

2503/105
VEHICLE TECHNOLOGY AND
PRACTICE
June/July 2016
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN AUTOMOTIVE ENGINEERING
MODULE I

VEHICLE TECHNOLOGY AND PRACTICE

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Drawing instruments;

Answer booklet.

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

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

*Answer any **TWO** questions from section **A**; any **TWO** questions from section **B**; and any other **ONE** question from either section **A** or **B** in the answer booklet provided.*

All questions carry equal marks.

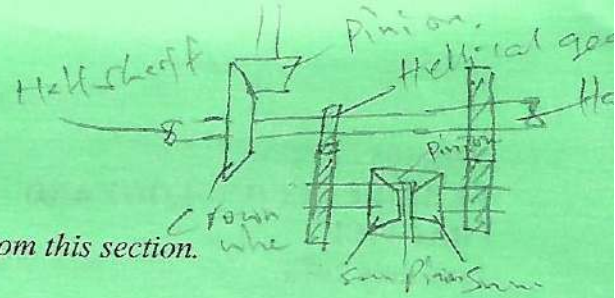
Candidates should answer the questions in English.

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

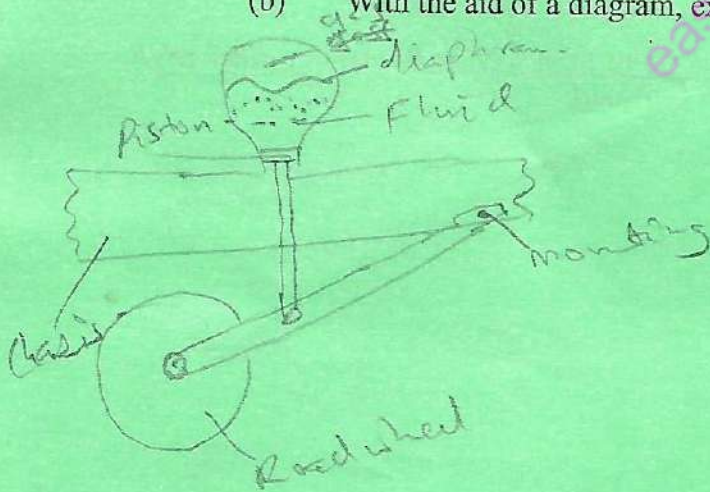


1. (a) Explain the reason behind fitting a two speed final drive unit in heavy commercial vehicles. — *Greater torque* (4 marks)
- (b) With the aid of a diagram, explain the operation of a two-speed final drive unit. (16 marks)

2. (a) State **three** advantages of hydro-pneumatic suspension systems in vehicles. (3 marks)
- (b) With the aid of a diagram, explain the operation of a hydro-pneumatic suspension unit. (17 marks)

3. (a) State **four** advantages of anti-lock braking system on a car. (4 marks)
- (b) Using a labelled diagram, explain the **four** modes of operation of an anti lock braking system. (16 marks)

4. (a) State **three** functions of a final drive assembly of a vehicle. (3 marks)
- (b) With the aid of a diagram, explain the operation of a differential unit of a car. (17 marks)



SECTION B

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

5. (a) State **two** probable causes for each of the following faults:
- (i) excessive brake pedal travel;
 - (ii) vehicle pulls to one side when braked. (4 marks)
- (b) Describe the procedure for overhauling a disc brake assembly. (16 marks)
6. (a) State **two** reasons for each of the following suspension faults:
- (i) vehicle bottoms out;
 - (ii) rough ride. (4 marks)
- (b) Describe the procedure to follow on replacing the shock absorber of a heavy commercial vehicle fitted with an air suspension system. (16 marks)
7. (a) State a probable cause for each of the following faults:
- (i) propeller shaft vibrations;
 - (ii) wear at the middle of tread pattern of a tyre;
 - (iii) wear at the inside of tread pattern of a tyre. (3 marks)
- (b) (i) A vehicle has been brought into the workshop with a faulty universal joint. Describe the procedure you would follow when replacing the joint.
- (ii) Describe the procedure followed in repairing a punctured wheel of a vehicle. (17 marks)
8. (a) For a manual gearbox, state **two** probable causes of:
- (i) gear number 4 not transmitting drive if selected;
 - (ii) noise within the gearbox. (4 marks)
- (b) Describe the procedure to follow when overhauling a synchromesh gearbox of a vehicle. (16 marks)

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