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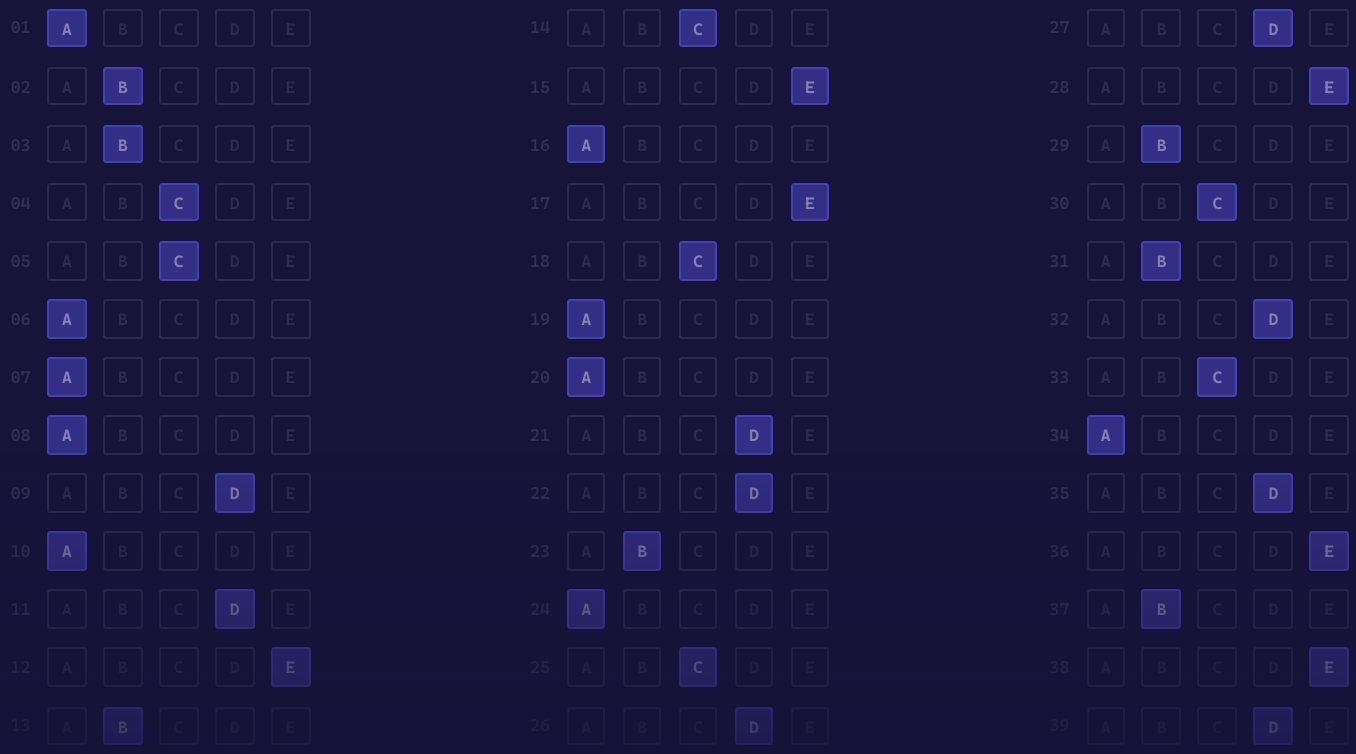

PRACTICE QUESTIONS

Association of Boards of Certification

LA9QHRYD

WPI Biological Industrial Waste Operator Class 3

EDITION	QUESTIONS	FORMAT
Demo	9	Limited Edition PDF

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Before you begin

What this is

9 practice questions for Association of Boards of Certification `LA9QHRYD`, 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, `LA9QHRYD`
- 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

In the activated sludge process, which group of microorganisms is primarily responsible for the removal of soluble organic matter (carbonaceous BOD) under aerobic conditions?

A Nitrifying bacteria such as Nitrosomonas

B Sulfate-reducing bacteria such as Desulfovibrio

C Heterotrophic bacteria in the floc-forming biomass

D Photosynthetic algae such as Chlorella

ANSWER C

WHY Heterotrophic floc-forming bacteria (such as Zoogleal-type organisms) oxidize soluble carbonaceous BOD in the aeration tank. Nitrifiers oxidize ammonia, sulfate reducers work anaerobically, and algae are not the primary BOD removers in activated sludge.

QUESTION 2 SINGLE CHOICE

An industrial wastewater contains a high concentration of biodegradable organic compounds that exert a sudden oxygen demand in a receiving stream. Which BOD measurement is most appropriate to size equalization and biological treatment units to handle this discharge?

A Ultimate (BODL) carbonaceous BOD over 20 days

B The 5-day carbonaceous BOD ($CBOD_5$)

C The 5-day BOD after nitrification has been inhibited ($CBOD_5$)

D The theoretical oxygen demand (ThOD) calculated from the chemical formula

ANSWER B

WHY Standard $CBOD_5$ is the basis used in regulator permits and unit design for industrial discharges to streams; ultimate BOD takes too long to run, the nitrification-inhibited version is used for nitrified effluents, and ThOD does not reflect actual biodegradability.

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QUESTION 3 SINGLE CHOICE

In a dissolved air flotation (DAF) unit for thickening waste-activated sludge, the principal purpose of saturating the recycle stream with air under pressure is to:

A Chemically oxidize the solids to improve dewaterability

B Reduce the dissolved oxygen demand in the aeration basin

C Form microscopic air bubbles that attach to floc particles and float them

D Strip ammonia from the sludge prior to thickening

ANSWER C

WHY Pressurizing the recycle stream dissolves air that comes out of solution as fine bubbles when the pressure is released, attaching to floc and floating it. DAF does not oxidize solids, strip ammonia, or affect aeration basin demand.

QUESTION 4 SINGLE CHOICE

During routine microscopic examination of activated sludge, the operator observes large numbers of stalked ciliates and rotifers, with very few flagellates or amoeba. This indicates the sludge is:

A Young and very poorly established (low loading)

B In poor condition with high effluent turbidity expected

C Mature and stable with good effluent quality expected

D Septic and producing hydrogen sulfide

ANSWER C

WHY Higher-life ciliates and rotifers dominate in mature, stable, low-loading systems and correlate with clear, low-turbidity effluent. Flagellates and amoebas dominate in young, overloaded systems.

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QUESTION 5 SINGLE CHOICE

An industrial facility neutralizes a strong acid waste with caustic soda in a flow-through neutralization tank. Which on-line meter provides the most direct, continuous indication of whether the treated effluent is within the permitted pH range?

A Conductivity meter

B Oxidation-reduction potential (ORP) meter

C Inline pH meter

D Total dissolved solids (TDS) meter

ANSWER C

WHY An inline pH meter directly measures the parameter of interest for the neutralization process and is used for continuous compliance with permit pH limits. Conductivity, ORP, and TDS reflect other chemical conditions but not pH itself.

QUESTION 6 SINGLE CHOICE

In an anaerobic digester receiving industrial sludge, the operator notes a sudden drop in pH, a sharp rise in volatile acids, and a noticeable decrease in gas production. The most likely interpretation is:

A Methanogenic archaea are overloaded and inhibited; the digester is becoming 'soured'

B Sulfate-reducing bacteria are winning the competition and producing methane

C The digester temperature has risen into the thermophilic optimum

D The digester has lost all nitrate and is operating normally

ANSWER A

WHY A falling pH with rising volatile acids and falling gas production is the classic signature of a sour digester in which the slower-growing methanogens cannot keep pace with the acid formers and are inhibited. Sulfate reducers would not raise methane, thermophilic temperatures would not lower pH, and nitrate loss is not indicated by these data.

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QUESTION 7 SINGLE CHOICE

An industrial plant discharges wastewater containing emulsified oils and greases. The most appropriate pretreatment device to remove the bulk of this material before it enters the publicly owned treatment works is:

A **A gravity API or corrugated plate interceptor (CPI) oil/water separator followed by a dissolved air flotation (DAF) unit**

B A spray nozzle aeration basin ahead of the equalization tank

C A bar screen and grit chamber

D A pure-oxygen activated sludge system

ANSWER A

WHY Emulsified and free oils are removed by gravity separation in an API/CPI separator, with DAF following for finer emulsions. Aeration basins mix rather than separate, bar screens and grit chambers handle very different materials, and pure-oxygen activated sludge is biological, not oil-removal.

QUESTION 8 SINGLE CHOICE

A worker is overcome by hydrogen sulfide while performing routine sampling at the headworks of an industrial pretreatment facility. The FIRST immediate action the operator should take is to:

A Don a self-contained breathing apparatus (SCBA) and enter to perform a rescue

B Don an air-purifying respirator and quickly pull the worker out

C **Activate the emergency response plan, alert emergency services, and use non-entry retrieval equipment if available**

D Ventilate the area with a portable fan before attempting any rescue

ANSWER C

WHY Confined-space entry onto a worker overcome in a hazardous atmosphere must follow the emergency response plan: summon trained/equipped rescuers, never enter without proper PPE, and use non-entry retrieval when feasible. Air-purifying respirators must not be used in oxygen-deficient or IDLH atmospheres, and ventilation alone is not adequate protection for rescuers.

QUESTION 9 SINGLE CHOICE

A worker is performing routine sampling at the influent well of an industrial pretreatment facility. The operator on duty smells a rotten-egg odor and the gas monitor on the worker's multi-gas meter suddenly alarms at 10 ppm. Which hazard is being detected and what is the immediate action required?

A Methyl mercaptan; continue sampling while monitoring for higher concentrations

B **Hydrogen sulfide; the worker must evacuate the area immediately and move to fresh air**

C Ammonia; ventilate the area with portable fans and continue sampling with the face shield down

D Carbon monoxide; switch to a half-mask APR and complete the sample round

ANSWER **B**

WHY Rotten-egg odor and alarm at 10 ppm is the signature of hydrogen sulfide (H2S). OSHA's 10 ppm acceptable ceiling limit and the immediate danger to life and health (IDLH) of 100 ppm require that the worker evacuate to fresh air without delay; H2S rapidly paralyzes the olfactory nerve, so odor is not a reliable warning.

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