

073105T4EOP

ELECTRICAL OPERATION LEVEL 5

ENG/OS/CR/CR/06/5/A

Install Solar Systems

March/April 2025



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

WRITTEN ASSESSMENT

Time: 3 HOURS

INSTRUCTIONS TO CANDIDATE

1. This paper consists of TWO sections: **A** and **B**.
2. Marks for each question are indicated in the brackets.
3. Candidates are provided with a separate answer booklet
4. **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 the questions in this section.

1. Solar panels come in various types. List **three** different types of solar panels. (3 marks)
2. Proper maintenance not only maximizes energy production but also extends the lifespan of the solar installation. State **four** maintenance procedures for PV module. (4 marks)
3. Local climate can significantly influence solar panel selection. Explain how climate affects the choice of suitable solar panels for residential use. (2 marks)
4. Solar panels can be connected in different configurations to increase their output. Explain **two** methods of solar panel connection. (4 marks)
5. The charge controller plays a crucial role in solar systems. Explain **two** functions of a charge controller. (4 marks)
6. Cable segregation is critical in electrical installations. Explain the term cable segregation. (2 marks)
7. What do you understand by the term cable termination? (2 marks)
8. Cable lugs are essential components in electrical systems. Outline **three** types of commonly used cable lugs. (3 marks)
9. Explain the meaning of "test" in the context of electrical systems. (2 marks)
10. Explain the purpose of a short circuit test in an electrical installation. (4 marks)
11. Solar electricity is increasingly being adopted by businesses and industries in Kenya. Outline **four** applications of solar electricity in Kenya. (4 marks)
12. Batteries are part of the key components of solar system installation. List **four** maintenance tips of batteries. (4 marks)
13. State **two** functions of inverters in a solar system. (2 marks)

SECTION B (60 MARKS)

*Answer any **THREE** questions in this section*

14. a) Battery storage is an essential aspect of solar energy systems. Explain **five** considerations for selecting solar batteries. (10 marks)
- b) Solar cells, also known as photovoltaic cells, are devices that convert sunlight directly into electricity through the photovoltaic effect. Explain how this occurs. (10 marks)
15. a) A solar system consists of several key components. Draw a block diagram of the components of a solar system and describe their functions. (12 marks)
- b) When connecting solar panels, the choice between series and parallel configurations can impact system performance. Analyze **two** advantages and **two** disadvantages of each connection method. (8 marks)
16. a) A technician working for Amani Solar Company was tasked to perform maintenance of solar panels in an off-grid solar farm. Name **five** measuring instruments the technician used in the photovoltaic (PV) system maintenance and state **ONE** function of each. (10 marks)
- b) ~~Solar Photovoltaic~~ (PV) solar panels. Explain **five** factors taken into consideration when mounting solar modules. (10 marks)
17. a) List **three** types of tests used in electrical systems and explain the purpose of each. (6 marks)
- b) Describe the procedure of measuring the resistance of earth continuity in conductors. (8 marks)
- c) Technological advancements play a crucial role in solar panel development. Discuss **three** impacts of these advancements on efficiency and sustainability in solar technology. (6 marks)