

2503/105
VEHICLE TECHNOLOGY AND
PRACTICE
Oct./Nov. 2022
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 drawing instruments 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) (i) State **two** safety precautions to be observed in the workshop.
(ii) State **four** classes of fire and the combustible material involved for each class. (10 marks)
- (b) (i) Illustrate the major components of a front engine rear wheel drive arrangement.
(ii) A colleague has been electrocuted while operating a machine. Explain the steps to follow in administering first aid. (10 marks)
2. (a) Explain the following steering geometry terms giving the values in each case:
(i) caster angle;
(ii) camber angle;
(iii) toe out. (9 marks)
- (b) With the aid of a diagram, explain the operation of a cam and peg steering gearbox. (11 marks)
3. (a) State **four** functions of a suspension system in a car. (4 marks)
(b) Using a labelled diagram, explain the operation of a hydrogas suspension. (16 marks)
4. (a) State **two**:
(i) gear teeth profile used in final drives;
(ii) properties of lubricants used in final drive assemblies. (4 marks)
- (b) With the aid of a diagram, explain the operation of limited slip differential. (16 marks)

SECTION B

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

5. (a) State **two** causes of:
- (i) noisy leaf springs;
 - (ii) suspension bottoming out. (4 marks)
- (b) A vehicle has been brought into the workshop with work out wishbone suspension bushes. Describe the procedure for replacing the bushes. (16 marks)

6. (a) State three causes of:
- (i) brake judder;
 - (ii) brake pedal soft and spongy. (6 marks)
- (b) A car with a faulty tandem master cylinder is brought to the workshop for repair. Describe the procedure for replacing the master cylinder. (14 marks)

7. (a) State **two** reasons for tyre bursts. (2 marks)
- (b) Describe the procedure for wheel rotation for the following types of drives fitted with radial tyre:
- (i) front wheel drive;
 - (ii) rear wheel drive. (10 marks)
- (c) Describe the procedure for carrying out wheel balancing on a wheel. Assume the wheel has been removed from the vehicle. (8 marks)

8. (a) State **two** causes of each of the following clutch faults:
- (i) clutch drag;
 - (ii) clutch spin. (4 marks)
- (b) Describe the procedure for:
- (i) determining the condition of a clutch in a vehicle;
 - (ii) replacing a diaphragm spring clutch in a light truck. (16 marks)

THIS IS THE LAST PRINTED PAGE.