

1503/105
VEHICLE TECHNOLOGY, BODYWORK
AND WORKSHOP TECHNOLOGY
June/July 2023
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
CRAFT CERTIFICATE IN MOTOR VEHICLE ENGINEERING
MODULE I

VEHICLE TECHNOLOGY, BODYWORK AND
WORKSHOP TECHNOLOGY

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;

Drawing instruments.

This paper consists of EIGHT questions in THREE sections; A, B and C.

Answer a total of FIVE questions taking at least TWO questions from section A, ONE question from section B, ONE question from section C and one other question from any sections.

Maximum marks for each part of a question are indicated.

Candidates should answer the questions in English.

This paper consists of 4 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: VEHICLE TECHNOLOGY

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

1. (a) State:
- (i) **four** advantages of auxiliary brakes.
 - (ii) **two** differences between Eddy current brakes and exhaust brakes. (5 marks)
- (b) Using a labelled diagram, explain the operation of exhaust brakes. (15 marks)
2. (a) State:
- (i) **two** functions of suspension springs in a car.
 - (ii) **four** types of metal suspension springs. (4 marks)
- (b) With the aid of a diagram, explain the operation of an air suspension system of a vehicle. (16 marks)
3. (a) State **four** classes of fires, giving an example of a material involved and a suitable fire extinguisher in each case. (8 marks)
- (b) (i) Illustrate the major components of a conventional vehicle layout.
- (ii) Explain **two** types of chassis construction.
- (iii) State **two** advantages and a disadvantage of the rear engine rear wheel drive arrangement. (12 marks)
4. (a) State **two**;
- (i) functions of a clutch in a vehicle.
 - (ii) differences between multi- plate and single plate coil spring clutches. (4 marks)
- (b) With the aid of a diagram, explain the operation of a single plate, multi- coil spring clutches. (16 marks)

SECTION B: BODY WORK

Answer at least ONE question from this section.

5. (a) (i) Illustrate **three** chassis sections;
(ii) State **three** functions of a chassis in a vehicle;
(iii) Explain **two** forces experience by the chassis in a vehicle. (8 marks)
- (b) (i) Explain the functions of body filler and spot putty in car body repair.
(ii) Describe hot shrinking as applied to panel beating and state four precautions to be observed when carrying out the process. (12 marks)
6. (a) Explain the following panel beating defects giving a means of rectifying them:
(i) Dent;
(ii) Crack
(iii) Corrosion; (6 marks)
- (b) Explain **two** methods of winding windows in a car. (4 marks)
- (c) (i) Define the term upholstery skewer and webbing stretcher. (4 marks)
(ii) State **two** types of upholstery adhesives. (6 marks)

SECTION C: WORKSHOP TECHNOLOGY

Answer at least ONE question from this section.

7. (a) Explain the following properties of engineering materials and state an example for each:
(i) brittleness;
(ii) toughness;
(iii) strength. (4 marks)
- (b) Explain the following metal finishing process citing a material used
(i) electroplating;
(ii) polishing; (4 marks)
- (c) (i) State **two** types of fluxes and the functions each flux performs.
(ii) Explain the procedure of soldering two work pieces together. (10 marks)

8. (a) (i) State **two** types of sheet metal materials.
(ii) Explain the term “edge treatment” in sheet metal and outline three methods of edge treatment. (7 marks)
- (b) (i) Explain the operations carried out on a shearing machine stating three safety precautions to be observed.
(ii) Explain **three** operations that can be carried out on a centre lathe. (13 marks)

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