2503/105 VEHICLE TECHNOLOGY AND PRACTICE Oct/Nov. 2021 Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL DIPLOMA IN AUTOMOTIVE ENGINEERING MODULE I

VEHICLE TECHNOLOGY AND PRACTICE

3 hours

INSTRUCTIONS TO THE CANDIDATE

You should have the following for this examination:

Drawing instruments;

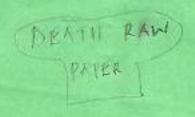
Answer booklet.

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

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

All questions carry equal marks.

Maximum marks for each part of a question are as shown. 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.

Turn over

SECTION A

Answer at least TWO questions from this section.

- 1. (a) Using sketches, explain the following types of rear axles:
 - (i) semi-floating;
 - (ii) fully-floating.

(6 marks)

- (b) With the aid of a diagram, explain the operation of a four speed constant mesh manual gearbox. (14 marks)
- (6)
- (a) State two advantages of:
 - (i) constructing a vehicle with a separate chassis;
 - (ii) mounting the engine at the front of the vehicle.

(4 marks)

- (b) With the aid of a diagram, explain the operation of a power assisted steering system. (16 marks)
- 3
- (a) State three functional requirements of a motor vehicle suspension system.
 - (ii) State three advantages of rubber springs over metal springs as used in motor vehicle suspension systems. (6 marks)
- (b) Using a diagram, explain the operation of a telescopic damper. (14 marks)
- (a) (i) Using sketches, illustrate two ways in which tyres of a rear wheel drive car can be rotated.
 - (ii) Explain three reasons for having tyres with correct tyre pressure on a motor vehicle. (7 marks)
 - (b) With the aid of a labelled diagram, explain the operation of an indirect acting power brake servo. (13 marks)

SECTION B

Answer at least TWO questions from this section.

- State three possible causes of improper suspension height on a motor vehicle.

 (3 marks)
 - (b) A car is brought into the workshop with a faulty Macpherson strut. Describe the procedure for servicing the strut. (17 marks)
- Describe the procedure for overhauling a manual gearbox. (20 marks)
- (a) Describe the procedure for balancing a car wheel. (5 marks)
 - (b) A vehicle is brought into the workshop with a faulty power steering pump. Describe the procedure of servicing the pump. (15 marks)
 - (a) State two possible causes of brake chatter. (2 marks)
 - (b) A car is brought into the workshop with ineffective disc brakes. Describe the procedure for servicing the disc brakes. (18 marks)

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