

Candidate's Name: \_\_\_\_\_

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

2503/205

ENGINE TECHNOLOGY AND

BODY WORK

Oct./Nov. 2015

Time: 3 hours

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

Date: \_\_\_\_\_



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN AUTOMOTIVE ENGINEERING  
MODULE II

ENGINE TECHNOLOGY AND BODY WORK

3 hours

### INSTRUCTIONS TO CANDIDATES

*Write your name and the Index Number in the space provided above.*

*Sign and write the date of examination in the space provided above.*

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

*Answer question I in Section A (compulsory) then answer TWO questions from Section B and TWO questions from Section C in the spaces provided in this booklet.*

*All questions carry equal marks.*

*Do not remove any pages from this booklet.*

*Candidates should answer all questions in English.*

### For Examiner's Use Only

Section	Question	Maximum Score	Candidate's Score
A	1	20	
B		20	
		20	
C		20	
		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 (compulsory)

1. (a) Sketch the following body repair hand tools:
- (i) planishing hammer;
  - (ii) straight pein finishing hammer;
  - (iii) mallet. (6 marks)
- (b) Explain the following basic components of paint:
- (i) pigments;
  - (ii) thinner;
  - (iii) binder. (6 marks)
- (c) Explain the procedure of lot shrinking a stretched vehicle body panel. (8 marks)

## SECTION B

*Answer at least TWO questions from this section.*

2. (a) State any **four** advantages of a gas turbine engine. (4 marks)
- (b) With the aid of a diagram, explain the operation of a gas turbine. (16 marks)
3. (a) State **two** advantages of petrol injection over the carburettor system. (2 marks)
- (b) Define the following terms for inline fuel injection pumps:
- (i) calibration;
  - (ii) phasing. (2 marks)
- (c) With the aid of a diagram, explain the operation of a pneumatic governor of an in-line diesel injection pump. (16 marks)
4. (a) Explain **four** requirements of crankshaft bearings. (4 marks)
- (b) Explain the design feature that is incorporated in a piston and gudgeon pin assembly to reduce piston slap. (4 marks)
- (c) (i) State **two** advantages of a pressurized water cooling system.
- (ii) With the aid of a sketch, explain the water cooling system. (12 marks)



## SECTION C

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

5. (a) State **two** probable causes of the following injector faults:
- (i) distorted spray pattern;
  - (ii) incorrect opening pressure;
  - (iii) excessive leak off;
  - (iv) nozzle wetness. (8 marks)
- (b) Describe the procedure of phasing an in-line injector pump. (12 marks)
6. (a) Describe the procedure of carrying out a compression test on a spark ignition engine and interpreting the results. (10 marks)
- (b) Describe a procedure for replacing a damaged timing belt. (10 marks)
7. (a) Explain **two** implications of the following lubrication system problems:
- (i) excessive oil clearance;
  - (ii) insufficient oil clearance. (4 marks)
- (b) Explain the procedure of carrying the following tasks:
- (i) replacing crankshaft bearings;
  - (ii) measuring oil clearance using plastigage. (16 marks)