

071605T4AUT

AUTOMOTIVE TECHNICIAN LEVEL 5

ENG/OS/AUT/CR/5/5/A

SERVICE VEHICLE STEERING SYSTEM

March/April 2025



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

WRITTEN ASSESSMENT

Time: 3 HOURS

INSTRUCTIONS TO CANDIDATE This paper consists of **TWO** sections: **A** and **B**.

1. Answer **ALL** questions in section A and **ANY THREE** (3) questions in section 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 the question paper.

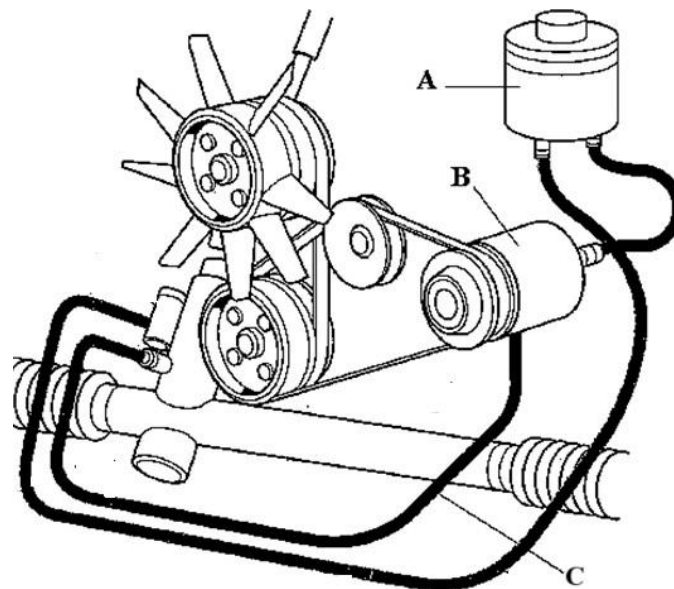
This paper consists of FOUR (4) printed pages

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

Turn over

SECTION A: (40 MARKS)***Attempt All Questions in This Section***

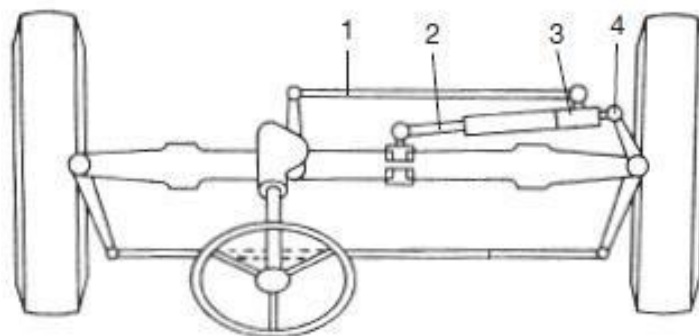
1. Motor vehicle workshop wastes are harmful to the environment when improperly disposed. Name TWO waste disposal procedures in the automotive workshop.
(4 Marks)
2. A mechanic serviced the steering system and decided to lubricate the moving parts. Explain the importance of the lubricant in the steering unit.
(2 Marks)
3. A customer complains that the steering wheel fails to return to the centre after a turn. Outline TWO possible causes of this problem.
(4 Marks)
4. A vehicle with wheel alignment problem is brought to the workshop for service. Describe ONE problem that would arise due to the following alignment issues.
 - a) Incorrect dynamic balance
 - b) Incorrect tire pressure
 - c) Improper brake adjustment(3 Marks)
5. The purpose of the steering system is to control the direction in which the vehicle travels. State FOUR requirements that must be met if it is to do this efficiently.
6. Figure 1 below shows the components of a vehicle power steering system. Outline ONE function of the components labelled A, B and C.
(3 Marks)

**Figure 1**

7. To ensure that power assisted steering remain in safe and serviceable condition, identify FOUR checks that should be carried out regularly. (4 Marks)
8. A vehicle was brought to the workshop for pre-service maintenance before embarking on a long journey. Outline FOUR maintenance checks you would carry out on the vehicle steering box. (4 Marks)
9. A technician is required to service a rack and pinion steering box.
 - a) Identify TWO special tools used while undertaking the service
 - b) List TWO safety precautions to be observed (4 Marks)
10. You are required to record service work while carrying out maintenance on the steering system on a vehicle.
 - a) Identify TWO service record you will generate (2 Marks)
 - b) Explain ONE component for each of the record identified in 10 (a). (2 Marks)
11. After finalising vehicle steering service and repair, keeping the workshop clean and tidy is an important part of fire prevention. Identify FOUR housekeeping practices in line with this. (4 Marks)

SECTION B (60 MARKS)***Attempt Any THREE Questions in This Section***

12. a) A vehicle had its old tie-rods replaced by new ones. This led to problems with its toe angles. Illustrate using sketches, the difference between the two toe angles. (10 Marks)
- b) You took a vehicle for road test. The vehicle slowly moves to one side of the road when the hands are off the steering wheel. Highlight FIVE causes of this problem. (10 Marks)
13. A customer complaint of numerous steering system problems
- a) Explain FOUR causes of each of the following these steering problems.
- i. Steering column rattling
 - ii. Power steering hiss or whistle
 - iii. Steering gear squeak (12 Marks)
- b) State FOUR possible corrections made for the following steering conditions
- i. Loose steering
 - ii. Squeaking noise while turning (8 Marks)
14. a) A vehicle running while camber and caster steering angles. Using sketches, explain the difference between these steering angles. (8 Marks)
- b) Sketch and label the rack and pinion steering gearbox, and explain how it operates. (12 Marks)
15. **Figure 2** shows a steering system of a heavy commercial vehicle.
- a) Name the components labelled 1 to 4 (4 Marks)
- b) Explain FOUR maintenance procedures performed on component 3 (8 Marks)
- c) Describe FOUR problems associated with the vehicle when component 4 is worn (8 Marks)

**Figure 2**