



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

Faculty of Engineering & Technology

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

CERTIFICATE IN AUTOMOTIVE ENGINEERING

(CAE 10J)

ENGINE TECHNOLOGY

SEMESTER I EXAMINATIONS

SERIES: APRIL, 2010.

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination:

- Answer Booklet(s)
- Drawing Instruments
- Scientific Calculator

This paper consists of **TWO** Sections **A** and **B**.

Attempt **TWO** questions from Section **A** and **ONE** Question from Section **B**.

All questions carry equal marks.

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

SECTION A (THEORY)
(Answer **TWO** questions)

- Q.1 (a) Define the following terms:-
- (i) Compression ratio
 - (ii) Throw
 - (iii) Stroke
 - (iv) Engine cycle. (4 marks)
- (b) State the function of the following engine components:
- (i) Crankshaft
 - (ii) Camshaft
 - (iii) Piston
 - (iv) Valves (4 marks)
- (c) With the aid of diagrams show the construction of the following engine components:
- (i) Connecting rod
 - (ii) Cam
 - (iii) Valve (12 marks)
- Q.2 (a) With the aid of sketches describe the operation of a four-stroke, 4-cycle compression ignition engine. (14 marks)
- (b) Given the cylinder bore as 105mm and stroke 85mm with 4 cylinders, calculate:-
- (i) Swept volume
 - (ii) Clearance volume, given the compression ratio as 5.5:1 (6 marks)
- Q.3 (a) State the function of a carburetor. (2 marks)
- (b) With the aid of a diagram describe the construction and operation of a simple carburetor. (13 marks)
- (c) State **THREE** methods used to construct fuel tanks. (3 marks)
- (d) Give the main reason why fuel tanks are divided into compartments.

(2 marks)

SECTION B (PRACTICE)

(Attempt **ONE** question.)

- Q.4 (a) List **TWELVE** safety precautions to be observed in a motor vehicle workshop. (6 marks)
- (b) A vehicle engine has been dismantled in the workshop. Describe the procedure to:-
- (i) Test and attach the cylinder head to the block
 - (ii) Adjust valve clearance. (14 marks)
- Q.5 Describe the procedure to dismantle, examine and assemble a 4-cylinder S.I. engine. (20 marks)