TEST TAKING TIPS & TRICKS

Jeffrey C. McBurnie, PE
Casella Organics, Director of Permitting & Regulatory Affairs

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OVERVIEW

• **Test Taking Psychology – Get Your Head on Straight**
• **Preparation – All Aspects**
• **Execution – Tips & Tricks**
• **Example: Math**
Disclaimer: Not a trained or licensed psychologist

Some of the Biggest Obstacles to Test Taking Success are Mental

• I’m a horrible test taker
• I hate math
• I freeze up or panic

Self-inflicted or Engrained in Earlier Education

If You Don’t Think You Can, You Won’t
Don’t Say You Can’t, Say You’ll Try
How can you remove this psychological barrier?
Build your Confidence
How do you Build Confidence?
Prepare, prepare, prepare

PREPARATION LEADS TO CONFIDENCE WHICH LEADS TO SUCCESS
PSYCHOLOGY

Sounds simple enough, but how do I actually do this?

First understand your Motivation

What is your Mindset?

Pride in accomplishment or Fear of loss

Goal Line vs Guilt/lotine
PREPARING FOR THE EXAM

• Study, Study, and Study Some More
  • Studying for A Certification Exam is like Voting in Chicago
    • Do it early, do it often
  • Studying is ALSO Like a Eating Buffet Dinner
    • Pace yourself
  • Focus on your Areas of Weakness, but Don’t Ignore the Basics
  • Studying is the First Step in Building Confidence
PREPARING FOR THE EXAM

• Identify the Important Subject Matter
  • Reference Books & Study Guides
    • AWWA & WEF
    • Univ. of California - Sacramento
  • Association of Boards of Certification (ABC)
    • Practice Test Questions
    • Need-to-Know Criteria
    • Math Formulas and Conversions
  • Past Test Experience
Recall – tasks at this level typically require the simple recall or recognition of specific facts, concepts, processes, or procedures, with little to no problem-solving involved. You may be asked to identify, illustrate, recall, and/or recognize specific information.

Application – tasks at this level will involve some basic problem solving, calculations, or the interpretation and application of data. You may be asked to calculate, categorize, classify, compare, differentiate, explain, specify, translate, and/or apply knowledge.

Analysis – tasks at this level may involve higher level problem solving, evaluation, or the fitting together of a variety of elements into a meaningful whole; they will usually require many steps in the thought process. You may be asked to analyze, evaluate, formulate, generalize, judge, predict, and/or use inductive or deductive reasoning to arrive at a solution.

### Exam Content Outline

<table>
<thead>
<tr>
<th>Number of Questions</th>
<th>Content Area</th>
<th>Job Task Complexity Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>Treatment Process</td>
<td>8</td>
</tr>
<tr>
<td>14</td>
<td>Laboratory Analysis</td>
<td>5</td>
</tr>
<tr>
<td>24</td>
<td>Equipment Operation &amp; Maintenance</td>
<td>7</td>
</tr>
<tr>
<td>11</td>
<td>Source Water Characteristics</td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>Security, Safety, Compliance, &amp; Administrative Procedures</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

*Your exam may contain up to 10 extra unscored pre-test questions (see Before You Dive In for more details).*
Basic - A fundamental or lower level of knowledge is required. Operators performing tasks requiring this level of knowledge will be able to do so with some training; this level of knowledge may also be acquired and developed through job experience. Such tasks may be routine, utilizing established procedures, and have a low level of complexity. Not having this level of knowledge will have minimal impact or significance on the performance of the tasks listed in the Content Area, or on public safety and welfare.

Intermediate - A level of knowledge beyond the basic level is required. Operators performing tasks requiring this level of knowledge will be able to do so with training beyond that of the basic level. The operator will not only be able to apply required fundamental concepts, but will be able to understand and discuss the application and implications of changes to processes, policies, and procedures within the Content Area. Not having this level of knowledge will have a significant impact on the performance of the job and on public safety and welfare.

Advanced - A very high level of knowledge/job expertise is required and the operator will be functioning at an expert level. The operator can apply all fundamental, as well as highly developed or complex concepts, and will be able to design, review, and evaluate processes, policies, and procedures within the Content Area. Not having this level of knowledge will have a serious impact on the performance of the job and will be very harmful to public safety and welfare.

<table>
<thead>
<tr>
<th>Supporting Knowledge Type</th>
<th>Treatment Process (31%)</th>
<th>Laboratory Analysis (14%)</th>
<th>Equipment Operation &amp; Maintenance (24%)</th>
<th>Source Water Characteristics (11%)</th>
<th>Security, Safety, Compliance, &amp; Administrative Procedures (29%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arithmetic (e.g., measurements and calculations)</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Biology (e.g., pathogenic organisms)</td>
<td>Basic</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Chemistry (e.g., water chemistry)</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Chemical dosing (coagulants, oxidants, disinfectants, acids and bases)</td>
<td>Intermediate</td>
<td></td>
<td>Intermediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical feed equipment (e.g., liquid, solid, gases)</td>
<td>Intermediate</td>
<td></td>
<td>Intermediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical properties (e.g., reactivity, compatibility, pH)</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contaminants (e.g., organic, inorganic)</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disciplinary procedures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General electrical principles (e.g., troubleshooting, breakers, relays, circuits)</td>
<td>Intermediate</td>
<td></td>
<td>Intermediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal combustion engines</td>
<td></td>
<td></td>
<td>Intermediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laboratory equipment (e.g., glassware)</td>
<td>Intermediate</td>
<td></td>
<td>Intermediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laboratory instrumentation (e.g., operation, and calibration)</td>
<td>Intermediate</td>
<td></td>
<td>Intermediate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PREPARING FOR THE EXAM

• Preparing Your Toolbox
  • Formulas and Conversions are Your Math Solving Tools
  • You will be Supplied with All the Tools You Need
  • You should Know What Tools You Have
  • You should Know How to Use Those Tools

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Alkalinity, mg/L as CaCO₃ = \( \frac{(\text{Titrant Volume, mL})(\text{Acid Normality})(50,000)}{\text{Sample Volume, mL}} \)

\[ \text{Amps} = \frac{\text{Volts}}{\text{Ohms}} \]

\[ \text{Area of Circle}^* = (0.785)(\text{Diameter}^2) \]

\[ \text{Area of Circle} = (3.14)(\text{Radius}^2) \]

\[ \text{Area of Cone (lateral area)} = (3.14)(\text{Radius})\sqrt{\text{Radius}^2 + \text{Height}^2} \]

\[ \text{Area of Cone (total surface area)} = (3.14)(\text{Radius})(\text{Radius} + \sqrt{\text{Radius}^2 + \text{Height}^2}) \]

\[ \text{Area of Cylinder (total exterior surface area)} = [\text{End #1 SA}] + [\text{End #2 SA}] + [(3.14)(\text{Diameter})(\text{Height or Depth})] \]

\[ \text{Area of Rectangle}^* = (\text{Length})(\text{Width}) \]

\[ \text{Area of Right Triangle}^* = \frac{(\text{Base})(\text{Height})}{2} \]

Average (arithmetic mean) = \( \frac{\text{Sum of All Terms}}{\text{Number of Terms}} \)
### Conversion Factors

<table>
<thead>
<tr>
<th>Unit</th>
<th>Conversion Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 acre</td>
<td>= 43,560 ft²</td>
</tr>
<tr>
<td>1 acre foot of water</td>
<td>= 326,000 gal</td>
</tr>
<tr>
<td>1 cubic foot of water</td>
<td>= 7.48 gal</td>
</tr>
<tr>
<td>1 cubic foot per second</td>
<td>= 0.646 MGD</td>
</tr>
<tr>
<td>1 cubic meter of water</td>
<td>= 1,000 kg</td>
</tr>
<tr>
<td>1 foot</td>
<td>= 0.305 m</td>
</tr>
<tr>
<td>1 foot of water</td>
<td>= 0.433 psi</td>
</tr>
<tr>
<td>1 gallon (US)</td>
<td>= 3.785 L</td>
</tr>
<tr>
<td>1 grain per US gallon</td>
<td>= 17.1 mg/L</td>
</tr>
<tr>
<td>1 hectare</td>
<td>= 10,000 m²</td>
</tr>
<tr>
<td>1 horsepower</td>
<td>= 0.746 kW</td>
</tr>
<tr>
<td>1 inch</td>
<td>= 2.54 cm</td>
</tr>
<tr>
<td>1 liter per second</td>
<td>= 0.0864 MLD</td>
</tr>
<tr>
<td>1 meter of water</td>
<td>= 9.8 kPa</td>
</tr>
<tr>
<td>1 metric ton</td>
<td>= 2,205 lb</td>
</tr>
<tr>
<td>1 mile</td>
<td>= 5,280 ft</td>
</tr>
<tr>
<td>1 million US gallons per day</td>
<td>= 694 gpm</td>
</tr>
<tr>
<td>1 pound</td>
<td>= 0.454 kg</td>
</tr>
<tr>
<td>1 pound per square inch</td>
<td>= 2.31 ft of water</td>
</tr>
<tr>
<td>1 square meter</td>
<td>= 1.19 yd²</td>
</tr>
<tr>
<td>1 ton</td>
<td>= 2,000 lb</td>
</tr>
<tr>
<td>1%</td>
<td>= 10,000 mg/L</td>
</tr>
<tr>
<td>π or π</td>
<td>= 3.14</td>
</tr>
</tbody>
</table>

### Alkalinity Relationships

All Alkalinity expressed as mg/L as CaCO₃  ●  P – phenolphthalein alkalinity  ●  T – total alkalinity

<table>
<thead>
<tr>
<th>Result of Titration</th>
<th>Hydroxide Alkalinity</th>
<th>Carbonate Alkalinity</th>
<th>Bicarbonate Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>P = 0</td>
<td>0</td>
<td>0</td>
<td>T</td>
</tr>
<tr>
<td>P &lt; ½T</td>
<td>0</td>
<td>2P</td>
<td>T – 2P</td>
</tr>
<tr>
<td>P = ½T</td>
<td>0</td>
<td>2P</td>
<td>0</td>
</tr>
<tr>
<td>P &gt; ½T</td>
<td>2P – T</td>
<td>2(T – P)</td>
<td>0</td>
</tr>
<tr>
<td>P = T</td>
<td>T</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Pie Wheel Format for this equation is available at the end of this document*
PREPARING FOR THE EXAM

• Prepare Yourself Physically
  • Go to the Exam Well Rested
    • Main Reason Why Cramming Rarely Works
    • Party (Celebrate) After You Pass
  • Maintain Balance in Your Life
    • Dropping Everything Just to Study may not be Effective
    • Healthy Diet & Exercise
  • Manage Stress and Distractions
    • Often Out of Your Control, but Do Your Best
PREPARING FOR THE EXAM

PREPARATION →

CONFIDENCE →

TRANQUILITY...& SUCCESS!
EXECUTING AT TEST TIME

Tip: Although referred to as a multiple choice test, it is actually a best answer test.

Because there can only be one right (best) answer, we can use the process of elimination to improve our chances of selecting the correct choice.

• If two choices are similar, neither is the answer
• If two choices are direct opposites, one of them is likely the correct answer
EXECUTING AT TEST TIME

Tip: You can think of the certification exam as a vocabulary test. If you are familiar with the words (or processes, or equipment), you are better equipped to select the right answer.

• Once again, you can use the process of elimination to improve your probability of choosing correctly
• I don’t know what it is, but I know what it’s not
  • Treatment Chemicals
  • Laboratory Equipment
  • Pipe Fittings & Appurtenances
EXECUTING AT TEST TIME

Tip: Your practical experience has value and can help you when taking a test.

Examples:

- Tank Volumes
- Chemical Dosing
- Process Control
- Equipment Troubleshooting
EXECUTING AT TEST TIME

Tip: Time management is essential to test taking success. One hundred eighty minutes may seem like a lot of time for 100+ questions, but use your time resources carefully.

Suggestions:

• Read the question or problem completely
• Don’t be stubborn
• Skip questions that completely baffle you
• Minimize second-guessing
• Make sure all questions are answered
• First pass, return to skipped questions, final review
EXECUTING AT TEST TIME

Tricks (The Weird and the Wonderful): If you are totally befuddled or just plain desperate, some very creative suggestions have been offered over the years. I endorse none of them.

• Statistically, B is the most common answer (is it?)
• Choose the longest answer (but not math)
• Use your watch (if you still have analog): Secondhand 12 to 3 answer is A, 3 to 6 answer is B,.....
• None of the Above, All of the Above???????
TURNING RECOMMENDATIONS INTO ACTIONS - THE MATH EXAMPLE
A 4' wide, 2' height box culvert is flowing full. The average velocity in the cross-section is 1.75 ft/sec. What is the discharge from the culvert, in gallons per minute?
**Question:** How many gallons per minute are in 14 cubic feet per second? (Assuming a tank with a circular cross-section)

1. **Area of the circular cross-section:**
   \[ A = \pi r^2 \]

2. **Length of the tank:**
   \[ \frac{\text{length}}{\text{height}} = \frac{4}{4} \]
   \[ 8 \times 1.75 = 14 \]

3. **Total volume in gallons per minute:**
   \[ \text{Volume} = 694 \text{ gpm} = 1.55 \text{ cf s} \]

4. **Conversion:**
   \[ \frac{14 \times 694}{1.55} = 6283.2 \text{ gpm} \]
per minute?

**GIVEN INFORMATION/KNOWN:**

- Culvert Width: 4 feet
- Culvert Height: 2 feet
- Velocity Through Culvert: 1.75 ft/sec

**SOLVING FOR:**

Discharge (\(\frac{\text{gallons}}{\text{minute}}\), gpm)  

**FORMULAS NEEDED:**

Flow Rate (cfs, \(\frac{\text{ft}^3}{\text{sec}}\)) = Area (ft²) \* Velocity (ft/sec)

**AREA (ft²)** = Rectangle (Box Culvert) = Length (ft) \* Width (ft)

Flow (gpm) = Flow (\(\frac{ft^3}{sec}\)) \* \(\frac{7.48 \text{ gallons}}{ft^3}\) \(\frac{1 \text{ minute}}{60 \text{ seconds}}\)

**AREA** = 2 ft \* 4 ft = 8 ft²

Flow (\(\frac{ft^3}{sec}\)) = 8 ft² \* 1.75 ft/sec = 14 \(\frac{ft^3}{sec}\)

Flow (\(\frac{\text{gallons}}{\text{minute}}\)) = 14 \(\frac{ft^3}{sec}\) \* \(\frac{7.48 \text{ gallon}}{ft^3}\) \(\frac{1 \text{ minute}}{60 \text{ seconds}}\) = 6283.2 gallons/minute
SOLVING MATH PROBLEMS IS JUST LIKE COOKING. GET A RECIPE, FOLLOW IT EXPLICITLY, AND YOU WILL HAVE SUCCESS
TAKEAWAYS

• Being Organized can Improve Your Success
• Having a Routine Process to Follow helps You Organize
• By Using and Following Your Process, You “Shake Off” the Jitters/Anxiety and Calmly Proceed with Solving the Problem
• Organization helps with Troubleshooting If You Happen to Make a Mistake
SUMMARY

Preparation is the most important element of this presentation. It addresses and hopefully reduces the psychological obstacles, so that, at test time, you can apply your knowledge without relying on a lot of tips and tricks.
2. Determine if the following integrals converge or diverge:

(a) \[ \int_{1}^{\infty} \frac{7 \cos^2(x)}{3 + x^2} \, dx \]

(b) \[ \int_{0}^{\pi/2} \frac{2}{x \sin(x)} \, dx \]

(c) \[ \int_{1}^{\infty} \frac{2}{\sqrt{4x^2 - 2}} \, dx \]