TEVETA
Technical Education, Vocational and Entrepreneurship Training Authority

DIPLOMA IN AUTOMOTIVE ENGINEERING

LEVEL 6 YEAR I EXAMINATIONS

FINAL INTEGRATED SUMMATIVE EXAMINATIONS

SITTING: NOVEMBER/DECEMBER 2025

SUBJECT: ADVANCED MOTOR VEHICLE TECHNOLOGY

TIME: THREE (3) HRS **TOTAL MARKS: 100**

PASS MARK 50

INSTRUCTIONS TO CANDIDATE

1. Write your Examination number and National Registration Card (NRC) number on the answer booklet provided. Ensure you append your signature in the space provided on the answer booklet.
2. Write the ANSWER SCRIPT SERIAL NUMBER on the examination register and on the entry slip provided.
3. This paper consists of EIGHT (8) questions.
4. Answer FIVE (5) questions. Question ONE (1) is compulsory and any other FOUR (4) questions.
5. All questions carry equal marks.
6. Cell phones and programmable calculators are not allowed in the examination room.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

QUESTION 1 - COMPULSORY

a) Define hybrid vehicle [2 marks]

b) Identify four (4) main components of hybrid automobiles [4 marks]

c) Explain five (5) advantages of using hybrid vehicles [10 marks]

d) State four (4) alternative energy sources used in automobiles [4 marks]

TOTAL [20 marks]

QUESTION 2

a) Describe fuel cells [2 marks]

b) Describe the construction of a fuel cell [5 marks]

c) Explain the working principle of a fuel cell [5 marks]

d) Compare alternative fuels with conventional fuels with regard to:

i) Performance [2 marks]

ii) Emission [2 marks]

iii) Cost [2 marks]

TOTAL [20 marks]

QUESTION 3

a) Define an electric traction vehicle [2 marks]

b) Explain the following.

i) Electric vehicle batteries [4 marks]

ii) Drive motors [4 marks]

c) Differentiate AC Motors and DC Motors [4 marks]

d) Describe the operation of DC series wound and DC separately shunt wound motors [6 marks]

TOTAL [20 marks]

QUESTION 4

a) State four (4) cooled EGR components [4 marks]

b) State the meaning of the following acronyms:

i) DOC [2 marks]

ii) VGT [2 marks]

iii) SCR [2 marks]

iv) HPCRF [2 marks]

c) The diagrammatic layout shown in the figure below is of an electronic management system.

i) Identify the components labelled 11, 13, 15, and 17 [4 marks]

ii) State what is being monitored by the units mentioned in Q4.B(i) above [4 marks]

TOTAL [20 marks]

QUESTION 5

a) In relation to vehicle safety, Define safety. [2 marks]

b) State four (4) vehicle safety systems. [8 marks]

c) Explain the three (3) advantages of a safety belt. [6 marks]

d) State four (4) components of air bags. [4 marks]

TOTAL [20 marks]

QUESTION 6

a) Explain the purpose of central locking system. [2 marks]

b) Identify eight (8) components of the immobilizer circuit. [8 marks]

c) Explain the importance of automotive security system. [4 marks]

d) State four (4) types of alarms commonly used on modern vehicles. [4 marks]

e) Explain the term wireless remote control. [2 marks]

TOTAL [20 marks]

QUESTION 7

a) Define alarm system. [2 marks]

b) State the following acronyms.

i) SCR [1 mark]

ii) RAM [1 mark]

c) Compare and contrasting between standard manual transmission and automated manual transmission. [8 marks]

d) Explain how the I-shift transmission determines the correct gear ratio to be selected at start off. [4 marks]

e) Describe how vehicles use satellite communication technology in today's modern world. [4 marks]

TOTAL [20 marks]

QUESTION 8

a) State the four (4) benefits of networking in today's modern world [4 marks]

b) Describe the construction of an automated gearbox [6 marks]

c) Explain the principle of the operating EGR [4 marks]

d) Identify six (6) sensors found in the I-shift transmission control housing [6 marks]

TOTAL [20 marks]