071305T4EOP

ELECTRICAL OPERATION (POWER OPTION) LEVEL 5

ENG/OS/PO/CR/01/5

Perform Electrical Installation

November/December 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. Attempt **ALL** questions in section A and **ANY THREE** (3) questions in section B.
3. Marks for each question are given.
4. Candidates are provided with a separate answer booklet
5. Do not write on the question paper.

This paper consists of FOUR (4) 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)

Attempt ALL the questions in this section.

1. You are an electrician in a new bakery. The owner wants a durable system but is concerned about costs. The bakery has high humidity and frequent equipment changes. Name THREE factors to consider when choosing the best wiring system for this environment. (3 marks)
2. After installing wiring in a school laboratory, your supervisor asks you to ensure safety before handing it over. List FOUR critical tests you will do to confirm the installation is safe and compliant with regulations. (4 marks)
3. Factories with high-voltage equipment emphasize worker safety. Name THREE ways an electrical technician should apply occupational health and safety (OHS) standards while working with electrical machines. (3 marks)
4. You are designing a circuit for a small workshop with a 4-lighting circuit, 3 socket outlets circuit and one water heater circuit. State the appropriate fuse or circuit breaker ratings you would recommend for each circuit to ensure safety and proper operation. (3 marks)
   (a) Lighting
   (b) Socket outlets
   (c) Water heater
5. In an industrial project, electrical technicians often rely on design drawings before starting installations. Name THREE importance of interpreting an installation design drawing before coork. (3 marks)
6. Unbalanced loads in a three-phase system can cause equipment overheating and inefficiency. State how an electrical technician can achieve phase balancing of loads during installation. (2 marks)
7. A client wants electrical installation done in his residential house. List the recommended cable sizes for the following final sub circuit. (3 marks)
   (a) Twin socket outlets
   (b) Florescent lamps
8. Your supervisor asks you to prepare a toolkit for wiring a new apartment. Identify THREE essential hand tools would you include for the job. (3 marks)

9. In electrical installations, the method used for cable termination determines the durability and safety of the connection. As an electrical technician, name FOUR common methods of cable terminations that. (4 marks)

10. A homeowner complains of frequent circuit trips. Upon inspection, you suspect sub-standard installation. List FOUR factors would you check to confirm your suspicion.

11. You are testing a circuit with a 50A fuse and a 240V supply. Determine the maximum allowed earth fault loop resistance to ensure the fuse operates correctly during a fault.

(2 marks)

12. In building electrical installations, the placement of accessories affects both accessibility and user safety. As per standard installation practices, name the recommended height above finished floor level for the following accessories. (3 marks)
    (a) Switches
    (b) Socket outlet
    (c) Consumer control unit

13. You are installing conduit wiring in a commercial building. Name THREE IEE Regulations must be followed to ensure the installation is safe and compliant. (3 marks)

SECTION B (60 MARKS)

Attempt Any THREE Questions in This Section

14.

a) An apprentice electrician needs clarity on electrical cables. Explain FOUR differences between conductors and insulators materials. (8 marks)

b) You are training an apprentice on cable jointing. Explain the procedure of making a Tee married stranded joint. (12 marks)

15.

a) Before energizing a new installation, your supervisor wants you to perform insulation resistance tests. Describe the procedure of performing the test between conductors and earth and between conductors to ensure the system is safe and compliant. (10 marks)

b) Planning electrical installations for a residential building is critical, design and illustrate the arrangement of single-phase intake equipment using a labelled diagram, and explain the function of each component in the system. (10 marks)

16.

a) In an industrial workshop, improper load calculation often leads to electrical faults. As an electrical technician, explain SIX main steps for calculating electrical load for a new installation. (6 marks)

b) A homeowner wants to understand their. Describe THREE main components of a consumer control unit. (6 marks)

c) When planning electrical installations in an industrial plant, explain FOUR factors that must appropriate cable size for the installation. (8 marks)

17.

a) A client is planning to install trunking in their office but is uncertain about the suitable type. Describe THREE types that are suitable for office application. (6 marks)

b) In a 4-storey commercial building, uneven distribution of loads can lead to reduced efficiency of the supply system. As an electrical technician, describe how you would achieve phase balancing of loads during the electrical installation of such a building. (6 marks)

c) You are designing a power distribution system for a factory. Explain FOUR factors to consider to determine the rating of the cables used. (8 marks)