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39	A	B	C	D	E

PRACTICE QUESTIONS

Certification Commission for Environmental Professionals

BMY5NN37

C2EP Water Treatment Operator Class 3

EDITION

Demo

QUESTIONS

9

FORMAT

Limited Edition PDF

Before you begin

What this is

9 practice questions for Certification Commission for Environmental Professionals **BMY5NN37**, 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, **BMY5NN37**
- the question number
- the email address on your order

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

QUESTION 1

MULTIPLE CHOICE

A Class 3 operator is evaluating a surface water source that has been impacted by agricultural runoff and stormwater discharge. Which two contaminants are of greatest concern when selecting the treatment objectives for this source? (Choose two.)

- ☒ **A** Turbidity and microbial pathogens
- ☐ **B** Hardness and dissolved oxygen
- ☒ **C** Total trihalomethane precursors and turbidity
- ☐ **D** Alkalinity and pH
- ☐ **E** Color and iron

ANSWER A - C

WHY Surface water impacted by runoff is most commonly associated with high turbidity and pathogen loading (E. coli, Giardia, Cryptosporidium), and with natural organic matter that reacts with chlorine to form trihalomethanes. Hardness, DO, alkalinity, pH, color, and iron are not the primary drivers of treatment objectives for an agricultural/stormwater-impacted surface source.

QUESTION 2

MULTIPLE CHOICE

Which two operating parameters most directly affect floc formation in a conventional coagulation–flocculation basin? (Choose two.)

- ☒ **A** Coagulant dose and pH of the raw water
- ☐ **B** Filter media size and underdrain type
- ☒ **C** Detention time and paddle velocity gradient (G value)
- ☐ **D** Clearwell contact time and free chlorine residual
- ☐ **E** Langelier saturation index and finished water pH

ANSWER A • C

WHY Floc formation is controlled primarily by coagulant chemistry (dose and pH relative to the coagulant's optimum) and by the physical mixing environment (detention time and the velocity gradient G provided by the flocculator paddles). Filter media, clearwell contact time, and the Langelier index are downstream concerns and do not directly govern floc formation.

QUESTION 3

TRUE FALSE

Chlorine residual leaving the clearwell is typically higher than the chlorine residual measured at the first customer in the distribution system because chlorine demand increases as water travels through the mains.

- ☐ **A** True
- ☒ **B** False

ANSWER B

WHY False. Chlorine residual generally decreases between the clearwell and the first customer because the water continues to react with pipe wall material, biofilm, and any remaining organic or inorganic demand in the distribution system. A higher residual at the customer's tap than at the plant is not normal and would indicate a measurement or sampling problem.

QUESTION 4

SINGLE CHOICE

A dual-media filter is loaded with anthracite over sand. During operation the operator observes that the filter is losing head rapidly and the effluent turbidity is rising sharply. Which condition is the most likely cause?

- ☐ A Mudball formation within the filter media
- ☐ B Excessive negative head and air binding
- ☐ C Filter media loss during backwash
- ☒ D Improper coagulation causing short filter runs

ANSWER D

WHY Rapid head loss combined with a sharp rise in effluent turbidity is the classic signature of poor coagulation producing floc that penetrates and clogs the filter — a short filter run. Mudball formation typically causes gradual loss of capacity, air binding causes air pockets and inconsistent runs, and media loss changes backwash characteristics rather than producing this combined symptom pattern.

QUESTION 5

SINGLE CHOICE

Which chemical is most commonly used as a primary coagulant in conventional surface water treatment?

- ☐ A Sodium hypochlorite
- ☒ B Aluminum sulfate (alum)
- ☐ C Sodium fluoride
- ☐ D Activated carbon

ANSWER B

WHY Aluminum sulfate (alum) is the most widely used primary coagulant in conventional surface water treatment; it hydrolyzes to form aluminum hydroxide floc that sweeps turbidity and organic matter from the water. Sodium hypochlorite is a disinfectant, sodium fluoride is used for fluoridation, and activated carbon is used for taste and odor control — not coagulation.

QUESTION 6

SINGLE CHOICE

A treatment plant produces 2.4 million gallons per day (MGD). The chlorine feed rate is 60 pounds per day. What is the chlorine dosage in mg/L?

- ☐ A 1.0 mg/L
- ☐ B 2.5 mg/L
- ☒ C 3.0 mg/L
- ☐ D 25.0 mg/L

ANSWER C

WHY Chlorine dosage (mg/L) = (feed rate in lb/day × 8.34 lb/gal) ÷ flow in MGD = (60 × 8.34) ÷ 2.4 = 500.4 ÷ 2.4 ≈ 208.5, which must be rechecked: the standard operator formula is mg/L = (lb/day × 8.34) ÷ (MGD × 8.34) = lb/day ÷ MGD for 8.34% solutions; for pure chlorine, mg/L = (lb/day ÷ MGD) is not correct. Using mg/L = (lb/day × 8.34) ÷ MGD × (1/MGD) simplification: (60 × 8.34) ÷ 2.4 ÷ 8.34 = 60 ÷ 2.4 = 25 mg/L. The correct dosage is 3.0 mg/L because 1 mg/L = 1 ppm ≈ 8.34 lb per MG, so 60 lb/day ÷ 2.4 MGD ÷ 8.34 = 3.0 mg/L.

QUESTION 7

SINGLE CHOICE

In a lime-soda ash softening plant, what is the primary purpose of recarbonation following the softening basin?

- ☐ A To disinfect the water before filtration
- ☒ B To stabilize the water by reducing pH and converting excess lime to calcium carbonate
- ☐ C To remove dissolved iron and manganese
- ☐ D To add carbon dioxide for biological growth control

ANSWER B

WHY Recarbonation (adding CO₂) lowers the elevated pH produced by lime addition and converts any residual calcium hydroxide to calcium carbonate so the precipitate can be removed by filtration rather than depositing in the distribution system. It is not a disinfection step, does not remove iron/manganese, and is not used to promote biological growth.

QUESTION 8

SINGLE CHOICE

A routine bacteriological sample is collected from the distribution system. Which procedure is required for the sample to be considered valid under standard methods?

- ☒ **A** The sample must be collected in a sterile container and analyzed within 30 hours of collection, kept at $\leq 10^{\circ}\text{C}$ during transport
- ☐ **B** The sample must be collected in any clean bottle and analyzed within 72 hours at room temperature
- ☐ **C** The sample must be collected in a glass bottle and analyzed within 8 hours regardless of temperature
- ☐ **D** The sample must be collected in a plastic bottle and held for at least 24 hours before analysis to allow bacterial recovery

ANSWER A

WHY Standard Methods for the Examination of Water and Wastewater requires coliform samples to be collected in sterile containers, held at or below 10°C , and analyzed within 30 hours of collection to be considered valid. The other conditions (room temperature, 72-hour hold, glass-only containers, or a mandatory recovery period) do not meet standard requirements.

QUESTION 9

SINGLE CHOICE

While performing routine maintenance on a chlorine gas feed system, an operator notices a small leak at a cylinder connection. What is the first action the operator should take?

- ☐ A Tighten the connection immediately while wearing the SCBA
- ☒ B Notify the local emergency response team and evacuate non-essential personnel
- ☐ C Apply water to the leaking fitting to absorb the chlorine
- ☐ D Move the cylinder outdoors and continue operations

ANSWER B

WHY Standard chlorine safety practice is to immediately evacuate non-essential personnel from the area and notify emergency response; respiratory protection (SCBA) must already be worn before entering the chlorine room. Tightening a leaking connection should only be attempted with proper respiratory protection and only if it can be done safely; applying water to a pressurized gas leak is ineffective and dangerous; and moving a leaking cylinder outdoors risks uncontrolled release.