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CIVIL ENGINEERING LEVEL 6

CON/OS/CET/CR/10/6

Construct Wastewater Infrastructures

March/April 2026

TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION COUNCIL (TVET CDACC)

WRITTEN ASSESSMENT

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATE

1. Marks for each question are indicated in the brackets.
2. The paper consists of **TWO** sections: **A** and **B**.
3. Attempt **ALL** the questions in section A and any **THREE (3)** questions in section B.
4. Candidates are provided with a separate answer booklet
5. **DO NOT** write on this question paper.

This paper consists of THREE (3) printed pages.

Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.

SECTION A (40 MARKS)

Answer all questions in this section

1. During excavation for sewer pipeline trenches, soil conditions directly influence the likelihood of trench collapse or failure. State FOUR soil-related factors that affect trench stability during sewer pipeline excavation. 4 Marks)
2. Before construction of a gravity sewer pipeline system begins, engineers rely on drawings to extract essential project information. List FOUR information obtained from sewer pipeline working drawings. (4 Marks)
3. Setting out a gravity sewer pipeline requires specific tools to achieve correct alignment, levels, and dimensions on site. List FOUR tools used when setting out sewer pipeline works. (4 Marks)
4. Temporary works are executed on most sewer pipeline construction sites. State FOUR functions of temporary works during sewer pipeline construction. (4 Marks)
5. Construction of a sewer pipeline system involves the use of heavy plant and machinery that pose safety risks if not properly managed. State FOUR safety precautions to be observed when operating construction plant during sewer pipeline construction. (4 Marks)
6. Proper handling and storage of construction materials is necessary to prevent damage, loss, and deterioration on sewer pipeline construction sites. Name FOUR methods used to store construction materials for sewer pipeline works. (4 Marks)
7. During construction of reinforced concrete septic tanks, water tightness is essential to ensure effective wastewater containment and environmental protection. List FOUR reasons for ensuring water tightness in septic tank construction. (4 Marks)
8. During execution of sewer pipeline construction works, the contractor is required to document construction progress for monitoring and payment purposes. List FOUR items commonly included in a sewer construction progress report. (4 Marks)
9. Site supervisors are very resourceful during the construction of various wastewater sites. State FOUR responsibilities of a site supervisor in wastewater construction site. (4 Marks)
10. At the completion stage of sewer pipeline construction works, specific documents must be prepared before project handover to the client. Name FOUR documents prepared before handing over completed sewer pipeline works. (4 Marks)

SECTION B (60 MARKS)

Answer THREE questions in this section

11. A contractor has been engaged to construct pit latrines and VIP latrines for a rural settlement where individual household sanitary systems are required.
    a. Explain FOUR key construction requirements for a pit latrine or VIP latrine. (8 Marks)
    b. Describe THREE factors considered when selecting a suitable pit latrine. (6 Marks)
    c. Highlight THREE environmental risks associated with poorly constructed on-site sanitation systems. (6 Marks)
12. During construction of a sewer pipeline, accurate setting out is required to maintain the designed alignment and gradient.
    a. Explain FOUR factors that influence accurate setting out of a wastewater pipeline. (8 Marks)
    b. Describe THREE errors that may occur if setting out is done inaccurately. (6 Marks)
    c. Outline THREE measures used to control alignment and gradient during sewer construction. (6 Marks)
13. Effective construction management requires systematic recording and certification of site activities throughout sewer pipeline construction works.
    a. Highlight FOUR purposes of maintaining site records during sewer pipeline construction works. (8 Marks)
    b. Outline THREE uses of interim payment certificates in sewer pipeline construction projects. (6 Marks)
    c. Explain THREE consequences of failing to prepare proper construction documentation for sewer pipeline works. (6 Marks)
14. Sewer pipeline excavation works expose workers and surrounding environments to physical, health, and environmental hazards.
    a. Explain FOUR common hazards encountered during sewer pipeline excavation works. (8 Marks)
    b. Describe THREE control measures used to prevent accidents in deep sewer excavations. (6 Marks)
    c. Outline THREE environmental protection measures implemented during sewer pipeline construction. (6 Marks)

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