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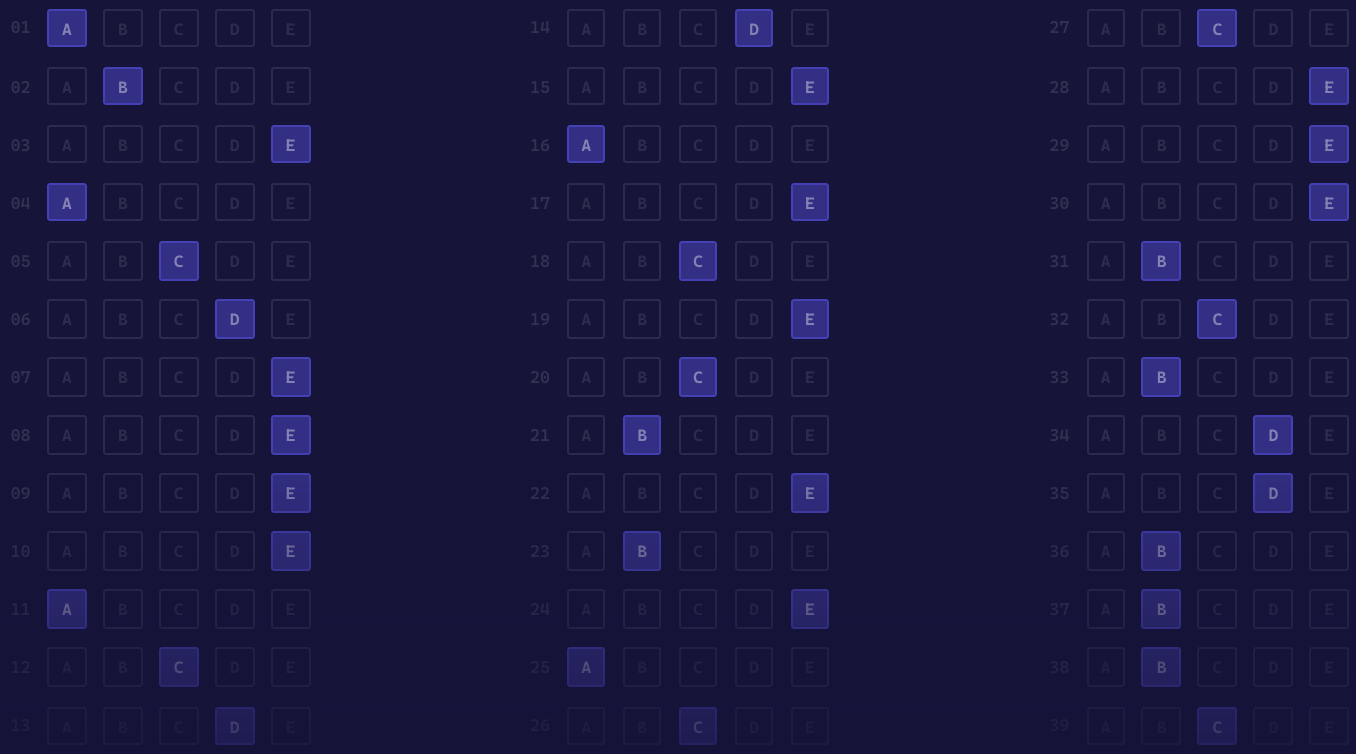

PRACTICE QUESTIONS

Connecticut Department of Public Health, Drinking Water Section

AAGYZXGC

WPI Water Treatment Operator Class III Exam

EDITION	QUESTIONS	FORMAT
Demo	9	Limited Edition PDF

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Before you begin

What this is

9 practice questions for Connecticut Department of Public Health, Drinking Water Section `AAGYZXGC`, each with its answer key and an explanation. Answer a question before you read its key — the explanation is worth more once you have committed.

If something looks wrong

Send us three things and we will check it:

- the exam code, `AAGYZXGC`
- the question number
- the email address on your order

Write to **support@mometrix.net**. We reply within one business day.

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QUESTION 1 SINGLE CHOICE

Which of the following is the primary purpose of adding a coagulant such as aluminum sulfate (alum) to raw water during treatment?

A To raise the pH of the water to prevent corrosion of distribution pipes

B To destabilize colloidal particles so they can aggregate into larger flocs

C To provide disinfection residual throughout the distribution system

D To soften the water by removing calcium and magnesium ions

ANSWER B

WHY Coagulants like alum are added to destabilize the electrical charges on colloidal particles, allowing them to collide and form larger, settleable flocs. Disinfection is handled by chlorine or other disinfectants, pH adjustment by chemicals such as lime or caustic soda, and softening by ion exchange or lime-soda ash processes.

QUESTION 2 SINGLE CHOICE

A treatment plant treats 2.0 million gallons per day (MGD). The chlorine dose required is 2.5 mg/L. How many pounds of chlorine per day must be applied? (1 gallon of water weighs 8.34 lb)

A 20.9 lb/day

B 33.4 lb/day

C 41.7 lb/day

D 52.2 lb/day

ANSWER C

WHY Pounds per day = (MGD) × (dose in mg/L) × 8.34 lb/gal. So, 2.0 × 2.5 × 8.34 = 41.7 lb/day. Option A omits the 8.34 factor; option B uses 2.0 mg/L; option D reverses the multiplication.

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QUESTION 3 SINGLE CHOICE

The federal Surface Water Treatment Rule requires that filtered water turbidity must be measured how often at a conventional surface water treatment plant?

A Once per shift using a grab sample

B Every 4 hours using a grab sample

C Continuously, with results recorded every 15 minutes

D Once daily, on a composite sample collected over 24 hours

ANSWER C

WHY Under the Surface Water Treatment Rule, systems using conventional filtration must continuously monitor the turbidity of the combined filter effluent and record the results at least every 15 minutes. Less frequent monitoring (grab sampling) is not permitted for compliance under the rule.

QUESTION 4 SINGLE CHOICE

Which filter operational parameter is most directly affected by an excessive filter influent flow rate that leads to turbidity breakthrough?

A Filter media effective size (ES)

B Backwash rate

C Filtration rate (filter loading rate)

D Underdrain orifice size

ANSWER C

WHY An excessive flow rate through a filter increases the filtration (loading) rate, which can shear previously captured floc from the media and force particles through, causing turbidity breakthrough. Effective size and underdrain orifice size are fixed design features, and backwash rate relates to cleaning the filter, not to influent flow.

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QUESTION 5 SINGLE CHOICE

A surface water treatment plant begins receiving raw water with a strong earthy/musty odor. Which compound is most likely responsible for this type of odor in source waters?

A Hydrogen sulfide

B Geosmin

C Manganese

D Total organic carbon (TOC)

ANSWER B

WHY Geosmin, along with 2-methylisoborneol (M2IB), is produced by certain cyanobacteria and actinomycetes and is the most common cause of earthy/musty taste and odor episodes in surface water. Hydrogen sulfide causes a rotten-egg odor, manganese causes metallic staining and taste issues, and TOC is a measure of organic content rather than an odor-causing compound itself.

QUESTION 6 SINGLE CHOICE

Which corrosion control treatment works by forming a protective, insoluble coating on the inside of metal distribution pipes?

A pH adjustment with sulfuric acid

B Addition of orthophosphate

C Increasing dissolved oxygen concentration

D Reducing alkalinity with carbon dioxide

ANSWER B

WHY Orthophosphate-based corrosion inhibitors react with metals (especially lead and copper) at the pipe wall to form a relatively insoluble, protective film that reduces metal release into the water. Lowering pH, increasing dissolved oxygen, or reducing alkalinity would typically increase corrosion rather than control it.

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QUESTION 7 SINGLE CHOICE

What does the CT value represent in surface water treatment disinfection calculations?

A **The chlorine residual concentration × the contact time in the disinfection basin**

B The total chlorine dose applied per million gallons

C The conductivity of the water multiplied by the temperature

D The cumulative time the filter has been in service since the last backwash

ANSWER **A**

WHY CT is the product of the disinfectant residual concentration (C, in mg/L) at a point in the basin and the contact time (T, in minutes) that water spends at that point. It is the key parameter used to verify that a disinfection process achieves the required inactivation of pathogens such as Giardia and viruses.

QUESTION 8 MULTIPLE CHOICE

Which of the following conditions can contribute to solids carryover from a conventional sedimentation basin into the filters? (Choose two.)

A Excessive hydraulic loading rate on the basin

B **Inadequate coagulant dosage for the raw water conditions**

C Low influent turbidity with stable temperature

D **Sludge accumulation in the basin that is not being removed regularly**

ANSWER **B** · **D**

WHY Both inadequate coagulant dose (resulting in poorly formed floc) and excessive sludge accumulation (which can re-suspend solids and shorten detention time) commonly cause solids to pass from the sedimentation basin into the filters. Excessive hydraulic loading also contributes, but the two best answers among the choices given are B and D. Low influent turbidity with stable temperature typically improves sedimentation performance.

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QUESTION 9 MULTIPLE CHOICE

Which of the following operational changes will most likely reduce the formation of total trihalomethanes (TTHM) in a surface water treatment plant? (Choose two.)

A **Removing as much natural organic matter as possible before chlorination**

B **Switching from free chlorine to chloramine for secondary disinfection**

C Increasing the free chlorine residual in the clearwell

D Raising the pH of the water prior to chlorination

ANSWER **A** · **B**

WHY TTHM formation depends on the amount of natural organic matter (NOM) present and the type/contact time of the disinfectant. Enhanced coagulation or other NOM removal before chlorination reduces TTHM precursors, and switching from free chlorine to chloramine substantially reduces TTHM formation because chloramine is a weaker oxidant. Increasing the free chlorine residual and lowering pH typically increase TTHM formation.

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