

Name \_\_\_\_\_

Index No \_\_\_\_\_

1503/205

ENGINES AND AUTO ELECTRICS

June/July 2015

Time: 3 Hours

Candidate's Signature \_\_\_\_\_

Date \_\_\_\_\_



THE KENYA NATIONAL EXAMINATIONS COUNCIL

**CRAFT CERTIFICATE IN AUTOMOTIVE ENGINEERING  
MODULE II**

ENGINES AND AUTO ELECTRICS

3 Hours

**INSTRUCTIONS TO CANDIDATES***Write your name and index number in the spaces provided above.**Sign and write the date of examination in the spaces provided above.**You should have Drawing instruments for this examination.**This paper consists of TWO sections; A and B. .**Answer FIVE questions in total; taking at least TWO questions from each section in the spaces provided in this question paper.**Maximum marks for each part of a question are as indicated.**Candidates should answer the questions in English.***For Examiner's Use Only**

Section	Question	Maximum Score	Candidate's Score
A		20	
		20	
B		20	
		20	
A or B		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) State **two** types of thermostats. (2 marks)  
(b) With the aid of a sketch explain the operation of a pressure cap used in the cooling system. (18 marks)
2. (a) Sketch **three** types of valve seats. (9 marks)  
(b) With the aid of a sketch explain the construction of a poppet valve assembly. (11 marks)
3. (a) State **three** functions of oil in the engine. (3 marks)  
(b) Sketch and explain the operation of wet sump pressure lubrication system of an engine. (17 marks)
4. (a) State **four** advantages of a gas turbine engine. (4 marks)  
(b) With the aid of a sketch explain the operation of a gas turbine engine. (16 marks)

### SECTION B:

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

5. (a) State any **five** advantages of Electronic Fuel Injection (EFI) (5 marks)  
(b) Explain the functions of the following components of an electronic fuel injection system:  
(i) filter;  
(ii) pressure regulator;  
(iii) injection. (9 marks)  
(c) Explain the term "**common rail injection**" for electronic diesel fuel injection (EDI). (6 marks)
6. (a) State **four** advantages of air conditioning system in a car. (4 marks)  
(b) With the aid of a layout sketch explain the operation of air conditioning system. (16 marks)



- (a) State **three** disadvantages of an electronic ignition system. (3 marks)
- (b) With the aid of a sketch explain the operation of an electronic ignition system. (17 marks)
8. (a) Illustrate a heating and ventilation system of a vehicle. (8 marks)
- (b) State and explain the **four** main heating and ventilation controls in a vehicle. (12 marks)