

2503/205  
ENGINE TECHNOLOGY AND  
BODYWORK  
Oct. / Nov. 2021  
Time: 3 Hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL  
DIPLOMA IN AUTOMOTIVE ENGINEERING  
MODULE II

ENGINE TECHNOLOGY AND BODYWORK

3 hours

**INSTRUCTIONS TO CANDIDATES**

You should have the following for this examination:

Answer sheet;

Drawing instruments;

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

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

Question 1 in section A is compulsory

Any **TWO** questions from section B;

Any **TWO** questions from section C.

All questions carry equal marks.

Maximum marks for each part of a question are as indicated.

Candidates should answer the questions in English.

This paper consists of 3 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

3. (a) Explain, using a labelled diagram, the operation of the bellows type thermostat used in the engine cooling system. (10 marks)
- (b) With the aid of a sketch, explain the operation of a gear type oil pump. (10 marks)
4. (a) State two advantages and two disadvantages of the rotary engine. (4 marks)
- (b) Using a labelled diagram, explain the operation of the rotary diesel (collage leaf) engine. (16 marks)

### SECTION B: ENGINE PRACTICE

*Answer at least TWO questions from this section.*

5. An engine has worn cylinder bores which require reboring. Explain the procedure for carrying out the exercise. (20 marks)
6. (a) (i) Describe a procedure to be followed when stopping a turbo charged engine. (4 marks)
- (ii) State three symptoms of worn seals of a turbocharger. (6 marks)
- (b) A vehicle has been brought to the workshop with a faulty turbocharger. Describe the procedure for overhauling the unit. (14 marks)
7. (a) State two possible causes of the following diesel engine faults:
- (i) engine idles roughly with abnormal noise and smoke;
- (ii) engine emits excessive black smoke;
- (iii) engine emits white or blue smoke. (6 marks)
- (b) A vehicle has a faulty in-line fuel injection pump. Describe the procedure of phasing and calibrating the pump. (14 marks)

**THIS IS THE LAST PRINTED PAGE**

## SECTION A- BODY WORK

*This section is compulsory.*

1. (a) (i) State two types of chassis construction. (2 marks)
- (ii) Describe the following car body parts:
- (I) roof,
  - (II) C-post,
  - (III) quarter panel,
  - (IV) front fender.
- (6 marks)
- (b) (i) Explain the functions of the following vehicle repair tools:
- (I) sand bag,
  - (II) following hammer.
- (ii) Describe the following faults on car panel paint and state one cause for each fault:
- (I) pin boiling,
  - (II) orange peel.
- (6 marks)
- (c) Describe a procedure to follow when preparing of a damaged panel ready for spray painting. (8 marks)

## SECTION B: ENGINE TECHNOLOGY

*Answer at least TWO questions from this section.*

1. (a) State two functions of a governor used in diesel engines. (2 marks)
- (b) Explain the meaning of the following terms as used in the distributor type fuel injection pump (DFA):
- (I) transfer pressure,
  - (II) metering pressure.
- (4 marks)
- (c) With the aid of a diagram, explain the operation of the hydraulic governor used in the distributor type fuel injection pump. (14 marks)