

2503/105

VEHICLE TECHNOLOGY AND
PRACTICE

June/July 2020

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.

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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) State **two** safety precautions to be observed for each of the following when:
- (i) lifting heavy goods in the workshop;
 - (ii) using hand tools. (4 marks)
- (b) (i) State a material involved in Class A and D fires, and in each case name the type of fire extinguisher used.
- (ii) Illustrate the following vehicle layouts and for each case state **two** advantages:
- I. convectional vehicle layout;
 - II. rear engine rear wheel drive. (16 marks)
2. (a) Explain the following steering system terms:
- (i) under steer;
 - (ii) over steer;
 - (iii) steering axis. (4 marks)
- (b) With the aid of a diagram, explain the operation of a power assisted steering system. (16 marks)
3. (a) State **three**:
- (i) characteristics of a wheel;
 - (ii) functions of a tyre. (6 marks)
- (b) (i) State the meaning of the following inscriptions found on a tyre side wall '175/70 R 13".
- (ii) Illustrate the features of cross ply tyre construction.
- (iii) Illustrate the features of a 3-piece rim and a well base 1-piece rim constructions. (14 marks)
4. (a) State **two**:
- (i) types of metal springs;
 - (ii) advantages of air suspension system. (4 marks)
- (b) With the aid of a diagram, explain the operation of an air suspension system. (16 marks)

SECTION B

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

5. (a) State two causes of each of the following faults of the braking system:
- (i) hard brake pedal;
 - (ii) brake noise. (4 marks)
- (b) A vehicle has been brought into the workshop with a faulty disc brake. Describe the procedure of overhauling the brakes. (16 marks)
6. (a) State **two** causes of each of the following clutch faults:
- (i) clutch slip;
 - (ii) clutch grab. (4 marks)
- (b) A vehicle fitted with a diaphragm clutch is brought into the workshop. Describe the procedure of overhauling the clutch. (16 marks)
7. (a) Explain the following faults and state two possible causes of each:
- (i) steering kickback;
 - (ii) suspension bottoming out. (4 marks)
- (b) Describe the procedure of replacing a damaged McPherson strut on a vehicle. (16 marks)
8. (a) Describe the procedure of testing the condition of a torque converter clutch during a road test. (6 marks)
- (b) (i) State **four** precautions to observe when conducting a stall test on an automatic transmission of a car.
- (ii) Describe the procedure of conducting a stall test on an automatic transmission.
- (iii) Explain **four** possible outcomes of the stall test in (b)(ii) above. (14 marks)

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