2503/305
AUTO ELECTRICS AND
ELECTRONICS
Oct. / Nov. 2021
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.

Turn over

SECTION A

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

1. (a) State **four** advantages of electronic fuel injection system. (4 marks)

   (b) With the aid of a diagram, explain the operation of the metering and fuel distribution unit of a K-jetronic fuel system. (16 marks)

2. (a) State **two**:

   (i) functions of an air conditioning system.

   (ii) types of refrigerants.

   (4 marks)

   (b) With the aid of a diagram, explain the operation of an air conditioning system of a car. (16 marks)

3. (a) With the aid of a diagram, explain the operation of a permanent magnet windscreen wiper system. (10 marks)

   (b) With the aid of a diagram, explain the operation of an electric horn. (10 marks)

4. (a) State **four** advantages of an electronic ignition system. (4 marks)

   (b) With the aid of a diagram, explain the operation of a transistor ignition system. (16 marks)

SECTION B

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

5. (a) State **two** causes for each of the following charging system faults:

   (i) charging lamp stays on;
   (ii) alternator does not charge.

   (4 marks)

   (b) A faulty alternator has been brought to the workshop for repair. Describe the procedure followed in overhauling and explain the tests carried out in each case. (16 marks)

6. (a) State **two** causes for each of the following starter motor faults:

Bad starter gear faulty starter solenoid.

(i) starter motor chatters;

(ii) no cranking. Dead battery

(4 marks)

(b) Describe the procedure of overhauling a light duty starter motor. Assume the unit is still mounted on the engine. (16 marks)

7. Complete the lighting circuit shown in **figure 1**. Cut the answer sheet along the dotted line and hand it in together with the answer booklet. (20 marks)

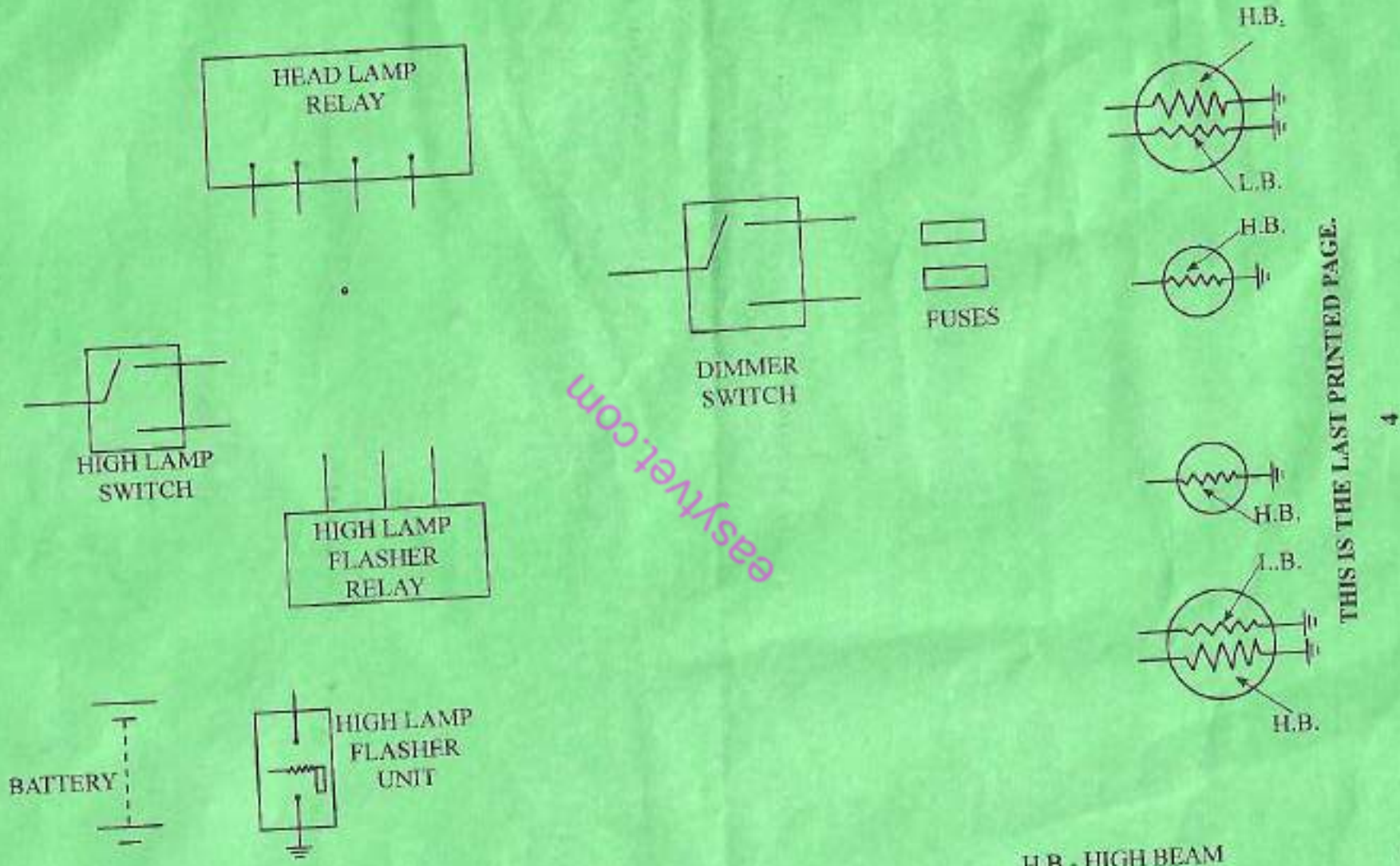
8. (a) State **two** causes for each of the following car alarm faults:

(i) alarm goes off randomly;

(ii) alarm produces noise continuously.

(4 marks)

(b) Describe the procedure of installing an alarm system in a vehicle. (16 marks)



H.B - HIGH BEAM
L.B - LOW BEAM

FIG. 1

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