

2503/305
AUTO ELECTRICS AND
ELECTRONICS
Oct./Nov. 2022
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN AUTOMOTIVE ENGINEERING
MODULE III

AUTO ELECTRICS AND ELECTRONICS

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;

Drawing instruments.

This paper consists of EIGHT questions in TWO sections; A and B.

Answer FIVE questions taking at least TWO questions from each section.

All questions carry equal marks.

Candidates should answer the questions in English.

This paper consists of 4 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 at least **TWO** questions from this section.

1. (a) State two:
 - (i) positions for locating injectors in electronic fuel injection systems;
 - (ii) advantages of electronic fuel injection.

(4 marks)
- (b) With the aid of a diagram, explain the operation of an L-jetronic fuel injection system.

(16 marks)
2. (a) State two advantages and two disadvantages of electronic ignition systems.

(4 marks)
- (b) With the aid of a diagram, explain the operation of a capacitor discharge ignition system.

(16 marks)
3. With the aid of diagrams, explain the operation of:
 - (a) magnetic inductance sensor, (10 marks)
 - (b) pressure sensor. (10 marks)
4. Using a diagrams, explain the operation of:
 - (a) fuel gauge; (10 marks)
 - (b) an electric oil pressure gauge. (10 marks)

SECTION B

Answer at least **TWO** questions from this section.

5. (a) State **two** causes of a starter motor;
- (i) failing to crank when switched ON;
 - (ii) producing noise during operation.
- (4 marks)
- (b) A vehicle fitted with a faulty heavy duty starter motor has been brought into the workshop. Describe the procedure of overhauling the motor and restoring it.
- (16 marks)
6. (a) State **two** causes for an air conditioning system;
- (i) failing to cool the cabin;
 - (ii) producing noise when activated.
- (4 marks)
- (b) A vehicle with a faulty receiver dryer has been brought into the workshop. Describe the procedure of replacing the unit and restoring the vehicle air conditioning system into working condition.
- (16 marks)
7. (a) State **two** causes for each of the following charging system faults:
- (i) alternator fails to charge battery;
 - (ii) alternator noise.
- (4 marks)
- (b) Describe the procedure of overhauling an alternator. Assume the unit is on the bench.
- (16 marks)
8. Figure 1 shows an incomplete lighting circuit. Complete the circuit on the provided question paper. Cut the answer along the dotted lines and hand in with the answer booklet.
- (20 marks)