

MODULE III

AUTOMOTIVE ENGINEERING TECHNOLOGY LEVEL 5, LEVEL 6

ENG/OS/AUT/CR/02/5

Automotive Electrical Systems Maintenance

March/April 2026



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

**WRITTEN ASSESSMENT
TIME: 2 HOURS**

INSTRUCTIONS TO CANDIDATE

1. This paper consists of **TWO** sections: **A** and **B**.
2. **Answer ALL** questions in section A and **ANY THREE** (3) questions in section B.
3. Marks for each question are indicated in the brackets.
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)

Answer ALL the questions in this section.

1. You arrive at an automotive electrical workshop where tools are scattered and oil is spilled on the floor. State FOUR actions you would take to restore proper housekeeping before starting work. (4 Marks)
2. You are assigned to diagnose a vehicle electrical fault. Identify TWO appropriate PPE items you would wear and state their purpose. (2 Marks)
3. Before servicing a vehicle ignition system, state FOUR safety precautions you must observed. (4 Marks)
4. A vehicle has been brought to workshop with engine misfiring. Identify FOUR diagnostic tools you would use to check the ignition system. (4 Marks)
5. An automotive relay is an electromechanical controlled switch that is designed for DC voltages. Highlight TWO functions of a relay. (2 Marks)
6. You are asked to inspect a vehicle charging system. List FOUR components that need to be inspected on the vehicle. (4 Marks)
7. A customer complains that the battery keeps discharging time to time and need to jumpstart it time to time. State FOUR observable signs that indicate a faulty charging system. (4 Marks)
8. A vehicle fails to crank when the ignition key is turned ON position. List FOUR starting system components you would inspect first. (4 Marks)
9. Vehicle has been brought in the workshop while the headlights are not working. Identify FOUR possible lighting system faults that could cause this problem. (4 Marks)
10. In vehicle electrical systems repair electrical circuit fault is a major problem. State TWO types of electrical circuit faults in a motor vehicle. (2 Marks)

11. A sealed beam lamp is a headlight which is housed in a sealed unit containing the lens, reflector and the element. State TWO advantages of sealed beam lamp. (2 Marks)
12. Engine management system uses various sensors to monitor various aspects of the vehicle and sends information to the ECU. Highlight any FOUR engine management sensors and what they monitor. (4 marks)

SECTION B (60 MARKS)

Answer Any THREE Questions in This Section

13. Vehicle inspection goes hand in hand with the functionality of the systems.
- a) State TWO practical causes of ignition system failure. (2 Marks)
- b) Explain FOUR practical functions of an alternator when the engine is running.
- (8 Marks)
- c) Describe FIVE practical tests you would carry out to confirm correct charging system operation. (10 Marks)
14. Two vehicles were brought in the workshop with starter motor fault. During the overhaul the conclusions were made that the starter motors were different base on construction and operation.
- a) Explain SIX differentiate between an inertia starter motor and a pre-engaged starter motor based on construction and operation as used in motor vehicles. (12 Marks)
- b) A vehicle has been brought in the workshop with fault stator motor. Describe FOUR-starter motor bench tests that a technician need to perform. (8 Marks)
15. A vehicle has been brought in the workshop with fault Vehicle typical Lighting Circuit, and the customer was advised accordingly on repairs that were required.
- a) Describe the construction and operation of a typical vehicle lighting system circuit. (11 Marks)
- b) Explain THREE practical lighting system testing procedures, including tools

used.

(9 Marks)

16. A vehicle has been brought in the workshop with fault Vehicle, electrical systems, and the technician has to prepare a service documents.to be presented to the customer

a) Explain why proper service documentation is important after electrical system maintenance. (2 Marks)

b) Describe FOUR key details recorded on an automotive electrical service job card. (8 marks)

c) A multi- meter is a key tool used in diagnoses process of vehicle electrical systems. Describe step by step how you would diagnose an electrical fault on ignition and charging system using a multi-meter on a vehicle electrical system.

(10 Marks)

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