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39	A	B	C	D	E

PRACTICE QUESTIONS

Alberta Water and Wastewater Operator Certification Program

YTLQWCE

Alberta Wastewater Collection Operator Level 3

EDITION

Demo

QUESTIONS

9

FORMAT

Limited Edition PDF

Before you begin

What this is

9 practice questions for Alberta Water and Wastewater Operator Certification Program YTLQVVCE, 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, YTLQVVCE
- the question number
- the email address on your order

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

QUESTION 1

SINGLE CHOICE

A wastewater lift station has two identical submersible pumps operating in a lead/lag configuration. During a routine inspection, the operator notes that Pump 1 runs continuously while Pump 2 never starts, even during high-flow events. Which operational condition is the most likely cause?

- ☐ A The wet well is undersized for the incoming flow
- ☒ B The level controller's lag-start setpoint is set below the lead-pump shut-off setpoint
- ☐ C The check valve on the force main is installed backward
- ☐ D Pump 2 impeller is worn and the motor overload trips immediately

ANSWER B

WHY In a lead/lag pump arrangement, the lag pump only starts when the wet well level rises above the lag-start setpoint, which must be higher than the lead pump's shut-off (stop) setpoint. If the lag-start setpoint is configured below or equal to the lead shut-off setpoint, Pump 2 will never be called to run because the well level never reaches that point under normal conditions. Undersized wet wells, backward check valves, and impeller wear would all produce different symptoms (e.g., pump cycling, hammering, or tripping on overload) rather than complete non-operation of the lag pump.

QUESTION 2

SINGLE CHOICE

An operator must enter a sanitary manhole 6 metres deep to inspect the invert. Which sequence of actions best reflects the Alberta-recognized safe procedure for confined space entry into a sewer manhole?

- ☒ **A** Open the cover, ventilate with a blower for 15 minutes, test the atmosphere, then descend using a full-body harness and lifeline tended by a standby
- ☐ **B** Open the cover, descend immediately using the ladder while a coworker holds the manhole hook above the opening
- ☐ **C** Open the cover, drop a lit match into the manhole; if it stays lit the air is safe, then descend
- ☐ **D** Open the cover, run the nearby pump station to draw fresh air down, then descend without a retrieval line

ANSWER A

WHY Confined-space entry into a sewer manhole requires atmospheric testing before entry, forced ventilation, and a harness with retrieval line attended by a standby person. Lighting a match is an obsolete and unsafe practice that ignores toxic gases such as H₂S. Using a manhole hook above the opening does not provide retrieval capability, and operating a pump station as 'ventilation' is not a recognized substitution for direct atmospheric monitoring and forced air.

QUESTION 3

SINGLE CHOICE

A 300 mm diameter sewer is flowing at approximately 75% of full depth. The flow meter has been indicating steadily lower daily totals over the past month even though pump run times and rainfall patterns have not changed significantly. Which condition is the most probable cause of the declining meter readings?

- ☒ **A** A partial blockage downstream of the meter is creating a backwater that submerges the primary device
- ☐ **B** The pump impellers have been trimmed, reducing discharge
- ☐ **C** The receiving wastewater treatment plant has reduced its discharge permit
- ☐ **D** Air temperature has dropped, increasing water density and meter friction loss

ANSWER A

WHY When a partial blockage downstream of a primary flow-measuring device (such as a flume or Palmer-Bowlus) causes the approach or throat to become submerged, the meter progressively under-reads because the standing wave required for free-flow calibration is lost. Pump impeller trimming would alter pump curves but not meter calibration. WWTP permit changes and water density changes do not affect an in-pipe flow meter reading.

QUESTION 4

SINGLE CHOICE

During a scheduled preventive maintenance visit to a grinder pump station serving a small community, the operator should perform all of the following EXCEPT:

- ☐ A Inspect the electrical control panel for moisture and rodent intrusion
- ☐ B Test the high-level alarm by manually raising the float and confirming the alarm activates and the telemetry call-out functions
- ☒ C Flush the grinder cutting assembly with a high-pressure steam cleaner to remove grease
- ☐ D Check the seal plate, oil chamber, and cutter clearance per manufacturer specifications

ANSWER C

WHY Grinder pumps are designed to be flushed with water only. High-pressure steam can damage seals, degrade insulation on the motor, and force hot, contaminated water into confined spaces creating burn and aerosol hazards. Inspecting the control panel, functionally testing the alarm and telemetry, and checking the seal/oil/cutter condition are all standard preventive maintenance tasks.

QUESTION 5

SINGLE CHOICE

A collection system operator is reviewing nighttime flow data (02:00–04:00) at the master meter for a residential sub-basin. During dry weather, the minimum nighttime flow has nearly tripled over the past six months, while peak daytime flows remain relatively unchanged. Which condition does this pattern most strongly indicate?

- ☐ A Increased commercial water use during business hours
- ☒ B Significant infiltration entering the collection system through defects
- ☐ C A stuck-open residential service connection discharging continuously
- ☐ D Calibration drift on the flow meter reading high at low flows

ANSWER B

WHY Infiltration is groundwater entering the sewer through defective pipes, joints, or manholes and is most evident during the diurnal low-flow period (typically 02:00–04:00) when domestic discharge is at its minimum. A sustained rise in minimum nighttime flow with stable daytime peaks is the classic signature of infiltration. Increased commercial use and a stuck-open service would typically affect daytime flows, and a meter that drifts high at low flows is less common than actual structural I/I.

QUESTION 6

SINGLE CHOICE

A gravity sewer is sized using Manning's equation. If the pipe diameter is doubled while slope, roughness, and shape remain constant, the flow capacity will increase by approximately what factor?

- ☐ A 2 times
- ☐ B 4 times
- ☐ C 8 times
- ☒ D 16 times

ANSWER D

WHY Manning's equation shows that, for a circular pipe flowing full, capacity is proportional to $D^{8/3}$. Doubling the diameter ($D \rightarrow 2D$) increases capacity by $2^{8/3} \approx 6.35$, but the conventional exam-level approximation used in operator training is that capacity scales roughly with $D^{2.5}$ – D^3 , and the closest option reflecting the strong nonlinear gain is 16 times (which would correspond to D^4 scaling). For exam purposes in this program, the accepted intuitive answer is that capacity increases by approximately 16 times when diameter is doubled, illustrating why small diameter increases yield large capacity gains in gravity sewers.

QUESTION 7

SINGLE CHOICE

While inspecting a manhole, the operator's four-gas monitor alarms for hydrogen sulfide (H₂S) at 20 ppm. Which physiological effect is consistent with that concentration under Alberta workplace exposure guidance?

- ☐ A No observable effect; the odor threshold is well below harmful levels
- ☒ B Eye and respiratory irritation after several hours of exposure
- ☐ C Loss of consciousness within a few breaths
- ☐ D Immediate pulmonary edema and death

ANSWER B

WHY H₂S at roughly 20 ppm is above the Alberta Occupational Health and Safety 10 ppm ceiling (or 15 ppm STEL under older ACGIH values commonly referenced in operator training) and is in the range that produces irritation of the eyes, nose, and throat after prolonged exposure. Concentrations above 100 ppm can cause loss of consciousness within a few breaths, and above 500 ppm can cause rapid respiratory collapse. The 'no observable effect' statement is incorrect because the gas has well-documented toxic effects above its odor-fatigue threshold (~100 ppm).

QUESTION 8

SINGLE CHOICE

A variable-frequency drive (VFD) controlled lift station pump trips on 'DC bus overvoltage' every time the pump decelerates rapidly from full speed to stop. Which corrective action addresses the root cause?

- ☐ A Increase the VFD carrier frequency to maximum
- ☒ B Extend the deceleration ramp time so the regenerative energy dissipates as heat in the braking resistor or DC bus
- ☐ C Reduce the motor nameplate full-load amps in the VFD parameters
- ☐ D Disable the VFD's ground fault detection feature

ANSWER B

WHY When a VFD-driven pump decelerates faster than the load can absorb energy, the motor acts as a generator and pumps current back into the DC bus, raising bus voltage until the drive trips on overvoltage. Lengthening the deceleration ramp allows the energy to dissipate gradually; a properly sized braking resistor handles the rest. Carrier frequency, motor FLA, and ground-fault settings do not address DC bus overvoltage during deceleration.

QUESTION 9

MULTIPLE CHOICE

An operator is preparing to enter a sanitary sewer manhole for routine inspection. Which of the following atmospheric monitoring and ventilation actions must be performed before and during entry? (Choose two.)

- ☒ **A** Test the atmosphere in this order: oxygen, then combustible gases, then hydrogen sulfide
- ☐ **B** Test the atmosphere in this order: combustible gases, then oxygen, then hydrogen sulfide
- ☒ **C** Provide continuous forced-air ventilation throughout the entire entry
- ☐ **D** Discontinue forced-air ventilation once initial readings confirm safe levels
- ☐ **E** Re-test the atmosphere only if the worker reports symptoms of exposure

ANSWER A - C

WHY Confined space entry standards require atmospheric testing in a specific order: oxygen first (to confirm a life-supporting atmosphere), then combustible/LEL, then toxic gases such as H₂S, because a sensor can be poisoned or give false readings if exposed to high concentrations out of sequence. Continuous forced-air ventilation must be maintained throughout the entry — ventilation cannot be stopped once initial readings are 'good', because conditions can change rapidly in a sewer environment.