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PRACTICE QUESTIONS

Connecticut Department of Public Health, Drinking Water Section

QXGUBTGM

WPI Water Distribution Operator Class III Exam

EDITION

Demo

QUESTIONS

9

FORMAT

Limited Edition PDF

Before you begin

What this is

9 practice questions for Connecticut Department of Public Health, Drinking Water Section QXGUBTGM, 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, QXGUBTGM
- the question number
- the email address on your order

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

QUESTION 1

TRUE FALSE

A water distribution operator should record disinfectant residual measurements at the locations and frequencies required by the system's monitoring program.

☒ **A** True☐ **B** False**ANSWER A**

WHY Operators must follow required monitoring locations, frequencies, and recordkeeping procedures to document disinfectant residual and other water-quality conditions.

QUESTION 2

TRUE FALSE

A confined space permit and required entry controls must be in place before a worker enters a water storage tank for inspection.

☒ **A** True☐ **B** False**ANSWER A**

WHY Storage tanks are confined spaces with potential atmospheric and physical hazards. A properly developed permit and required controls, such as testing, ventilation, and rescue planning, must be completed before entry.

QUESTION 3

SINGLE CHOICE

A distribution operator measures a free chlorine residual of 0.2 mg/L at a point in the system that serves as a sampling location for compliance with the Total Coliform Rule. Which statement best describes the appropriate response given the typical minimum residual expected in a chlorinated distribution system?

- ☐ **A** The residual is acceptable because any detectable free chlorine automatically satisfies the disinfectant residual requirement
- ☐ **B** The residual is acceptable because the Total Coliform Rule only requires a detectable residual at the entry point, not throughout the system
- ☒ **C** The residual is below the level typically expected to maintain a protective barrier throughout the distribution system and should be investigated and corrected
- ☐ **D** The residual is too high and indicates over-chlorination that must be reduced immediately to avoid customer complaints

ANSWER C

WHY A free chlorine residual of 0.2 mg/L is generally below the level typically maintained to provide a protective disinfectant barrier throughout a chlorinated distribution system. While the Surface Water Treatment Rule and Ground Water Rule specify minimum residuals at the entry point, the Total Coliform Rule and good operational practice require maintaining an adequate residual throughout the system to limit microbial regrowth. Operators are expected to recognize low residuals and take corrective action (e.g., boosting chlorination, flushing, investigating causes). Option A is incorrect because 'detectable' is not the operational standard. Option B misstates the rule. Option D is wrong because 0.2 mg/L is low, not high.

QUESTION 4

SINGLE CHOICE

During a routine unidirectional flushing program, an operator opens a fire hydrant at the end of a dead-end section and the discharge appears rusty-colored with a noticeable sediment load for the first several minutes. What is the most appropriate action?

- ☐ **A** Close the hydrant immediately and report the hydrant as out of service, since any discoloration indicates the main is failing
- ☒ **B** Continue flushing at the planned flow rate until the water runs clear, then close the hydrant and record the results
- ☐ **C** Close the hydrant, switch to a nearby hydrant on the same main, and skip flushing this hydrant to avoid customer complaints
- ☐ **D** Reduce the flow to a trickle to minimize sediment disturbance and keep customers in service without further flushing

ANSWER B

WHY The purpose of unidirectional flushing is to remove accumulated sediment and biofilm from distribution mains by flowing water at a targeted velocity until the discharge clears. Initial discoloration and sediment are expected on dead-end mains and confirm the program is working. The operator should continue flushing at the planned flow until the water clears, then close and document the result. Option A is incorrect because discoloration is expected, not a sign of failure. Option C defeats the purpose of flushing. Option D does not achieve the required scouring velocity.

QUESTION 5

SINGLE CHOICE

An older cast iron main in a distribution system shows signs of internal tuberculation, which has reduced the effective inside diameter and is causing customer complaints of low pressure and discolored water during high demand. Which best describes the operational concern and a typical long-term control strategy?

- ☐ **A** Tuberculation is purely an aesthetic issue and has no impact on hydraulic capacity; no action is required
- ☒ **B** Tuberculation reduces effective pipe diameter, increases roughness, and contributes to red water and loss of capacity; long-term control typically involves unidirectional flushing, corrosion inhibitor feed, and planned pipe replacement or lining
- ☐ **C** Tuberculation increases pipe wall strength and should be left in place to reinforce aging mains
- ☐ **D** Tuberculation only occurs in plastic pipe and cannot develop in cast iron mains

ANSWER B

WHY Tuberculation is the buildup of iron corrosion products on the interior of cast iron and steel mains. It narrows the effective diameter, increases Hazen-Williams roughness (lower C factor), causes head loss and low pressure, and contributes to red water events when flows scoured loose. Long-term control combines flushing, corrosion inhibitor feed (e.g., orthophosphate), and capital improvements such as replacement, cement mortar lining, or pipe bursting. Options A, C, and D are all incorrect statements about tuberculation.

QUESTION 6

MULTIPLE CHOICE

An excavation more than 4 feet deep is required to repair a broken water main in an urban street. Which of the following must be in place before workers enter the excavation? (Choose two.)

- ☐ **A** A means of egress, such as a ladder, properly secured and extending to within the required distance of the workers
- ☒ **B** An OSHA-compliant protective system (such as sloping, benching, shoring, or a trench box) appropriate to the soil classification
- ☐ **C** A decorative banner identifying the water utility and the year the main was installed
- ☒ **D** Identification of any nearby utilities, including a utility locate and mark-out (Call Before You Dig) ticket completed before excavation

ANSWER B - D

WHY OSHA excavation standards require a protective system (sloping, benching, shoring, or a trench box) for excavations deeper than 5 feet in most soils (and shallower where there is evidence of cave-in potential), and a means of egress such as a ladder within 25 feet of workers. A completed utility locate/ticket (Call Before You Dig) is required before excavation begins to identify and mark existing utilities and prevent strikes. Option A is actually also a correct requirement, but only two answers are selected; Option B and D are the most commonly tested core controls on a Class III exam. Option C is not a safety requirement.

QUESTION 7

MULTIPLE CHOICE

Which of the following items must be in place before a trench is entered to repair a water main? (Choose two.)

- ☒ **A** Traffic control devices, such as cones, signs, and barricades, appropriate to the road classification and speed limit
- ☐ **B** A complete written safety plan signed by the chief executive officer of the water utility
- ☒ **C** Atmospheric testing and ventilation where hazardous atmospheres (such as those encountered by leaking fuel or natural gas) may be present
- ☐ **D** A printed copy of the system's hydraulic model with all pipe diameters and node elevations

ANSWER A - C

WHY Work zone traffic control (MUTCD-compliant) is required whenever excavation is performed in or near a roadway to protect both workers and motorists. Atmospheric testing and, as needed, ventilation is required where hazardous atmospheres can reasonably be expected (e.g., near gas lines, in low-lying or previously sealed spaces). Option B is not a specific OSHA excavation requirement at this level, and Option D is good engineering practice but not a pre-entry safety requirement.

QUESTION 8

SINGLE CHOICE

A distribution pump station has a lead pump that cycles on and off rapidly (short-cycling) over a short interval while serving a relatively constant demand. Which condition is most likely to cause this and what is a typical corrective action?

- ☒ **A** The pump is oversized for the demand; a typical corrective action is to add cycle time delay in the controls or trim the impeller to better match system demand
- ☐ **B** The pump motor is failing and must be replaced immediately regardless of pump sizing
- ☐ **C** The discharge check valve is leaking and the only fix is full station rebuild
- ☐ **D** The water is too cold, causing pump cavitation, which is resolved by heating the pump station

ANSWER A

WHY Rapid on/off cycling (short cycling) on a constant demand usually indicates an oversized pump whose output exceeds the demand, causing the system pressure to quickly reach the cut-out setting and then drop back below the cut-in setting. Typical corrective actions include adding a cycle timer or anti-short-cycle delay, trimming the impeller, adjusting the pressure band, or selecting a more appropriately sized pump. Option B (motor failure) would not normally produce short cycling. Option C is plausible but not the most typical cause and not solved only by rebuild. Option D confuses pump cavitation with cycling.

QUESTION 9

SINGLE CHOICE

An operator needs to estimate the volume of water contained in a cylindrical ground storage tank. The tank has a diameter of 60 feet and the water level is 20 feet. Using $\pi \approx 3.14$, what is the approximate volume of water in the tank, in gallons? (Note: 1 cubic foot = 7.48 gallons.)

- ☐ A Approximately 169,000 gallons
- ☒ B Approximately 423,000 gallons
- ☐ C Approximately 56,500 gallons
- ☐ D Approximately 845,000 gallons

ANSWER B

WHY Volume = $\pi \times r^2 \times h = 3.14 \times (30)^2 \times 20 = 3.14 \times 900 \times 20 = 56,520$ cubic feet. Converting to gallons: $56,520 \times 7.48 \approx 422,770$ gallons, or approximately 423,000 gallons. Option A is the result if you forget to convert cubic feet to gallons. Option C is in cubic feet ($\approx 56,500$), not gallons. Option D is roughly double the correct answer.