

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.*

DEATH RAW  
PAPER

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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