

071906T4AEN

AGRICULTURAL ENGINEERING LEVEL 6

ENG/OS/AGR/CR/05/6

**Demonstrate Understanding of Tractors and Power Units
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. 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)

Attempt ALL questions in this section

1. A tractor is the main source of power for operating farm implements. List FOUR characteristics of general-purpose tractors. (4 Marks)
2. Wheeled tractors are classified into four wheel and two-wheel drive tractors. Define the following terms used in wheeled tractors. (4 Marks)
3. a) Wheelbase
b) Ground clearance
c) Track
d) Turning space.
4. Heat engines can be divided into external and internal combustion engines. State ONE function of each of the following parts of an internal combustion engine. (4 Marks)
 - a) Connecting Rod
 - b) Crankshaft
 - c) Flywheel
 - d) Valves:
5. Rigorous assessments are performed in order to evaluate the performance of farm tractors. Describe TWO types of tests performed on a modern tractor before it reaches the market. (4 Marks)
6. A tractor engine cooling system controls the engine temperature. State FOUR advantages of air-cooled engines. (4 Marks)
7. Tractor test report provides standardized performance data that allows for the comparison of different tractor models. List FOUR tractor performance information that is recorded in a tractor test report. (4 Marks)
8. A clutch is a device, used to connect and disconnect the tractor engine from the transmission gears and drive wheels. Outline FOUR features of a good tractor clutch. (4 Marks)
9. Figure 1 below shows a tractor power transmission differential unit. Identify the parts labelled A, B, C and D. (4 Marks)

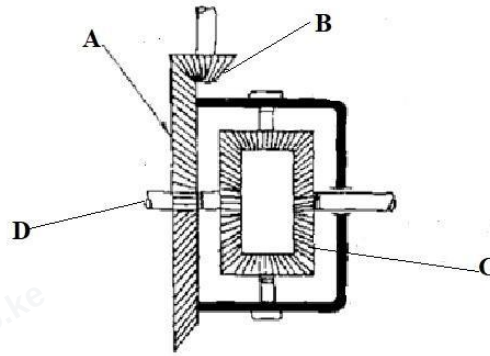


Figure 1

9. Over the years, many farmers, farm workers and others living on or visiting farms, have been killed or seriously injured as a result of falling from moving tractors, being run over by tractors, or being crushed when a tractor rolls sideways or backwards. Outline FOUR safety rules to observe when operating a tractor. (4 Marks)
10. A major agricultural equipment manufacturer is designing a new high-horsepower row crop tractor. State FOUR ergonomic principles that must be adhered to when designing the tractor. (4 Marks)

SECTION B (60 MARKS)

Attempt ANY THREE questions in this section.

11. Tractor wheel traction is a critical factor affecting tractor field performance and efficiency.

a) Explain FIVE features of tractor rear wheels. (10 Marks)

b) Explain FIVE methods a tractor operator can use to improve wheel traction. (10 Marks)

12. Internal combustion engines use different types of fuels.

a) State FIVE effects of fuel volatility on the performance of the tractor engine. (5 Marks)

b) With the aid of a diagram, explain the fuel circulation in a tractor diesel engine. (15 Marks)

13. The hitch points on a tractor are critical for connecting implements and ensuring safe and efficient power transfer.

a) Describe the construction and operation of the tractor three-point linkage.

(8 Marks) b) Explain FOUR types of tractor P.T.O. transmission systems. (12 Marks)

14. Steering system is the system governing the angular movement of front wheels of a tractor.

a) Explain FOUR advantages of a power steering system in a tractor. (8 Marks)

b) Using a well labelled diagram, explain the operation of the manual tractor steering system. (12 Marks)