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071604T4AUT**AUTOMOTIVE TECHNOLOGY LEVEL 4****ENG/OS/AUT/CR/2/4/A****SERVICE AND REPAIR VEHICLE ENGINES****July/Aug 2025**

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

WRITTEN ASSESSMENT**TIME: 2 HOURS**

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INSTRUCTIONS TO CANDIDATE1. This paper consists of two sections; **A** and **B**

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2. Answer **ALL** the question as guided in each section

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3. Marks for each question are as indicated in the brackets

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4. You are provided with a separate answer booklet to answer the questions

5. Do not write in this question paper

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This paper consists of FOUR (4) printed pages

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

SECTION A (10 MARKS)**Answer all questions in this section. Each question carries one mark**

1. Identify the main function of the crankshaft.

- A. Regulates fuel injection
 B. Controls valve timing
 C. Converts reciprocating motion of the piston to rotary motion
 D. Reduces engine noise

2. Which component controls the opening and closing of the engine's valves?

- A. Camshaft
 B. Crankshaft
 C. Piston
 D. Timing belt

3. The piston rings _____.

- A. Controls air-fuel ratio
 B. Lubricates cylinder walls
 C. Seals the combustion chamber and regulate oil
 D. Cools the engine

4. Name the specific tool used to measure cylinder bore diameter.

- A. Feeler gauge
 B. Dial gauge
 C. Micrometer

D. Bore gauge

5. The ideal air-fuel ratio for complete combustion in petrol engine is _____.

- A. 12:1
 B. 14.7:1
 C. 15.5:1
 D. 10:1

6. Identify the main cause of intake manifold to backfire in a vehicle engine.

A. Late timing

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ignition timing

B. Early

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C. Rich fuel mixture

D. Stuck open intake valve

7. The function of the timing chain in an engine is to:

A. Control fuel flow

B. Maintain compression

C. Synchronize camshaft and crankshaft

D. Reduce vibrations

8. Which component ensures that oil pressure is maintained in the lubrication system?

A. Oil seal

B. Oil filter

C. Oil pressure relief valve

D. Crankshaft

9. A bent connecting rod will most likely result in:

A. Increased oil pressure

B. Reduced engine noise

C. Low compression in one cylinder

D. Fast idle speed

10. Identify the main reason for performing a cylinder leak-down test.

A. Check fuel delivery

B. Measure oil pressure

C. Locate the source of compression loss

D. Check timing

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SECTION B (40 MARKS)***Answer all the questions in this section***

11. List FOUR main components of an internal combustion engine. (4 Marks)
12. Identify FOUR common problems that affect the engine operation. (4 Marks)
13. Name FOUR engine systems that require routine maintenance. (4 Marks)
14. State the possible cause of each of the following common engine noises. (4 Marks)
- a) Engine Knocking
 - b) Engine Squealing
 - c) Engine Grinding
 - d) Engine Rattling
15. Name FOUR benefits of regular engine servicing. (4 Marks)
16. List FOUR engine components requiring torque specification during reassembly. (4 Marks)
17. Name FOUR safety precautions to be observed when working on engines. (4 Marks)
18. Identify FOUR inspections and checks to be carried out before starting a reassembled engine. (4 Marks)
19. State FOUR reasons for replacing a timing belt/chain. (4 Marks)
20. List FOUR causes of black smoke from the exhaust system of an engine. (4 Marks)