Name: _____ Index No: _____/_____

1503/105
VEHICLE TECHNOLOGY, BODY WORK AND WORKSHOP TECHNOLOGY
June/July 2014
Time: 3 hours

Candidate's Signature: _____

Date: _____

THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN AUTOMOTIVE ENGINEERING

MODULE I

VEHICLE TECHNOLOGY, BODYWORK AND WORKSHOP TECHNOLOGY

3 hours

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided above.
Sign and write the date of the examination in the spaces provided above.
You should have drawing instruments for this examination.
*This paper consists of **THREE** sections; **A, B** and **C**.*
*Answer a total **FIVE** questions, taking at least **TWO** questions from Section **A**, **ONE** from section **B** and **ONE** from section **C** in the spaces provided in this question paper.*
Maximum marks for each part of a question are as shown.
Candidates should answer the questions in English.

For Examiner's Use Only

Section	Question	Maximum Score	Candidate's Score
A		20	
		20	
B		20	
C		20	
A, B or C		20	
		Total Score	

This paper consists of 16 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 terms:

   (i) camber angle;
   (ii) king pin inclination. (6 marks)

   (b) With the aid of a sketch, explain the operation of a power assisted steering system. (14 marks)

2. (a) State **four** qualities of a brake fluid. (4 marks)

   (b) With the aid of a sketch, explain the operation of an anti-lock braking system. (16 marks)

3. (a) (i) State **four** advantages of a diaphragm clutch over coil spring clutch.

   (ii) State **two** factors upon which the torque transmitted by a clutch depends. (6 marks)

   (b) With the aid of a diagram, explain the operation of a diaphragm spring clutch. (14 marks)

4. (a) State **four** stresses and their causes that a vehicle axle shaft is subjected to. (6 marks)

   (b) With the aid of a diagram, explain the operation of a limited slip differential unit. (14 marks)

SECTION B

*Answer at least **ONE** question from this section*

5. (a) Sketch a **three** dimensional view of a saloon car and show the following body parts

   (i) bonnet;
   (ii) door sill;
   (iii) quarter panel;
   (iv) cant rail;
   (v) "A" post. (8 marks)

   (b) Using sketches, describe the following chassis alignment checks;

   (i) plumb line check;
   (ii) chassis alignment;
   (iii) wheel base check. (12 marks)

6. (a) (i) State **four** qualities of upholstery materials used in vehicles.

(ii) Name any **four** upholstery materials used in public service vehicles. (6 marks)

(b) (i) Explain **three** needs for spray painting a motor car body.

(ii) Describe **three** ingredients of a motor vehicle paint. (14 marks)

SECTION C

*Answer at least **ONE** question from this section.*

7. (a) (i) State **four** sources of accidents in the automotive workshop.

(ii) State **four** classes of fire and the type of fire extinguisher used in each of the case. (8 marks)

(b) Explain **six** factors to be considered when designing a workshop layout. (12 marks)

8. (a) (i) Explain the following material properties:

I. malleability;
II. hardness.

(ii) Explain the following terms in relation to metal finishing and decorative processes:
I. polishing;
II. electroplating;
III. etching. (8 marks)

(b) With the aid of simple sketches, explain the steps involved in machining the product shown in figure 1 from a mild steel bar of diameter 80 mm and 3000 mm long. (12 marks)