work**

- 1. Replacing and repairing recirculating lines**
 - knowledge of piping materials and applications
 - knowledge of placement
 - knowledge of associated fittings
 - knowledge of valve requirements
 - knowledge of related components
- 2. Pressure testing recirculating lines**
 - knowledge of theory

knowledge of psi's
knowledge of hook-up and placement
ability to understand test results
knowledge of dangers of pressure plugs
knowledge of open trench inspections
knowledge of pressure testing techniques
knowledge of the dangers of pressurized lines

3. Replacing and repairing filter equipment

knowledge of filtration requirements
knowledge of type of filters
knowledge of gauges and valves
knowledge of placement of pumps
knowledge of types and capacities of motors
knowledge of piping requirements
knowledge of flow rates and piping pressures
knowledge of inlets and outlets

4. Replacing and repairing pumps

knowledge of filtration requirements
knowledge of types of pumps and pump loads
knowledge of grounding
knowledge of piping techniques and requirements
knowledge of pressures and flow requirements

5. Replacing and repairing skimmers

knowledge of filtration requirements
knowledge of types of skimmers
knowledge of skimmer housings
knowledge of strainer baskets
knowledge of weirs and valves
knowledge of vacuum cleaning connections
knowledge of flow rates, pressures, and overflow systems

6. Installing solar heaters

knowledge of solar heating requirements and practices
knowledge of solar collectors
knowledge of piping techniques and requirements
knowledge of pipe fittings
knowledge of control requirements
knowledge of pump requirements

7. Installing conventional heaters (gas, heat pump, electric)

knowledge of state and local codes
knowledge of location requirements
knowledge of fire and gas codes
knowledge of sizing and flow rates
knowledge of heat exchangers for gas heaters
knowledge of location of L.P. Gas tanks for gas heaters
knowledge of heat pumps for electric heaters
knowledge of immersion elements for electric heaters

8. Installing automatic cleaners

knowledge of piping requirements
knowledge of pipe fitting
knowledge of fittings
knowledge of pumps
knowledge of filtration requirements
knowledge of materials
knowledge of processes for automatic feeders

9. Installing automatic feeders

knowledge of piping techniques and requirements
knowledge of pipe fitting requirements
knowledge of pipe fitting
knowledge of pipe materials
knowledge of processes for automatic feeders

10. Sizing pipes

knowledge of hydraulics

**Content Area B
Deck Work**

10%

1. Repairing wood decks

knowledge of pressure treated wood
knowledge of other wood protection
knowledge of carpentry
knowledge of carpentry tools
knowledge of foundations

2. Repairing concrete decks

knowledge of concrete properties
knowledge of concrete reinforcement
knowledge of concrete placement
knowledge of concrete finishing
knowledge of form work
knowledge of expansion and contraction protection
knowledge of drainage and slope
knowledge of drains and plumbing
knowledge of deck finishes

3. Repairing masonry type decks (tile, stone, and brick)

knowledge of sub-base materials
knowledge of work requirements
knowledge of work placement
knowledge of drainage and slope
knowledge of drains and plumbing

Content Area C

10%

Tile, Coping and Trim Work

1. Replacing and repairing tiles

knowledge of material properties
knowledge of specific handling requirements
knowledge of measurements
knowledge of measuring equipment
knowledge of types of grouts and requirements
knowledge of adhesive requirements
knowledge of mortar requirements
knowledge of cleaning
knowledge of leveling techniques and requirements
knowledge of architectural effects

2. Replacing and repairing masonry trims (brick, stone, and precast coping)

knowledge of material properties
knowledge of specific handling requirements
knowledge of measurements
knowledge of measuring equipment
knowledge of types of grouts and requirements
knowledge of adhesive requirements
knowledge of mortar requirements
knowledge of cleaning
knowledge of leveling techniques and requirements
knowledge of architectural effects
knowledge of mitering

3. Checking for level placement of materials

knowledge of leveling equipment
knowledge of leveling techniques and requirements

4. Replacing and repairing gutters

knowledge of leveling
knowledge of slopes
knowledge of concrete
knowledge of marcite
knowledge of tile
knowledge of plumbing
knowledge of inlets and outlets
knowledge of form work

5. Checking code requirements

**Content Area D
Accessory Work**

10%

1. Replacing and repairing electrical components

knowledge of local and state codes
knowledge of automatic timers
knowledge of lights
knowledge of electrical connections to chlorinating generators

2. Installing diving boards and diving platforms

knowledge of materials for diving boards
knowledge of installation requirements
knowledge of safety requirements
knowledge of proper placement

3. Installing slides

knowledge of materials for slides
knowledge of installation requirements
knowledge of proper placement

4. Installing auxiliary lighting

knowledge of fiber optic lighting
knowledge of low voltage accent lighting

5. Installing alternate sanitation devices

knowledge of different types of devices

Content Area E

10%

Interior Surface Preparation and Finishing

1. Performing interior pool and spa clean-ups

knowledge of drawdown
knowledge of possible uplift
knowledge of chemicals
knowledge of cleaning solutions
knowledge of cleaning procedures
knowledge of safety requirements
knowledge of disposal requirements

2. Performing interior pool and spa plastering of pneumatically placed or poured concrete pools

knowledge of gunite materials, procedures, and requirements
knowledge of shotcrete materials and procedures
knowledge of concrete requirements
knowledge of concrete testing
knowledge of concrete properties
knowledge of form work
knowledge of finishing and brazing

3. Installing lining in vinyl-lined pools

knowledge of materials
knowledge of methods
knowledge of soils
knowledge of retaining walls
knowledge of coping
knowledge of leveling and installing
knowledge of anchoring

**Content Area F
Start Up**

10%

1. Pre-testing fill water

knowledge of water chemistry
knowledge of testing procedures and requirements
knowledge of reagents
knowledge of saturation
knowledge of pH
knowledge of total alkalinity
knowledge of hardness

2. Testing filters and filtration

knowledge of pressurizing procedures and requirements
knowledge of turnover rates
knowledge of pumps
knowledge testing procedures

3. Balancing pool water

knowledge of water chemistry
knowledge of testing procedures and requirements
knowledge of solutions
knowledge of reagents
knowledge of saturation
knowledge of pH
knowledge of total alkalinity
knowledge hardness
knowledge of disinfecting
knowledge of sanitizing
knowledge safety requirements
knowledge of chemical dangers

4. Starting pool and spa auxiliary equipment

knowledge of equipment specifications
knowledge of system design

5. Testing heating equipment

knowledge of wiring
knowledge of fuels
knowledge of solar input
knowledge of testing procedures
knowledge of temperature measurement
knowledge of system design

6. Testing pump sections

knowledge of testing procedures
knowledge pump requirements
knowledge of system design

7. Performing exterior pool and spa clean-ups

knowledge of material procedures
knowledge of safety requirements

Service and Maintenance

1. Demonstrating pool operation to owners

knowledge of mechanical and hydraulic systems
knowledge of chemical systems
knowledge of general pool care requirements
knowledge of communicating safety requirements
knowledge of equipment
knowledge of communication skills
knowledge of daily reports

2. Sanitizing pools and spas through chlorination

knowledge of water chemistry
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of practices of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating requirements
knowledge of chlorinating procedures
knowledge of chemical balancing techniques and requirements
knowledge of testing techniques and requirements
knowledge of reagents
knowledge of adjusting techniques and requirements

3. Performing shock treatments or super-chlorinations

knowledge of water chemistry
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating requirements
knowledge of chlorinating procedures and techniques
knowledge of chemical balancing
knowledge of testing techniques and requirements
knowledge of reagents
knowledge of adjusting techniques and requirements

4. Determining breakpoint chlorinations

Content Area G

35%

knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of practices of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating requirements
knowledge of chlorinating procedures
knowledge of chemical balancing techniques
and requirements
knowledge of testing techniques and
requirements
knowledge of reagents
knowledge of adjusting techniques and
requirements

5. Sanitizing pools and spas through oxidation

knowledge of effects of pool chemicals
knowledge of practices of pool chemicals
knowledge of safety requirements
knowledge of chemical balancing techniques
and requirements
knowledge of testing techniques and
requirements
knowledge of reagents
knowledge of adjusting techniques and
requirements

6. Checking accurate turbidity

knowledge of testing techniques and
requirements
knowledge of reagents
knowledge adjusting techniques and
requirements

7. Testing and adjusting pH values

knowledge of water chemistry
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating requirements
knowledge of chlorinating procedures
knowledge of chemical balancing techniques
and requirements
knowledge of testing techniques and
requirements
knowledge of reagents
knowledge of adjusting techniques and
requirements

8. Testing and adjusting water hardness

knowledge of water chemistry
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of practices of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating requirements
knowledge of chlorinating procedures
knowledge of chemical balancing techniques
and requirements
knowledge of testing techniques and
requirements
knowledge of reagents
knowledge of adjusting techniques and
requirements

9. Testing and adjusting total alkalinity

knowledge of water chemistry
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating requirements
knowledge of chlorinating procedures
knowledge of chemical balancing techniques
and requirements
knowledge of testing techniques and
requirements
knowledge of reagents
knowledge of adjusting techniques and
requirements

10. Testing and adjusting cyanuric acid

knowledge of water chemistry
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating requirements
knowledge of chlorinating procedures
knowledge of chemical balancing techniques
and requirements
knowledge of testing techniques and
requirements
knowledge of reagents
knowledge of adjusting techniques and
requirements

11. Testing and adjusting metals

knowledge of water chemistry
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of safety requirements
knowledge of dangers of chlorinating agents
knowledge of chlorinating procedures
knowledge of chemical balancing techniques and requirements
knowledge of testing techniques and requirements
knowledge of reagents
knowledge of adjusting techniques and requirements

12. Cleaning D.E. filters by pressure backwashing and jet spraying

knowledge of system design
knowledge of pump requirements
knowledge of flow rates
knowledge of safety requirements
knowledge of testing procedures
knowledge of water clarity
knowledge of gauges
knowledge of drainage
knowledge of valves

13. Backwashing sand filters

knowledge of system design
knowledge of pump requirements
knowledge of flow rates
knowledge of safety requirements
knowledge of testing procedures
knowledge of water clarity
knowledge of gauges
knowledge of drainage
knowledge of valves

14. Using sodium hypochlorite for disinfecting and deck cleaning

knowledge of safety requirements
knowledge of chemical properties
knowledge of mixing procedures
knowledge of filtration requirements
knowledge of chemical effects
knowledge of chemical balancing techniques and requirements
knowledge of storage procedures and requirements

15. Using calcium hypochlorite to sanitize decks and locker rooms

knowledge of safety requirements
knowledge of chemicals
knowledge of chemical properties
knowledge of mixing procedures
knowledge of filtration requirements
knowledge of filtration media
knowledge of chemical effects
knowledge of chemical balancing techniques and requirements
knowledge of storage procedures and requirements

16. Using other pool sanitizers (e.g., bromine, iodine, ozone, ultraviolet, silver and electrolytic cells)

knowledge of safety requirements
knowledge of chemicals
knowledge of chemical properties
knowledge of mixing procedures
knowledge of filtration requirements
knowledge of filtration media
knowledge of chemical effects
knowledge of chemical balancing techniques and requirements
knowledge of storage procedures and requirements

17. Using other pool chemicals (e.g., flocculents, algicides, sequestering agents, degreasers and defoamers)

knowledge of safety requirements
knowledge of chemicals
knowledge of chemical properties
knowledge of mixing procedures
knowledge of filtration requirements
knowledge of filtration media
knowledge of chemical effects
knowledge of chemical balancing techniques and requirements
knowledge of storage procedures and requirements

18. Testing and adjusting water saturation and undersaturation

knowledge of water chemistry
knowledge of pH
knowledge of pool chemicals
knowledge of effects of pool chemicals
knowledge of safety requirements
knowledge of chlorinating techniques and procedures
knowledge of chemical balancing techniques and requirements
knowledge of testing procedures
knowledge of reagents
knowledge of adjusting procedures

19. Knowledge of the effect of chemical balances on staining

knowledge of safety requirements
knowledge of chemicals
knowledge of chemical properties
knowledge of mixing procedures
knowledge of chemical effects
knowledge of storage procedures and requirements

20. Replacing light bulbs and underwater lights

knowledge of different voltage lights
knowledge of proper safety procedures and requirements
knowledge of pressure and suction factors
knowledge of importance of GFIR
knowledge of safe wiring and sealing water out
knowledge of material specifications
knowledge of bonding and grounding requirements

21. Utilizing pool blankets and covers

knowledge of materials and types
knowledge of the properties of materials
knowledge of safety requirements
knowledge of installation
knowledge of securing installation
knowledge of chemical balance effects

22. Installing markers and signs to notify the public of safety procedures

knowledge of safety requirements
knowledge of placement
knowledge of location

23. Maintaining and repairing plumbing equipment

knowledge of safety requirements
knowledge of piping requirements
knowledge of fittings
knowledge of pipe fittings
knowledge of piping protection
knowledge of pressure requirements
knowledge of gauges
knowledge of pressure testing
knowledge of flow rates
knowledge of pumps
knowledge of leak detection

24. Maintaining and repairing decks

knowledge of bonding new material to old
knowledge of cleaning in preparation for repair
knowledge of safety requirements
knowledge of expansion joints
knowledge of codes
knowledge of maintaining strength of the deck
knowledge of soil conditions
knowledge of compaction
knowledge of concrete placement

25. Maintaining and repairing accessory fixtures

knowledge of safety requirements
knowledge of solar heating
knowledge of conventional heating
knowledge of materials
knowledge of the properties of materials
knowledge of procedures
knowledge of material handling
knowledge of system design
knowledge of system design capacity

26. Maintaining and repairing pool shells

knowledge of leak detection
knowledge of leak testing
knowledge of safety requirements
knowledge of materials
knowledge of the properties of materials
knowledge of crack repair procedures

27. Evaluating and adjusting system requirements

knowledge of system design

checking for correct turnover rate

- knowledge of testing techniques and requirements
- knowledge calculating turnover rate
- knowledge of adjusting techniques and requirements

checking for effectiveness of filtering media

- knowledge of system design
- knowledge of pump requirements
- knowledge of flow rates
- knowledge of safety requirements
- knowledge of testing procedures
- knowledge of water clarity
- knowledge of gauges
- knowledge of drainage
- knowledge of valves

testing and adjusting for water clarity

- knowledge of water chemistry
- knowledge of pH
- knowledge of pool chemicals
- knowledge of effects of pool chemicals
- knowledge of practices of pool chemicals
- knowledge of dangers of chlorinating agents
- knowledge of chlorinating requirements
- knowledge of chlorinating procedures
- knowledge of chemical balancing techniques and requirements
- knowledge of testing techniques and requirements
- knowledge of reagents
- knowledge of adjusting techniques and requirements

checking and clearing outlet strainers

- knowledge of system design
- knowledge of pump requirements
- knowledge of flow rates
- knowledge of safety requirements
- knowledge of testing procedures
- knowledge of gauges
- knowledge of drainage
- knowledge of valves

28. Cleaning cartridge filters

knowledge of system design

knowledge of pump requirements

knowledge of flow rates

knowledge of safety requirements

knowledge of testing procedures

knowledge of water clarity

knowledge of gauges

knowledge of drainage

knowledge of valves

29. Performing heater care and maintenance

checking heaters or heating systems for efficiency

- knowledge of safety requirements
- knowledge of testing procedures and requirements

knowledge of system design

performing heater sizing

- knowledge of safety requirements
- knowledge of system design
- knowledge of system capacity

checking thermostats

- knowledge of temperature measurements
- knowledge of effects of temperature
- knowledge of changes in temperature

knowledge of effects of water chemistry on heater components

knowledge of pool chemistry

knowledge of gas and electric requirements

knowledge of safety requirements

Content Area H

5%

Safety Procedures

1. Complying with state and federal requirements

knowledge of local codes

2. Implementing a safety program

3. Utilizing accident prevention techniques

knowledge of storage procedures

knowledge of safety requirements

knowledge of transportation requirements and procedures

knowledge of pool closure procedures