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| 36 | A | B | C | D | E |
| 37 | A | B | C | D | E |
| 38 | A | B | C | D | E |
| 39 | A | B | C | D | E |

PRACTICE QUESTIONS

Colorado Certified Water Professionals

**AAGYZ5R9**

Colorado Industrial Wastewater Treatment Operator Class A

EDITION

Demo

QUESTIONS

9

FORMAT

Limited Edition PDF

# Before you begin

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## What this is

9 practice questions for Colorado Certified Water Professionals **AAGYZ5R9**, 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, **AAGYZ5R9**
- 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 the activated sludge process, the ratio of food (influent substrate) to microorganisms (mixed liquor volatile suspended solids), measured as F/M, is a primary control parameter. A Class A operator observes that the F/M ratio in an aeration basin has dropped well below the normal operating range while dissolved oxygen remains above 2.0 mg/L and the mixed liquor suspended solids (MLSS) have increased. Which operational adjustment is most appropriate?

- ☒ **A** Increase the waste activated sludge (WAS) rate to reduce MLSS and bring the F/M ratio back into range
- ☐ **B** Decrease the return activated sludge (RAS) rate to allow solids to build up in the clarifier
- ☐ **C** Reduce aeration to lower dissolved oxygen and prevent pin floc formation
- ☐ **D** Increase the influent substrate loading by adding a carbon source to the aeration basin

**ANSWER A**

**WHY** A low F/M ratio with rising MLSS indicates too much biomass relative to available food. The standard corrective action is to waste more activated sludge (increase WAS) to lower MLSS and restore the F/M ratio to its target range. Decreasing RAS would worsen solids inventory, reducing aeration does not address the mass balance, and adding carbon would compound the over-aerated, low-loading condition.

**QUESTION 2**

SINGLE CHOICE

Under a typical NPDES industrial wastewater discharge permit, which of the following violations requires immediate verbal notification to the permitting authority, regardless of the specific permit's standard reporting schedule?

- ☐ A A monthly average BOD value that exceeds the permit limit by 1 mg/L
- ☒ B Any bypass or upset that creates an imminent danger to human health or the environment
- ☐ C A pH excursion lasting 30 minutes during a routine shift change
- ☐ D A single TSS sample result that exceeds the daily maximum by 2 mg/L

**ANSWER B**

**WHY** 40 CFR 122.41 and equivalent state regulations require that any bypass or upset that may cause an imminent danger to human health or the environment be reported orally within 24 hours. Routine minor exceedances of monitoring parameters follow the permit's normal reporting schedule (typically the next Discharge Monitoring Report) and do not trigger immediate verbal notification on their own.

**QUESTION 3**

SINGLE CHOICE

A Class A operator notes a steadily rising sludge blanket in the secondary clarifier over a 12-hour shift, with no corresponding increase in surface overflow rate. The blanket is approaching the clarifier's effluent weirs. Which condition is the most likely cause?

- ☐ A Excessive return activated sludge (RAS) flow rate
- ☒ B Filamentous bulking in the aeration basin
- ☐ C Excessive dissolved oxygen in the aeration basin
- ☐ D Low mixed liquor temperature

**ANSWER B**

**WHY** A rising sludge blanket that is not explained by hydraulic overload is a classic sign of poor sludge compaction, most commonly caused by filamentous bulking in the aeration basin. Filamentous organisms interfere with settling, causing solids to accumulate in the clarifier until they threaten solids loss over the weirs. Excessive RAS would actually lower the blanket; high DO and low temperature are not primary causes of rising blanket under normal hydraulic loading.

**QUESTION 4**

SINGLE CHOICE

In a typical industrial wastewater treatment plant headworks, what is the primary purpose of grit removal?

- ☐ A To remove dissolved organic load before primary clarification
- ☒ B To remove inorganic settleable solids to protect downstream equipment and prevent accumulation in digesters
- ☐ C To equalize flow variations between shifts
- ☐ D To remove oil and grease using skimmers

**ANSWER B**

**WHY** Grit consists of sand, gravel, and other heavy inorganic particles. Grit removal protects pumps, aeration equipment, and piping from abrasion and prevents grit from accumulating in downstream processes, particularly in primary clarifiers and anaerobic digesters where it reduces usable volume. It does not address dissolved organics, flow equalization, or oil/grease removal.

**QUESTION 5**

MULTIPLE CHOICE

Under NPDES permit requirements applicable to industrial wastewater facilities in Colorado, which of the following must be maintained on site and available for inspector review? (Choose two.)

- ☒ A Records of all calibration and maintenance of monitoring instrumentation
- ☐ B Personal phone records of the lead operator
- ☒ C Records of all discharges, bypasses, and upsets
- ☐ D Employee medical records unrelated to wastewater operations

**ANSWER A • C**

**WHY** NPDES permits (40 CFR 122.41 and Colorado Discharge Permit System regulations) require the permittee to retain records of monitoring activities, including instrument calibration and maintenance, as well as records of any bypasses, upsets, or noncompliance events. Personal phone records and unrelated medical records are not required wastewater records and would not be appropriate to retain as part of permit compliance documentation.

**QUESTION 6**

SINGLE CHOICE

A Class A operator is performing breakpoint chlorination on a secondary effluent with high ammonia. After adding sufficient chlorine, the chlorine residual on a DPD test suddenly rises from 0.2 mg/L to 2.5 mg/L. This change indicates:

- ☒ **A** Free chlorine residual has formed because ammonia has been fully oxidized to nitrogen gas
- ☐ **B** The test reagent is contaminated and should be replaced
- ☐ **C** Combined chlorine residual has increased, indicating more chloramines are being formed
- ☐ **D** Sulfite reducing agents in the effluent are consuming the chlorine

**ANSWER A**

**WHY** Breakpoint chlorination proceeds in stages: chlorine first reacts with ammonia to form chloramines, then at higher doses the chloramines are oxidized. Once the ammonia has been fully destroyed (the breakpoint), additional chlorine remains as free chlorine residual, which appears as a sharp increase on a DPD residual chlorine test. This is the desired endpoint for producing a stable free chlorine residual for disinfection.

**QUESTION 7**

SINGLE CHOICE

During routine monitoring of an anaerobic digester, a Class A operator observes that volatile acids (VA) concentration has increased while alkalinity has remained stable, and the pH has dropped from 7.1 to 6.8. The most likely cause is:

- ☒ **A** An imbalance in the digestion process with acid-forming organisms outpacing methanogens
- ☐ **B** Normal operation indicating complete digestion of organic matter
- ☐ **C** Excessive heating coil temperature denaturing the digester contents
- ☐ **D** Calcium carbonate scaling on the gas collection piping

**ANSWER A**

**WHY** In anaerobic digestion, methane-forming bacteria convert volatile acids to biogas. When volatile acids accumulate and pH drops, methanogens are being inhibited or overloaded, allowing acid-forming bacteria to dominate. This is the classic early indicator of digester upset. Stable alkalinity with falling pH and rising VA points to acid accumulation rather than normal operation, and the issue is biological, not mechanical scaling or temperature-related unless those symptoms match.

**QUESTION 8**

TRUE FALSE

A Class A operator must follow confined space entry procedures, including atmospheric testing and an attendant stationed outside the space, whenever work is performed inside a wet well, digester, or similar permit-required confined space, even if the space has been ventilated.

☒ **A** True☐ **B** False**ANSWER A**

**WHY** True. OSHA 29 CFR 1910.146 requires that entry into a permit-required confined space only occur after atmospheric testing for oxygen, flammability, and toxicity, and only with an attendant stationed outside the space, rescue equipment in place, and an entry permit. Ventilation alone does not eliminate these requirements, because atmospheric conditions can change at any time.

**QUESTION 9**

SINGLE CHOICE

When performing a standard 5-day biochemical oxygen demand (BOD<sub>5</sub>) test, which condition must be met for the result to be valid?

☒ **A** The final dissolved oxygen reading must be at least 2.0 mg/L and the depletion at least 2.0 mg/L☐ **B** The sample must be incubated at 37 °C for 5 days☐ **C** The initial dissolved oxygen of the dilution water must be at least 9.0 mg/L☐ **D** The seed material must be omitted if the sample is from a municipal wastewater**ANSWER A**

**WHY** Standard Methods 5210B requires that for a valid BOD<sub>5</sub> result, the final dissolved oxygen be at least 2.0 mg/L and the DO depletion be at least 2.0 mg/L. Incubation is at 20 °C (±1 °C), not 37 °C. If DO depletion is less than 2.0 mg/L, the result is unreliable and a different dilution must be used. Industrial wastewaters and many other samples require seeding to provide acclimated microorganisms.