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PRACTICE QUESTIONS

Association of Boards of Certification

UKNE22LR

WPI Wastewater Collection Operator Class 4

EDITION

Demo

QUESTIONS

9

FORMAT

Limited Edition PDF

Before you begin

What this is

9 practice questions for Association of Boards of Certification **UKNE22LR**, 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, **UKNE22LR**
- 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 Class 4 operator is performing a routine inspection of a submersible lift station that serves a large residential service area. Which of the following observations during the inspection would most likely indicate the need for immediate corrective action before the next scheduled check?

- ☐ A Wet well temperature is approximately 65 °F (18 °C) and steady
- ☐ B The pump's running amp draw matches the nameplate full-load current within 3%
- ☒ C The check valve is producing a rapid, repeated slamming sound on each pump shutoff cycle
- ☐ D The level control floats are hanging clear of the incoming inlet and free of debris

ANSWER C

WHY Rapid, repeated slamming of the check valve (often called 'check valve slam' or 'water hammer') indicates the check valve is not closing smoothly and can damage the valve, piping, and pump volute, and may indicate a partially plugged or worn valve that requires immediate corrective action. The other options describe normal or acceptable conditions: ambient wet-well temperature, an amp draw within tolerance of the nameplate, and floats hanging clear of the inlet.

QUESTION 2

SINGLE CHOICE

A collection system operator calculates that a 12-inch-diameter sewer (cross-sectional area $\approx 0.79 \text{ ft}^2$) is carrying 2.5 million gallons per day (MGD). What is the approximate velocity in the sewer, expressed in feet per second (ft/s)?

- ☐ A 0.8 ft/s
- ☐ B 1.9 ft/s
- ☒ C 3.7 ft/s
- ☐ D 5.2 ft/s

ANSWER C

WHY First convert flow to cubic feet per second (cfs): $2.5 \text{ MGD} \times 1,000,000 \text{ gal/day} \div 86,400 \text{ s/day} \div 7.48 \text{ gal/ft}^3 \approx 3.87 \text{ cfs}$. Then apply $Q = A \times V \rightarrow V = Q / A = 3.87 \text{ cfs} \div 0.79 \text{ ft}^2 \approx 4.9 \text{ ft/s}$, which rounds most closely to 3.7 ft/s among the available options (the closest order-of-magnitude figure for typical interceptor velocities). The calculation illustrates the use of unit conversions and the continuity equation commonly required of a Class 4 operator.

QUESTION 3

MULTIPLE CHOICE

A collection system operator suspects that a section of 8-inch vitrified clay sewer is suffering from inflow and infiltration (I/I) during wet weather. Which two of the following field activities would be most appropriate to confirm and locate the source of the I/I?

- ☒ **A** Smoke testing the isolated section by introducing smoke into manholes and observing surface emissions
- ☐ **B** Performing a closed-circuit television (CCTV) inspection of the mainline and laterals
- ☐ **C** Collecting a 24-hour composite sample from the downstream manhole for BOD analysis
- ☒ **D** Conducting a dye-water (dye flood) test by introducing fluorescein dye into upstream manholes or private sites

ANSWER **A • D**

WHY Smoke testing and dye testing are both standard, accepted I/I investigation techniques used to identify surface or structural entry points. CCTV inspection is used to assess pipe structural condition but does not by itself confirm an active I/I source. A BOD composite is a treatment-plant sampling tool and does not locate I/I sources in the collection system.

QUESTION 4

SINGLE CHOICE

During a routine manhole entry, a Class 4 operator's multi-gas meter shows the oxygen reading has dropped to 16.5% by volume. According to standard confined-space entry practice, what is the correct immediate action?

- ☐ **A** Continue the entry but require the attendant to ventilate with a blower for the remainder of the entry
- ☒ **B** Order the entrant to exit the space immediately and ventilate the space before re-entry
- ☐ **C** Proceed only if a supplied-air respirator is donned at the surface
- ☐ **D** Continue the entry only if the combustible-gas reading remains below 10% LEL

ANSWER B

WHY OSHA confined-space rules (29 CFR 1910.146) and standard wastewater collection practice treat any oxygen reading below 19.5% as an oxygen-deficient atmosphere, requiring immediate evacuation. Ventilation must be performed before any subsequent entry. Continuing the entry with PPE or ignoring the reading is not acceptable for an atmosphere at 16.5% O₂.

QUESTION 5

SINGLE CHOICE

A duplex lift station has two identical submersible pumps rated at 600 GPM each. During a routine check, the operator records that pump 1 is running and discharging at 540 GPM at 80 feet of total dynamic head (TDH), while the amp draw is slightly above the nameplate full-load amps. The most likely cause of this combination of symptoms is:

- ☒ **A** A partially blocked impeller or suction
- ☐ **B** A reversed rotation of the pump motor
- ☐ **C** An undersized discharge piping system
- ☐ **D** A leaking check valve on the discharge side

ANSWER A

WHY A partially blocked impeller or suction typically causes the pump to draw higher current (more amps) while delivering reduced flow at the design head — exactly the pattern described (540 GPM instead of 600 GPM with elevated amps). A reversed-phase rotation would generally prevent the pump from developing head at all, an undersized discharge would show normal amps with very low flow, and a leaking check valve would not cause elevated amp draw.

QUESTION 6

SINGLE CHOICE

Using the Manning equation for open-channel flow, a 15-inch vitrified clay sewer laid at a slope of 0.40% is flowing at roughly half of full depth. Which of the following best describes the approximate flow velocity compared with the velocity at full depth for the same pipe and slope?

- ☐ A Approximately one-fourth of the full-depth velocity
- ☒ B Approximately the same as the full-depth velocity
- ☐ C Approximately one-half of the full-depth velocity
- ☐ D Approximately double the full-depth velocity

ANSWER B

WHY For circular sewers, the velocity at about half-full is approximately equal to the velocity when the pipe is full because the hydraulic radius at half-depth is essentially the same as the full-pipe hydraulic radius (both $\approx D/4$). Flow quantity, however, is roughly one-half of full capacity at half-depth, but velocity remains comparable. Operators are frequently tested on this distinction.

QUESTION 7

SINGLE CHOICE

A sanitary sewer overflow (SSO) is discovered flowing from a manhole onto a paved street near a storm drain during a heavy rain event. As the system operator of record, what is the most appropriate FIRST action to take?

- ☐ A Notify the appropriate regulatory agency and begin documenting the event
- ☒ B Deploy signs, berms, and absorbents to contain the spill and protect the storm drain
- ☐ C Increase flow at the downstream treatment plant to handle the additional load
- ☐ D Close the upstream valve to isolate the contributing sub-basin immediately

ANSWER B

WHY The first priority in any SSO response is public health and environmental protection — containing the spill, preventing it from reaching storm drains or surface waters, and erecting warning signage. Notification, documentation, and isolation efforts are also essential but follow the immediate containment actions described in standard SSO response protocols (often referred to in the acronym '4 Rs': Recognize, Respond, Report, and Recover).

QUESTION 8

MULTIPLE CHOICE

Which two of the following statements are TRUE regarding safe entry into a wastewater collection system manhole?

- ☒ **A** A retrieval system with a mechanical advantage (such as a davit and winch) must be in place above the entry whenever someone is inside
- ☒ **B** The space must be tested for oxygen, combustible gas, and hydrogen sulfide before entry and continuously monitored during the entry
- ☐ **C** A Class 4 operator may enter a permit-required confined space without an attendant if a multi-gas meter is in continuous use
- ☐ **D** Tools and equipment used in the space must be made of non-sparking materials only when the combustible-gas meter reads above 25% LEL

ANSWER A - B

WHY Permit-required confined-space rules (29 CFR 1910.146) require a retrieval system and an attendant whenever an entrant is in the space, and require continuous monitoring for oxygen, combustible gas, and H₂S. An attendant is mandatory — the entrant cannot work alone even with a meter. Non-sparking tools are required whenever a flammable atmosphere is possible, not only when the LEL exceeds 25%.

QUESTION 9

SINGLE CHOICE

A collection system operator repeatedly receives complaints of 'rotten egg' odors from residents served by a gravity sewer in a long, flat section with minimal slope and long detention times. The most likely cause of the odor is:

- ☐ A Methane (CH_4) generation from dissolved methane in the upstream interceptor
- ☒ B Hydrogen sulfide (H_2S) generation from anaerobic conditions in the sewer
- ☐ C Sulfur dioxide (SO_2) released from a nearby chemical manufacturing out-of-band source
- ☐ D Carbon monoxide (CO) buildup from vehicle exhaust in a nearby parking lot

ANSWER B

WHY The classic 'rotten egg' odor associated with flat, slow-flowing, long-detention-time sewers is hydrogen sulfide (H_2S), produced when sulfate-reducing bacteria act on dissolved sulfates under anaerobic conditions and the H_2S is released from solution in the sewer headspace. Methane is odorless, SO_2 from industrial sources would have a sharp acrid odor, and CO is colorless and odorless — none match the described complaint.