

1503/105

VEHICLE TECHNOLOGY, BODYWORK
AND WORKSHOP TECHNOLOGY

Oct./Nov. 2021

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN AUTOMOTIVE ENGINEERING

MODULE I

VEHICLE TECHNOLOGY, BODYWORK AND
WORKSHOP TECHNOLOGY

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examinations:

Answer booklet;

Non-programmable scientific calculator;

Drawing instruments.

*This paper consists of **THREE** sections; A, B and C.*

*Answer a total of **FIVE** questions as follows:*

*at least **TWO** questions from Section A;*

*at least **ONE** question from Section B;*

*and at least **ONE** question from section C in the answer booklet provided.*

Maximum marks for each part of a question as shown.

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 two functions of a clutch in a vehicle. (2 marks)
- (b) Explain the meaning of propeller shaft "wind up". (2 marks)
- (c) With the aid of a sketch, explain the operation of a single plate multi-coil spring clutch. (16 marks)
2. (a) Differentiate between leading shoe and trailing shoe of a drum brake. (4 marks)
- (b) State two advantages of disc brakes over drum brakes. (2 marks)
- (c) With the aid of a sketch, explain the operation of disc brakes. (14 marks)
3. (a) State three functions of a damper in the suspension system. (3 marks)
- stability
- prevent road irregularities
- reduce upward and downward movement of vehicle
- (b) State three advantages of a hydraulic suspension. (3 marks)
- prevent wheel wobbling
- provide sup. to the spring
- provide greater % of vehicle suspension
- (c) With the aid of a sketch, explain the operation of a hydraulic suspension system. (14 marks)
4. (a) State three requirements of power steering. (3 marks)
- (b) With the aid of sketches, explain:
(i) camber angle;
(ii) castor angle. (3 marks)
- (c) With the aid of a sketch, explain the operation of worm and sector steering box. (14 marks)



SECTION B: VEHICLE BODYWORK

Answer at least ONE question in this section.

- 5.
- (a) State five safety precautions to be observed in paint work. *instructive mask rubber* (5 marks)
 - (b) Explain four reasons for painting a car. *protect car from corrosion rust high* (4 marks)
 - (c) Sketch a spray gun. (11 marks)

- 6.
- (a) State
 - (i) three upholstery materials.
 - (ii) two reasons for valenting *clean vehicle for good health - remove dust contained material inside vehicle* (5 marks)
 - (b) Sketch three chassis frame sections. (6 marks)
 - (c) With the aid of sketches, explain the following panel beating tools:
 - (i) beating file; 
 - (ii) surface spoon; 
 - (iii) curved dolly. *Making like in body* 
- (9 marks)

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SECTION C: WORKSHOP TECHNOLOGY

Answer at least ONE question in this section.

7. (a) State **three** functions of flux in soldering. (3 marks)
- (b) State **two** materials that can be arc welded. (2 marks)
- (c) With the aid of sketches, explain **three** oxy-acetylene flames. (15 marks)

8. (a) Define the following:

- (i) brittleness;
- (ii) ductility;
- (iii) hardness;
- (iv) elasticity;
- (v) malleability.

(10 marks)

- (b) With the aid of sketches, explain each of the following work holding devices on a lathe machine:

- (i) three jaw chuck;
- (ii) plain mandrel.

(10 marks)



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