

2509/305  
CONSTRUCTION PLANT TECHNOLOGY  
AND PRACTICE III  
Oct./Nov. 2022  
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL  
DIPLOMA IN MECHANICAL ENGINEERING  
(CONSTRUCTION PLANT OPTION)

MODULE III

CONSTRUCTION PLANT TECHNOLOGY AND PRACTICE III

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 TWO questions from section A, TWO questions from section B and any other ONE questions from either section.*

*All questions carry equal marks.*

*Maximum marks for each part of a question are indicated.*

*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

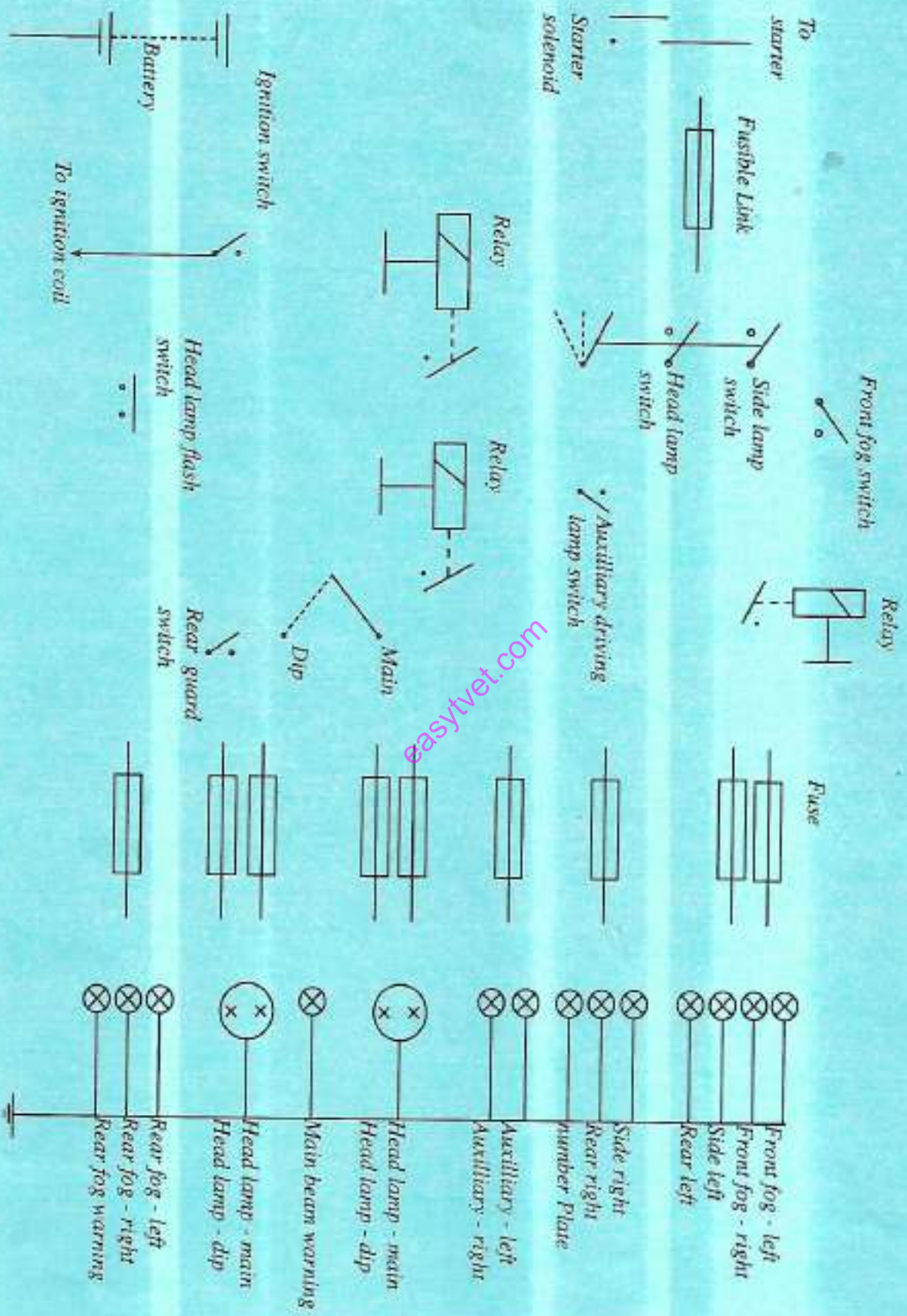
*Answer at least TWO questions from this section.*

1. (a) State **three** advantages of the electronic diesel fuel control system. (3 marks)
- (b) Using a layout diagram, explain the operation of the common rail diesel fuel system. (17 marks)
2. (a) With the aid of a sketch, explain the operation of a thermal type fuel gauge. (8 marks)
- (b) (i) Draw a labelled diagram of a vehicle air conditioning system.
- (ii) Explain the operation of the vehicle air conditioning system in (b) (i) above. (12 marks)
3. (a) Explain the principle of operation of the following mechanisms used in the electronic ignition system:
  - (i) inductive pulse generator;
  - (ii) optical pulse generator. (6 marks)
- (b) With the aid of a circuit diagram, explain the operation of the capacitor discharge ignition system. (14 marks)
4. (a) State the function of the following sensors:
  - (i) mass airflow sensor;
  - (ii) manifold absolute pressure sensor;
  - (iii) oxygen sensor. (3 marks)
- (b) With the aid of a layout diagram, explain the operation of the L-jetronic fuel injection system. (17 marks)

## SECTION B

*Answer at least TWO questions from this section.*

5. (a) Describe **two** tests carried on a battery. (4 marks)
- (b) A vehicle is brought to the workshop with a faulty alternator. Describe the procedure of overhauling the unit. (16 marks)
6. (a) State **two** possible causes of the following starter motor faults:
- (i) starter produces a grinding noise;
  - (ii) starter whines.
- (4 marks)
- (b) A heavy commercial vehicle has a faulty starter motor. Describe the procedure of overhauling the unit. (16 marks)
7. (a) State the purpose of road worthiness tests. (2 marks)
- (b) A vehicle is brought into the workshop in preparation for road worth inspection tests. Describe the preparations to be carried out on the vehicle to make its legal requirement compliant. (18 marks)
8. (a) State **two** causes for each of the following lighting system faults:
- (i) hazard warning lights blinking too rapidly;
  - (ii) brake lights inoperative.
- (4 marks)
- (b) Figure 1 shows the components of the lighting circuit. Complete the wiring circuit, cut and attach the complete figure to the answer booklet. (16 marks)



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