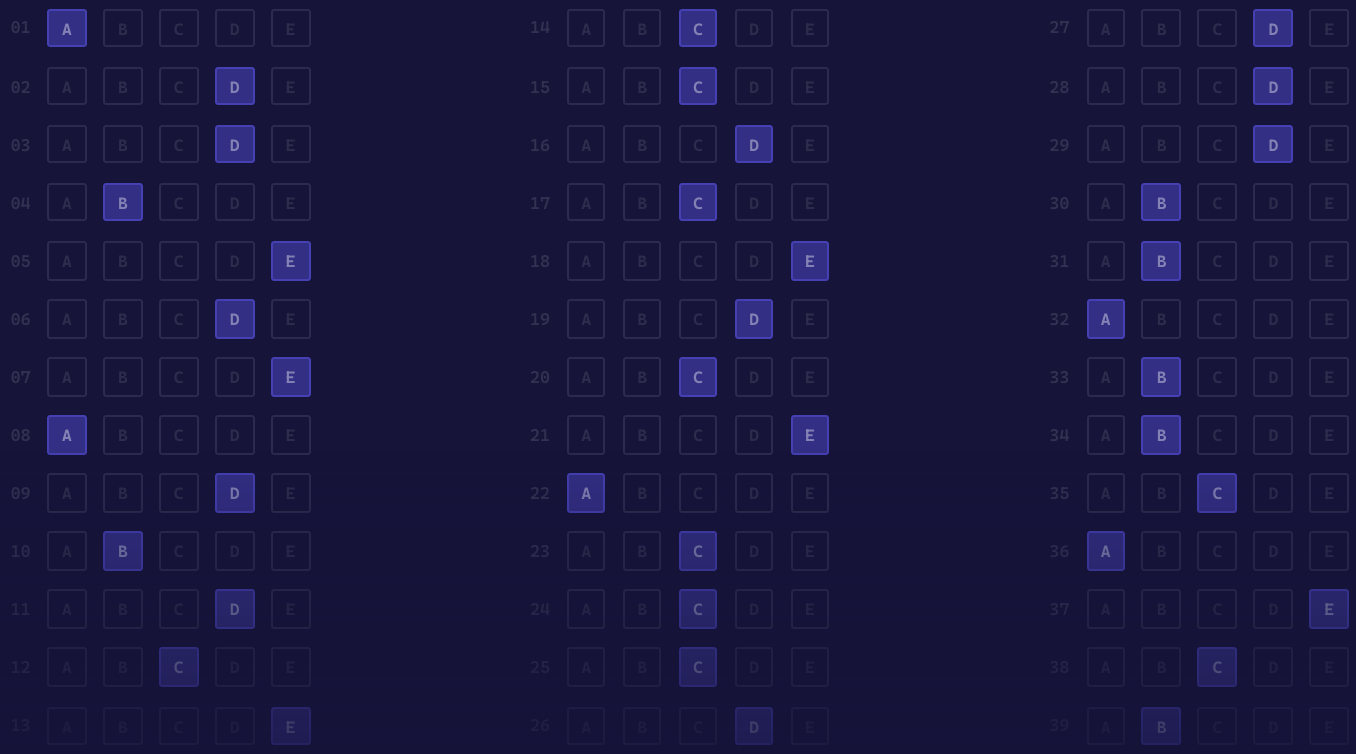
MOMETRIX
SMARTER PREP. BETTER RESULTS.




PRACTICE QUESTIONS

## ABC-MO: Missouri Department of Natural Resources

# ERGLDLCU

Wastewater Treatment Level B (WW-B)

| 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 ABC-MO: Missouri Department of Natural Resources `ERGLDLCU`, 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, `ERGLDLCU`
- the question number
- the email address on your order

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

mometrix.net

**QUESTION 1** MULTIPLE CHOICE

Which of the following factors directly affect the food-to-microorganism ratio (F/M) in an activated sludge system? (Choose two.)

**A** **Influent BOD5 loading rate to the aeration tank**

**B** **Mixed liquor suspended solids (MLSS) concentration in the aeration tank**

C Clarifier surface overflow rate

D Return activated sludge (RAS) flow rate

**ANSWER** **A** · **B**

**WHY** The F/M ratio is calculated as the BOD loading (lb/day) entering the aeration tank divided by the pounds of mixed liquor volatile suspended solids (MLVSS) or MLSS under aeration. Therefore, the influent BOD5 loading and the MLSS/MLVSS concentration directly determine F/M. Clarifier overflow rate and RAS flow rate affect solids inventory and clarification but are not direct inputs to the F/M equation.

**QUESTION 2** MULTIPLE CHOICE

Which two of the following observations in an activated sludge aeration tank are typically associated with a young, under-aerated sludge? (Choose two.)

**A** **Foam and froth on the aeration tank surface**

**B** **Pin floc and very turbid mixed liquor**

C Dark brown, almost black mixed liquor color

D Very high effluent BOD with clear, pinpoint floc

**ANSWER** **A** · **B**

**WHY** A young (low MCRT) or under-aerated sludge commonly produces pinpoint floc, a turbid effluent-like appearance, and may have frothing/foaming. A dark brown to black mixed liquor color is more typical of old sludge or septicity, and high effluent BOD with pinpoint floc indicates poor flocculation rather than a primary young-sludge signature alone.

**QUESTION 3** SINGLE CHOICE

What is the principal purpose of primary clarification in a conventional wastewater treatment plant?

A To remove dissolved organic matter by biological oxidation

**B To reduce suspended solids and settleable solids through gravity settling**

C To destroy pathogenic organisms by chlorination

D To remove nutrients such as nitrogen and phosphorus chemically

**ANSWER B**

**WHY** Primary clarification uses gravity settling to remove readily settleable solids and a portion of the suspended solids (typically 50–70%) and BOD5 (typically 25–35%). Biological oxidation occurs in secondary treatment, disinfection in tertiary/post-treatment, and nutrient removal is performed in dedicated nutrient removal processes.

**QUESTION 4** SINGLE CHOICE

Which activated sludge operational parameter is defined as the average number of days that activated sludge solids remain in the aeration system?

**A Mean Cell Residence Time (MCRT)**

B Hydraulic Retention Time (HRT)

C Food-to-Microorganism ratio (F/M)

D Sludge Volume Index (SVI)

**ANSWER A**

**WHY** Mean Cell Residence Time (MCRT), also called Solids Retention Time (SRT), is the average time activated sludge solids remain in the aeration system. It is calculated by dividing the pounds of solids in the aeration tank by the pounds of solids wasted per day. HRT refers to hydraulic retention, F/M is a loading ratio, and SVI is a settling characteristic.

mometrix.net

**QUESTION 5** SINGLE CHOICE

In a trickling filter treatment process, what is the primary role of the distributor arm?

A To pump settled sludge to the digester

**B To evenly apply wastewater over the surface of the filter media**

C To provide compressed air to the underdrain system

D To recirculate effluent from the secondary clarifier

**ANSWER B**

**WHY** A trickling filter distributor arm rotates over the media and applies wastewater evenly across the surface so that it trickles down through the biological slime layer. Sludge pumping, aeration, and recirculation are performed by other plant systems.

**QUESTION 6** SINGLE CHOICE

A high Sludge Volume Index (SVI) value in an activated sludge system most likely indicates which condition?

**A Poor-settling, bulking sludge in the secondary clarifier**

B Excessive wasting causing a young, low-MCRT sludge

C Insufficient aeration causing a black, septic mixed liquor

D Normal, well-flocculated sludge with excellent settling

**ANSWER A**

**WHY** SVI is calculated as the volume (mL) occupied by 1 gram of activated sludge after 30 minutes of settling. A high SVI (commonly above about 150 mL/g) indicates poor settling, often due to bulking filamentous organisms. Normal, healthy sludge typically has an SVI in the range of roughly 50–150 mL/g.

mometrix.net

**QUESTION 7** SINGLE CHOICE

Which preliminary treatment device is specifically designed to remove rags, strings, and larger debris that could otherwise clog downstream pumps and equipment?

A Grit chamber

**B Comminutor**

C Parshall flume

D Scum baffle

**ANSWER B**

**WHY** A comminutor (or bar screen followed by a grinder) cuts and shreds rags, strings, plastics, and other large debris so they will not clog pumps or damage downstream equipment. Grit chambers remove inorganic particles such as sand, a Parshall flume measures flow, and scum baffles retain floating material at clarifier surfaces.

**QUESTION 8** SINGLE CHOICE

In anaerobic digestion, the conversion of volatile acids into methane and carbon dioxide is performed by which group of microorganisms?

A Acidogenic bacteria

B Hydrolytic bacteria

**C Methanogenic bacteria**

D Nitrifying bacteria

**ANSWER C**

**WHY** Anaerobic digestion occurs in four general stages—hydrolysis, acidogenesis, acetogenesis, and methanogenesis. Methanogenic (methane-forming) bacteria are responsible for the final step of converting volatile acids (primarily acetic acid) into methane ($CH_4$) and carbon dioxide ($CO_2$). Nitrifying bacteria are aerobic and are not part of anaerobic digestion.

mometrix.net

**QUESTION 9** SINGLE CHOICE

Which dissolved oxygen (DO) range is generally considered the operational target for a conventional activated sludge aeration tank?

A 0.0 to 0.5 mg/L

**B 1.5 to 3.0 mg/L**

C 4.0 to 6.0 mg/L

D Greater than 8.0 mg/L

**ANSWER B**

**WHY** A conventional activated sludge aeration tank is commonly targeted at approximately 1.5–3.0 mg/L of dissolved oxygen to maintain aerobic conditions and prevent septicity without wasteful over-aeration. Values below about 0.5 mg/L typically indicate oxygen-starved conditions, while sustained levels well above 3 mg/L are generally not necessary and waste energy.

mometrix.net