

2503/205
ENGINE TECHNOLOGY AND
BODYWORK
June/July 2023
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN AUTOMOTIVE ENGINEERING
MODULE II
ENGINE TECHNOLOGY AND BODY WORK

3 hours

INSTRUCTIONS TO CANDIDATES

You should have drawing instruments for this examination.

*This paper consists of **THREE** sections; **A**, **B** and **C**.*

*Answer a total of **FIVE** questions as follows:*

***Question ONE (compulsory)** in section **A**, **TWO** questions from section **B** and **TWO** questions from section **C**.*

All questions carry equal marks.

Maximum marks for each part of a question are as shown.

Candidates should answer the questions in English.

This paper consists of 3 printed pages.

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

SECTION A

This question is compulsory.

1. (a) (i) Explain **two** types of:
 - (I) car seats;
 - (II) car seat belts;
- (ii) Explain **four** characteristics of materials used in car upholstery. (8 marks)
- (b) Describe the process of repairing a damaged panel of a car. (6 marks)
- (c) Explain the process of spray painting a vehicle body. (6 marks)

SECTION B

Answer at least TWO questions from this section.

2. (a) (i) Explain **two** methods of emission control in vehicle engines.
- (ii) Using sketches, explain the operation of a wet type air cleaner. (11 marks)
- (b) with the aid of a diagram, explain the operation of a liquefied petroleum gas system of a car. (9 marks)
3. (a) Explain **four** types of compression ignition injector nozzles. (4 marks)
- (b) With the aid of a diagram, explain the operation of a D.P.A pump. (16 marks)
4. (a) (i) State **four** advantages of a hybrid vehicle:
- (ii) Differentiate parallel hybrid from series hybrid drives. (8 marks)
- (b) With the aid of a diagram, explain the operation of a parallel hybrid drive of a car. (12 marks)

SECTION C

Answer at least TWO questions from this section.

5. (a) State **two** causes of each of the following compression ignition fuel system faults:
- (i) no fuel supply;
 - (ii) engine misfires.
- (4 marks)
- (b) Describe the procedure of carrying out the following on an inline injection pump:
- (i) calibration;
 - (ii) phasing.
- Including the pump set-up procedure.
- (16 marks)
6. (a) State **four** precautions to observe when working on the cooling system of a car.
- (4 marks)
- (b) Describe the procedure of carrying out the following liquid cooling system tests:
- (i) pressure test;
 - (ii) thermostat test.
- In each case state the expected outcomes.
- (16 marks)
7. (a) State **three**:
- (i) causes of each of the following lubrication system faults:
 - (I) low oil pressure;
 - (II) excessive high oil pressure.
 - (ii) checks carried on an engine oil in a car.
- (9 marks)
- (b) Describe the procedure of servicing the engine lubrication system of a car. (11 marks)

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