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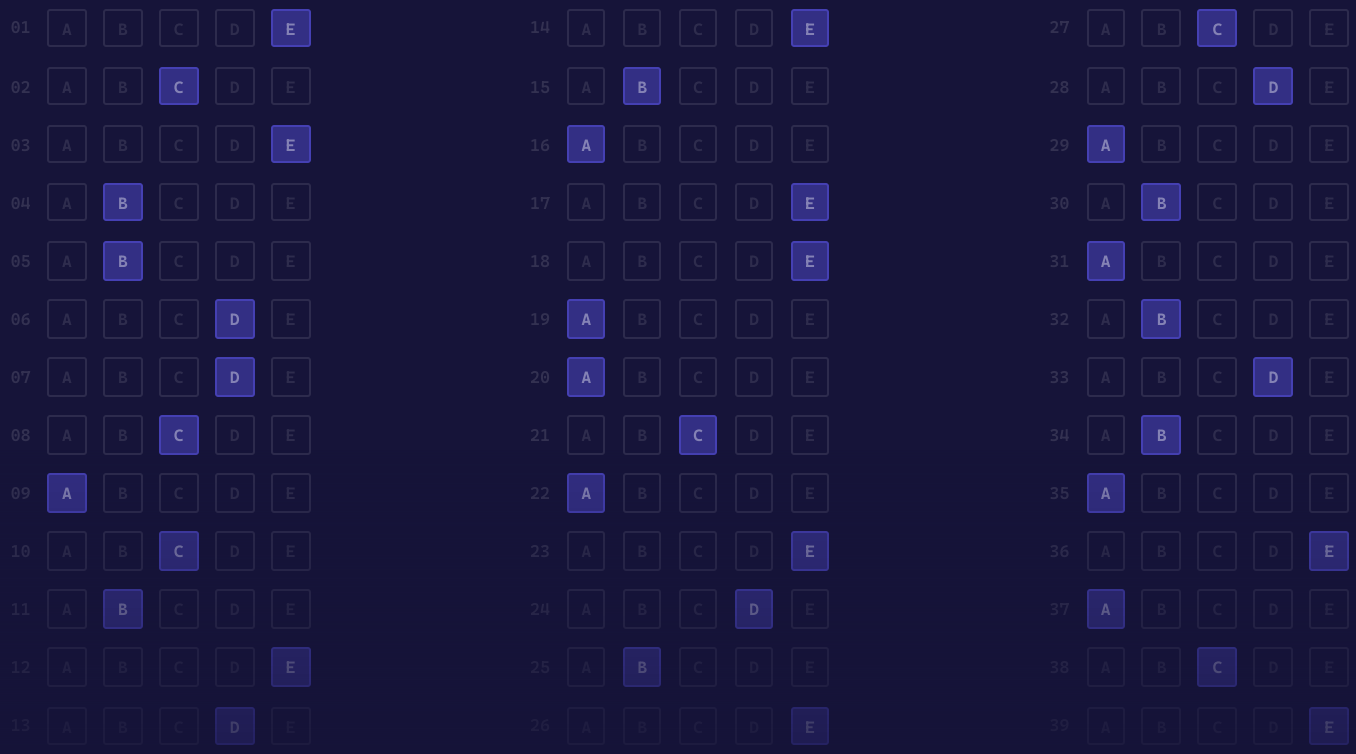

PRACTICE QUESTIONS

Colorado Certified Water Professionals

LA9QHJU6

Colorado Wastewater Treatment Operator Class S

EDITION	QUESTIONS	FORMAT
Demo	9	Limited Edition PDF

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Before you begin

What this is

9 practice questions for Colorado Certified Water Professionals `LA9QHJU6`, 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, `LA9QHJU6`
- 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

An operator notices that the mixed liquor suspended solids (MLSS) in the aeration basin has risen to 4,800 mg/L while the influent BOD loading has remained constant. Which operational adjustment is most appropriate as a first step to bring MLSS back to the target range?

A **Increase the return activated sludge (RAS) flow rate to waste more solids from the clarifier**

B Reduce the dissolved oxygen concentration in the aeration basin

C Increase the hydraulic retention time of the aeration basin

D Decrease the chlorine dose applied to the disinfection stage

ANSWER **A**

WHY MLSS has accumulated beyond the target, indicating excess solids inventory. Wasting activated sludge (either directly from the aeration basin or by increasing the RAS wasting rate) is the standard operational response to lower MLSS. Reducing DO would worsen settling and is not a wasting strategy; retention time and chlorination do not control MLSS directly.

QUESTION 2 SINGLE CHOICE

A wastewater treatment plant uses chlorine gas for disinfection. The required contact-time (CT) value for the chlorination stage is 1.5 mg/L·min at peak flow. The chlorine residual leaving the contact chamber is measured at 0.5 mg/L. What is the minimum acceptable contact time under these conditions?

A 1 minute

B 2 minutes

C **3 minutes**

D 5 minutes

ANSWER **C**

WHY CT (mg/L·min) is the product of residual chlorine concentration and contact time. Required CT ÷ measured residual = 1.5 ÷ 0.5 = 3 minutes minimum contact time.

QUESTION 3 SINGLE CHOICE

Under a typical NPDES permit, the 30-day average effluent limit for biochemical oxygen demand (BOD_5) applies to what type of sample?

A A single grab sample collected any time during the month

B A composite sample collected over a 24-hour period and averaged across all valid monitoring events in the month

C The maximum value observed in any single grab sample during the month

D A composite sample collected only during the highest-flow hour of the day

ANSWER B

WHY The 30-day average limit is calculated from the arithmetic mean of multiple valid composite samples collected at equal time intervals across the reporting month. Grab samples are used for instantaneous limits (e.g., minimum or maximum values), not for monthly averages.

QUESTION 4 SINGLE CHOICE

What is the primary purpose of a bar screen at the headworks of a wastewater treatment plant?

A To remove dissolved organic matter from the incoming wastewater

B To reduce the biochemical oxygen demand (BOD) of the influent by biological activity

C To remove large debris and rags to protect downstream pumps and equipment

D To provide chlorine contact time for pathogen reduction

ANSWER C

WHY Bar screens are a preliminary treatment step whose purpose is to physically remove large objects (rags, sticks, plastics, debris) that could damage or clog downstream equipment, especially pumps. They do not remove dissolved constituents or disinfect.

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QUESTION 5 SINGLE CHOICE

Which operational parameter is most directly increased by operating an anaerobic digester at a higher temperature within the mesophilic range?

A The volatile acids-to-alkalinity ratio in the digester

B The rate of volatile solids destruction and gas generation

C The amount of grit that settles at the bottom of the digester

D The level of dissolved oxygen in the digester contents

ANSWER B

WHY Within the mesophilic range (about 95–105 °F / 35–40 °C), higher operating temperatures accelerate the metabolic activity of methanogenic bacteria, which directly increases the rate of volatile solids destruction and biogas (methane) production. Anaerobic digesters are sealed and contain no dissolved oxygen.

QUESTION 6 SINGLE CHOICE

A secondary clarifier is exhibiting rising sludge (blanket rising to the surface). Which condition is most likely contributing to this problem?

A Excessively high dissolved oxygen in the aeration basin

B Denitrification in the sludge blanket producing nitrogen gas that floats the solids

C Insufficient grit accumulation in the primary clarifier

D Excessively high free chlorine residual in the RAS line

ANSWER B

WHY Rising sludge in secondary clarifiers is classically caused by denitrification: nitrates in the clarifier sludge blanket are reduced to nitrogen gas (N_2) under anoxic conditions, and the gas bubbles attach to floc particles and float them to the surface. Higher DO, less grit, or chlorination do not float sludge in this manner.

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QUESTION 7 SINGLE CHOICE

A BOD_5 test requires a standard sample bottle of 300 mL. According to Standard Methods, what is the minimum recommended volume of seed (seeded dilution water or seed material) that must be added to the bottle for a valid seeded sample?

A 0.5 mL

B 5 mL

C 25 mL

D 100 mL

ANSWER C

WHY Standard Methods generally specifies a minimum of about 25 mL of seed per 300 mL BOD bottle for a valid seeded dilution, so that sufficient viable microorganisms are present to exert a measurable oxygen demand in blanks and seeded controls.

QUESTION 8 SINGLE CHOICE

What does the Food-to-Microorganism (F/M) ratio measure in an activated sludge system?

A The ratio of effluent BOD to mixed liquor suspended solids

B The ratio of influent BOD loading to the mass of mixed liquor volatile suspended solids (MLVSS) under aeration

C The ratio of return activated sludge (RAS) flow to the aeration basin volume

D The ratio of wasted sludge to the dissolved oxygen concentration

ANSWER B

WHY The F/M ratio is defined as the mass of BOD applied per day divided by the mass of MLVSS (or equivalent active biomass) under aeration. It is a key process control indicator, not a flow ratio or a DO ratio.

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QUESTION 9 MULTIPLE CHOICE

Which of the following operating parameters typically must be considered when evaluating activated sludge process performance? (Choose three.)

A **Dissolved oxygen concentration in the aeration basin**

B **Mixed liquor suspended solids (MLSS) concentration**

C Effluent chlorine residual after disinfection

D **Food-to-Microorganism (F/M) ratio**

E Return activated sludge (RAS) flow rate

ANSWER **A** · **B** · **D**

WHY The three classic activated sludge process control parameters are dissolved oxygen in the aeration basin, MLSS concentration, and the F/M ratio (or equivalent SRT/MCRT). Effluent chlorine residual is a disinfection parameter, not an activated sludge control parameter, and while RAS flow is an operational tool, it is generally considered a control variable rather than one of the three primary performance indicators.

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