

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.

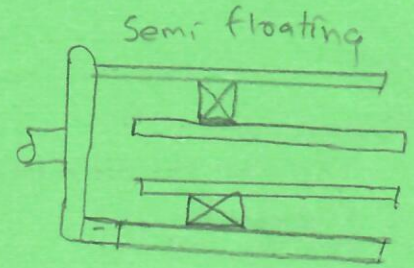
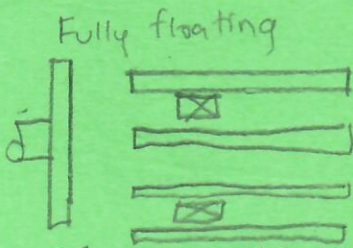
Candidates should answer the questions in English.

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.**

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)

2. (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)

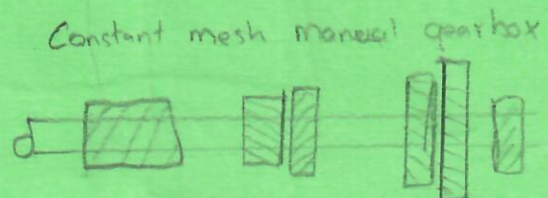
(b) With the aid of a diagram, explain the operation of a power assisted steering system. (16 marks)

3. (a) (i) 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)

4. (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.*

5. (a) 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)
6. Describe the procedure for overhauling a manual gearbox. (20 marks)
7. (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)
8. (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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