

2503/205
ENGINE TECHNOLOGY AND
BODY WORK
Oct./Nov. 2022
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN AUTOMOTIVE ENGINEERING

MODULE II

ENGINES TECHNOLOGY AND BODY WORK

3 hours

INSTRUCTIONS TO CANDIDATES

You should have for this examination:

Answer booklet;

Drawing instruments.

This paper consists of SEVEN questions in THREE sections; A, B and C.

Answer a total of FIVE questions as follows:

Question ONE in section A is Compulsory; any TWO questions from section B and any TWO questions from section C.

All questions carry equal marks.

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

Answer ALL questions in this section (Compulsory).

1. (a) Explain the basic ingredients of paint. (6 marks)
- (b) (i) State **two** causes of the following spray painting faults:
- (I) excessive over-spray;
 - (II) gun sputters constantly.
- (ii) An accident vehicle has been brought to the workshop with a dented panel. Describe the procedure for repairing and spray painting the dented panel.

SECTION B

Answer TWO questions from this section.

2. (a) Explain **four** features used in the hybrid electric vehicles to improve fuel economy. (8 marks)
- (b) Sketch the layout of a hybrid electric vehicle and explain its operation. (12 marks)
3. (a) State **four** advantages of the petrol injection system. (4 marks)
- (b) Using a system layout, explain the operation of the D-Jetronic system used in the engine fuel system. (16 marks)
4. (a) Sketch the distributor pump assembly (DPA) fuel system and label the part. (6 marks)
- (b) With the aid of a labelled diagram, explain the operations of the hydraulic governor used in the diesel engine. (14 marks)

SECTION C

Answer TWO questions from this section.

5. Describe the procedure of carrying out the following on an engine:

- (a) dismantling;
- (b) engine measurements.
- (c) Assembly.

Assume the engine is on the work bench.

(20 marks)

6. (a) State **two** causes and **one** remedy for each of the following cooling system faults:

- (i) loss of coolant;
- (ii) engine overheats.

(4 marks)

(b) A vehicle has been brought to the workshop for servicing of the cooling system. Describe the procedure of performing the following:

- (i) checking coolant leakage;
- (ii) testing the radiator cap;
- (iii) testing the thermostat;
- (iv) servicing the radiator.

(16 marks)

7. (a) Describe the procedure of performing the compression test on an engine. (6 marks)

(b) (i) State **two** precautions to be observed when operating a turbo-charged engine.

(ii) A vehicle has a faulty turbocharger. Describe the procedure to follow when overhauling the unit.

(14 marks)

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