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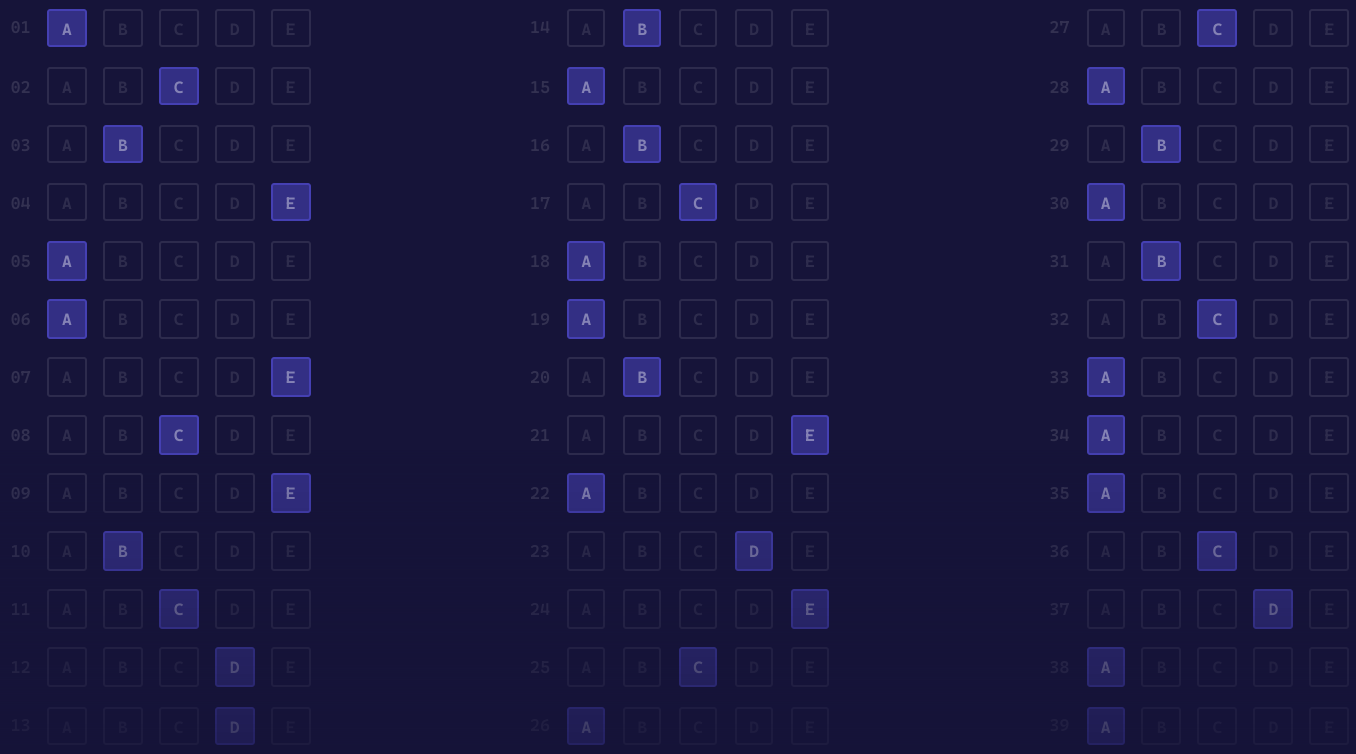

PRACTICE QUESTIONS

ABC-SD: South Dakota Department of Agriculture and Natural Resources

RZH7TKAZ

South Dakota Water Distribution Class 2

EDITION	QUESTIONS	FORMAT
Demo	9	Limited Edition PDF

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Before you begin

What this is

9 practice questions for ABC-SD: South Dakota Department of Agriculture and Natural Resources `RZH7TKAZ`, 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, `RZH7TKAZ`
- 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 MULTIPLE CHOICE

Which of the following are common sources of supply for a South Dakota public water distribution system? (Choose two.)

A **Groundwater from wells tapping the Madison (Pahasapa) Limestone aquifer**

B Surface water pumped directly from an unfiltered irrigation return canal

C **Treated finished water purchased from a neighboring public water system**

D Rainwater harvested exclusively from a single rooftop downspout with no supplemental supply

E Surface water withdrawn from a regulated river or reservoir intake

ANSWER **A · C**

WHY South Dakota public water systems commonly use groundwater, including the deep Madison (Pahasapa) Limestone aquifer, and many systems purchase finished water from a wholesale/connecting system. Surface water intakes must be from approved, regulated sources such as rivers or reservoirs with proper treatment; raw, unfiltered irrigation return canals are not an approved source. A single rooftop downspout cannot serve as a source for a public water system. Options E is plausible but only one of the two correct answers is requested, and A and C together represent the most widely documented source types used in the state.

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QUESTION 2 MULTIPLE CHOICE

A distribution operator is performing routine system maintenance. Which of the following tasks are typically part of a valve and hydrant maintenance program? (Choose two.)

- **A** **Operating each mainline valve fully closed and fully open on a scheduled cycle to prevent seizing**
- B Painting hydrant barrels bright yellow regardless of the approved color-coding standard
- **C** **Inspecting hydrants for proper drainage after flow testing and lubricating threads as needed**
- D Replacing the turbine in every customer service meter annually as preventive maintenance
- E Removing all mainline valves from the GIS records to simplify mapping

ANSWER **A · C**

WHY Standard distribution maintenance programs include cycling mainline valves (exercising) on a routine schedule to keep them operable, and inspecting/lubricating hydrants so they drain properly and threads are serviceable. Painting all hydrants one color ignores NFPA-style color-coding for flow capacity. Customer service meters are replaced based on age, accuracy testing, or failure, not on a blanket annual schedule. Removing valves from GIS records is the opposite of good recordkeeping.

QUESTION 3 SINGLE CHOICE

What is the primary purpose of elevated storage in a water distribution system?

- A To filter suspended solids from finished water before it reaches customers
- B To provide disinfectant contact time equivalent to a clearwell
- **C** **To maintain system pressure and supply during peak demand and provide emergency reserve**
- D To remove iron and manganese through oxidation in the tank

ANSWER **C**

WHY Elevated storage uses gravity to maintain distribution system pressure, meet peak hourly demands, equalize pumping cycles, and provide a reserve for fire flow and emergencies. It is not a treatment process — filtration, disinfection contact time, and iron/manganese removal are performed at the treatment plant, not in the distribution storage tank.

QUESTION 4 SINGLE CHOICE

A distribution operator increases the flow rate through a uniform-diameter main. Assuming all other factors remain constant, what happens to the head loss due to friction in the main?

A It decreases linearly with flow

B It remains essentially unchanged because pipe diameter is unchanged

C **It increases at a rate greater than the increase in flow (approximately with the square of velocity)**

D It decreases because higher velocity reduces turbulence

ANSWER C

WHY In pressurized water mains, friction head loss is approximately proportional to the square of the velocity (and thus roughly the square of the flow rate) for fully turbulent flow, as expressed in the Hazen-Williams and Darcy-Weisbach equations. Therefore, doubling the flow can cause friction loss to increase by roughly four times, not decrease.

QUESTION 5 SINGLE CHOICE

A groundwater supply contains elevated iron and manganese. Which treatment process is most commonly used to remove both before the water enters the distribution system?

A Reverse osmosis followed by blending

B Ion exchange softening using sodium-form resin

C **Oxidation (typically with chlorine, potassium permanganate, or aeration) followed by filtration**

D Ultraviolet disinfection only

ANSWER C

WHY Iron and manganese are most commonly removed by oxidizing the soluble forms to insoluble forms (using chlorine, potassium permanganate, or aeration) and then filtering the precipitated particles. Ion exchange softens water but does not effectively remove iron and manganese without pretreatment. UV disinfection has no effect on iron and manganese, and reverse osmosis is not the standard process for these contaminants in groundwater systems.

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QUESTION 6 SINGLE CHOICE

Before a new or repaired water main can be placed into service, what must typically be done?

A The main must be flushed only until the discharge runs clear

B The main must be disinfected, flushed, and sampled for bacteriological analysis with results acceptable to the reviewing authority

C The main can be placed in service immediately if the contractor pressure-tests it to 150 psi

D The main must be filled with a 1,000 mg/L chlorine solution and left sealed with no flushing or sampling required

ANSWER B

WHY Standard practice (and South Dakota DANR requirements consistent with AWWA C651) requires that new, cleaned, or repaired mains be disinfected, then flushed to remove the highly chlorinated water, and then sampled for bacteriological quality. Samples must be negative (or otherwise acceptable) before the main is placed into service. Pressure testing alone, visual clearing, or simply filling and sealing the main are not acceptable.

QUESTION 7 SINGLE CHOICE

Why is it important to maintain a measurable disinfectant residual throughout the distribution system?

A It increases the pH of the water and prevents corrosion of lead service lines

B It provides a barrier against microbial regrowth and helps protect water quality between the treatment plant and the customer

C It eliminates the need for any cross-connection control program

D It softens the water and removes hardness

ANSWER B

WHY A detectable disinfectant residual (such as free chlorine or chloramine) throughout the distribution system acts as a secondary barrier against microbial contamination and helps control biofilm and regrowth. It does not raise pH, does not replace cross-connection control, and does not soften water.

QUESTION 8 SINGLE CHOICE

Which condition in a distribution system most directly contributes to internal corrosion of iron water mains?

A Maintaining a slightly alkaline pH and a stable calcium carbonate saturation index

B Use of a cement-mortar lining on the interior of the pipe

C **Low pH, low alkalinity, and high dissolved oxygen in the finished water**

D Installing ductile-iron pipe with a polyethylene encasement in corrosive soils

ANSWER C

WHY Internal corrosion of iron pipe is accelerated by water that is aggressive toward iron — low pH, low alkalinity (low buffering capacity), and the presence of dissolved oxygen, along with high chloride or sulfate levels. Slightly alkaline pH with a positive calcium carbonate saturation index, cement-mortar linings, and polyethylene encasement all reduce corrosion rather than contribute to it.

QUESTION 9 SINGLE CHOICE

Which device is used to protect a potable water supply from backflow caused by a non-potable connection downstream of the meter?

A A pressure-reducing valve

B An air-release valve at a high point in the main

C **An approved backflow preventer (such as a reduced pressure zone or double check valve assembly)**

D A altitude valve on the elevated storage tank

ANSWER C

WHY Backflow prevention devices — such as reduced pressure zone (RPZ) assemblies and double check valve assemblies — are installed to protect the potable supply from contamination due to backpressure or backsiphonage from a non-potable connection. Pressure-reducing valves control pressure, air-release valves remove air, and altitude valves control tank filling — none of these provide backflow protection.

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