



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering & Technology

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

DIPLOMA IN AUTOMOTIVE ENGINEERING

[Institutional Based Programmes]

EAU 2302: ENGINEERING TECHNOLOGY III

END OF SEMESTER EXAMINATION

SERIES: AUGUST 2012

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*
- *Drawing Instruments*

This paper consists of **FIVE** questions in **TWO** sections **I & II**

Answer any **TWO** questions from section **I** and **ONE** question from section **II**

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

SECTION I (Answer any TWO questions from this section)

Question One (20 marks)

- a) Give **ONE** function for each of the following components of a C.I fuel supply system.
- i) Fuel tank
 - ii) Fuel lift pump
 - iii) Injector pump
 - iv) Primary filter
 - v) Main filter
- (5 marks)**
- b) (i) Give any **THREE** effects of the abrasive matters in the fuel to the engine.
(ii) Give any **TWO** limitations of water in the fuel used in motor vehicles.
- (5 marks)**
- c) With the aid of a diagram, describe the charging/intake phase of fuel into the DPA pump
- (10 marks)**

Question Two (20 marks)

- a) What do the following conditions of the exhaust system indicate on the engine?
- i) Black smoke
 - ii) Blue smoke
- (2 marks)**
- b) State **ONE** cause and **ONE** effect of the following exhaust products.
- i) Carbon
 - ii) Lead
 - iii) Carbon dioxide
- (6 marks)**
- c) Explain any **THREE** methods of reducing the production of the following exhaust gases:
- i) Carbon monoxide
 - ii) Oxides of Nitrogen
- (12 marks)**

Question Three (20 marks)

- a) State any **THREE** advantages of stir line engine
- (3 marks)**
- b) (i) Give any **TWO** disadvantages of gas turbines as compared to the conventional engines.
(ii) With the aid of a diagram describe the operation of a simple shaft gas turbine with combustion chamber.
- (17 marks)**

SECTION II (Answer any ONE question from this section)

Question Four (20 marks)

Describe the procedure for exhaust gas analysis using a 'four-gas' analyzer.

(20 marks)

Question Five (20 marks)

Describe the procedure of overhauling a turbocharger.

(20 marks)