



**UNIVERSITI KUALA LUMPUR
Malaysia France Institute**

**FINAL EXAMINATION
SEPTEMBER 2014 SESSION**

SUBJECT CODE : FVB30203

SUBJECT TITLE : ENGINE MANAGEMENT AND CONTROL
TECHNOLOGY 2

LEVEL : BACHELOR

TIME / DURATION : 9.00 AM – 12.00 PM
(3 HOURS)

DATE : 10 JANUARY 2015

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
 2. This question paper is printed on both sides of the paper.
 3. Please write your answers on the answer booklet provided.
 4. Answer should be written in blue or black ink except for sketching, graphic and illustration.
 5. This question paper consists of TWO (2) sections. Section A and B. Answer all questions in Section A. For Section B, answer three (3) question only.
 6. Answer all questions in English.
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THERE ARE 4 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 40 marks)**INSTRUCTION: Answer ALL questions.****Please use the answer booklet provided.****Question 1**

- (i) State the **FIVE (5)** calibration works that could be performed by a technician during Vehicle Calibration process. (5 marks)
- (ii) There are **TWO (2)** types of Engine Management System. List them and explain in detail their features. Give the **THREE (3)** examples of the brands of each system. (15 marks)

Question 2

- (i) The primary setting for engine is injection and ignition timing. Construct a table for injection and ignition timing phase for 6-cylinder 4-stroke cycle engine. (5 marks)
- (ii) Discuss in detail the **FOUR (4)** factors that will limit the engine performance. Give a suggestion how to overcome the limitation. (15 marks)

SECTION B (Total: 60 marks)**INSTRUCTION: Answer only THREE questions.****Please use the answer booklet provided.****Question 5**

You are given a vehicle Proton Persona CamPro engine to be tuned using a MOTEC system. You are required to develop a calibration procedure using a MOTEC software system. Your calibration procedure for spark and fuel calibration for part load and full load should include the following items:

- i. Part Load Ignition angle Map
- ii. Part Load Fuel Injection Map
- iii. Part Load Ignition and Fuel Calibration procedure for Maximum spark advance for Maximum Best Torque (MBT)
- iv. Full Load Ignition and Fuel Calibration procedure for fuel saving
- v. Full Load Ignition and Fuel Calibration procedure for performance.

(20 marks)

Question 6

You are given a vehicle Proton Persona CamPro engine to be tuned by using a MOTEC system. You are required to draw and rewire a complete wiring diagram based on the PROTON Persona 1.6L that uses MOTEC ECU.

- i. State all sensor connection points and terminations.
- ii. State the name and type of the sensors.
- iii. State all actuator connection points and terminations.
- iv. State the names and types of all actuators.

(20 marks)

Question 7

You are given a vehicle Proton Persona CamPro engine to be tuned by using a MOTEC system. You are required;

- a. to illustrate and state the starting system layout and name all the connections. point.
- b. to illustrate and state the ignition system layout and name all the connections. point.
- c. to illustrate and state the fuel pump system layout and name all the connection points.

(20 marks)

Question 8

You are given a vehicle Proton Persona CamPro engine to be tuned by using a MOTEC system. You are required to develop a calibration procedure using a MOTEC software system. Illustrate a calibration procedure chart. Prior to calibration process, you are required to explain the following input checks;

- i. Engine parameters.
- ii. Crank and cam synchronization.
- iii. Throttle Position Angle Sensor.
- iv. MAP sensor calibration.

(20 marks)

END OF QUESTION