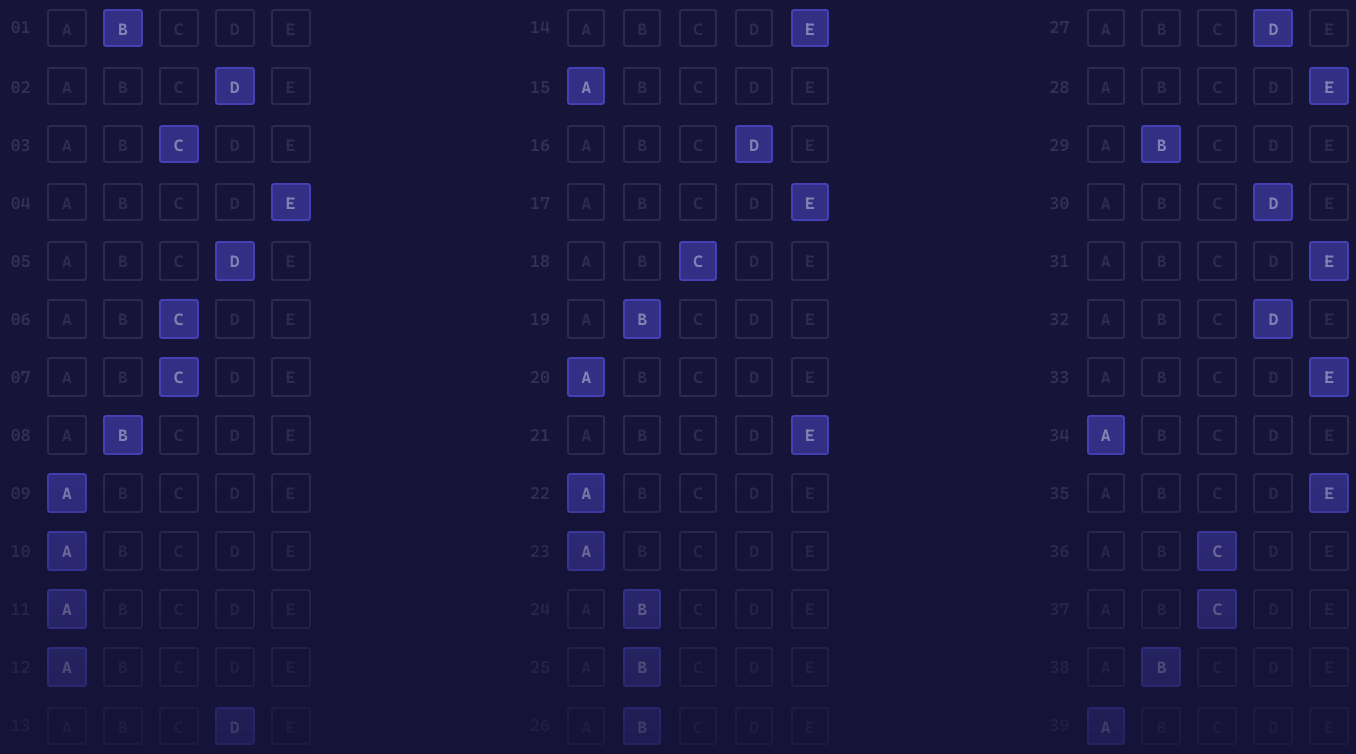
MOMETRIX
SMARTER PREP. BETTER RESULTS.



PRACTICE QUESTIONS

California - Nevada Section American Water Works Association

FMB96LHT

CA-NV AWWA Advanced Water Treatment Operator Grade 4

EDITION	QUESTIONS	FORMAT
Demo	9	Limited Edition PDF

WEB www.mometrix.net

SUPPORT support@mometrix.net

Before you begin

What this is

9 practice questions for California - Nevada Section American Water Works Association `FMB96LHT`, 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, `FMB96LHT`
- the question number
- the email address on your order

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

QUESTION 1 SINGLE CHOICE

In reverse osmosis (RO) membrane treatment, what primarily determines the rejection of dissolved ions such as sodium and chloride?

A The applied feed water pressure alone

B The pore size of the membrane support layer

C **The solution-diffusion mechanism governed by membrane material properties and operating pressure**

D The color and turbidity of the feed water

ANSWER C

WHY RO membranes are considered non-porous, and ion rejection is governed primarily by the solution-diffusion mechanism, where the membrane material's physicochemical properties (in conjunction with the pressure driving force) control the relative permeation of water versus dissolved species. Feed pressure drives flux, but selectivity (rejection) is a function of membrane and solute characteristics.

QUESTION 2 SINGLE CHOICE

A water treatment plant switches from free chlorine to chloramine for final disinfection. Compared with free chlorine at equivalent disinfectant residual, chloramines are generally characterized by:

A Stronger oxidizing power and faster microbial inactivation kinetics

B Greater formation potential for trihalomethanes (THMs) and haloacetic acids (HAAs)

C **Weaker oxidizing power but more persistent residuals in the distribution system**

D Inability to provide a measurable residual under any distribution system conditions

ANSWER C

WHY Chloramines (particularly monochloramine) are weaker oxidizing disinfectants than free chlorine and have slower inactivation kinetics, but they are far more persistent, which helps maintain a residual throughout the distribution system. Their primary advantage is significantly reduced formation of regulated DBPs such as THMs and HAAs because of weaker oxidation of natural organic matter.

QUESTION 3 SINGLE CHOICE

When performing a jar test to optimize coagulation for a source water with high alkalinity and moderate turbidity, the operator observes that increasing the coagulant dose beyond the optimum results in charge reversal on the particles. The most appropriate operational response is to:

A Continue increasing the coagulant dose until turbidity rises sharply

B **Reduce the dose back to the level that produced the lowest residual turbidity and best floc formation**

C Switch immediately to an anionic polymer only

D Add lime to suppress all coagulation

ANSWER **B**

WHY Charge reversal occurs when overdosing a cationic coagulant (such as alum or a cationic polymer), restabilizing colloidal particles. The jar test identifies the optimum dose as the one yielding lowest residual turbidity and best settleable floc; continuing past this point worsens performance. Returning to that optimum dose and possibly adding a polymer aid is the correct response.

QUESTION 4 SINGLE CHOICE

During a filter backwash of a conventional dual-media (anthracite over sand) filter, the operator notices that the backwash water is carrying a large amount of anthracite media to the washwater trough. The most likely cause is:

A The filter media is properly graded and the backwash flow rate is too low

B The backwash flow rate is too high or the media is being fluidized beyond the required expansion, causing media loss

C The underdrain is plugged, increasing upward flow

D The influent turbidity is too low

ANSWER B

WHY Excess backwash flow rate causes excessive bed expansion, allowing lighter anthracite particles to be carried over the washwater trough. Backwash rates must be calibrated to achieve adequate fluidization and cleaning (typically 25–50% bed expansion) without media loss. The corrective action is to reduce backwash flow rate and inspect trough placement.

QUESTION 5 SINGLE CHOICE

A treatment plant is using granular activated carbon (GAC) contactors to remove a taste-and-odor compound (e.g., MIB or geosmin) following ozonation. Which operational parameter most directly indicates when GAC media should be reactivated or replaced?

A The color of the GAC particles

B The bed pressure drop alone

C Breakthrough of the target contaminant above the treatment goal in the GAC effluent

D The dissolved oxygen concentration in the influent

ANSWER C

WHY The service life of GAC for a given contaminant ends when the adsorptive capacity is exhausted, indicated by breakthrough (rising effluent concentration) of the target compound above its treatment goal. Pressure drop and media color may indicate other problems (channeling, fouling) but do not define adsorptive exhaustion.

QUESTION 6 SINGLE CHOICE

An advanced treatment facility drawing from a surface water source experiences a sudden increase in influent total organic carbon (TOC) following a storm event. The expected operational consequence in the ozone contactor is:

A **Increased ozone demand and reduced ozone residual at a given ozone dose**

B Decreased ozone demand because of dilution

C No change in ozone transfer efficiency

D Complete elimination of bromate formation risk

ANSWER **A**

WHY Higher TOC means more oxidizable organic matter, which consumes ozone (increased ozone demand) and reduces the CT and ozone residual achievable at a fixed ozone dose. Higher TOC also generally increases bromate formation potential because of reactions with bromide and NOM, so the risk is not eliminated—it may increase under some conditions.

QUESTION 7 SINGLE CHOICE

Ion exchange softening using a strong-acid cation resin in the sodium form exchanges which of the following ions for sodium as the resin becomes exhausted?

A Chloride and sulfate

B Bicarbonate

C **Calcium and magnesium (hardness cations)**

D Sodium and potassium

ANSWER **C**

WHY Strong-acid cation (SAC) resin in the sodium cycle preferentially exchanges hardness cations (Ca^{2+} and Mg^{2+}) for sodium (Na^{+}) on the resin sites. As the resin exhausts, hardness leakage rises. Anions such as chloride, sulfate, and bicarbonate pass through and are not exchanged by a SAC resin.

QUESTION 8 SINGLE CHOICE

An online chlorine residual analyzer on the treated water line is reading significantly lower than the laboratory DPD method on the same sample. Which is the most likely cause?

A The DPD reagent has degraded

B The online analyzer's flow cell is fouled, the membrane/electrode is worn, or the reagent/buffer is depleted

C The sample line is too short

D The plant finished water has no chlorine demand

ANSWER B

WHY Differences between online analyzers and lab DPD are most often due to analyzer-side issues: fouled flow cell, depleted reagents/electrolyte, worn membrane, or improper calibration. The lab DPD is typically considered the reference for verification until the analyzer is cleaned, recalibrated, and confirmed against lab results.

QUESTION 9 SINGLE CHOICE

An advanced water treatment plant is evaluating ozone as a primary disinfectant ahead of a chloramine residual. Which characteristic of ozone MOST directly limits its ability to maintain a disinfectant residual throughout the distribution system?

A Ozone decomposes rapidly in water and does not produce a lasting residual

B Ozone reacts only with bromide to form bromate

C Ozone is ineffective against viruses at typical doses

D Ozone requires dissolved oxygen concentrations above 15 mg/L

ANSWER A

WHY Ozone is an extremely strong oxidant with a half-life of only minutes in water, so it dissipates quickly and leaves essentially no residual. This is why utilities that use ozone for primary disinfection typically follow it with a secondary disinfectant (such as chloramine or free chlorine) to maintain a residual in the distribution system.