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CONFIDENTIAL

SET A

UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION

JANUARY 2014 SESSION

SUBJECT CODE	:	**FVB 30203**
SUBJECT TITLE	:	**ENGINE MANAGEMENT AND CONTROL TECHNOLOGY 2**
LEVEL	:	**BACHELOR**
TIME / DURATION	:	**(3 HOURS)**
DATE	:	

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 inEnglish.**

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

List down **FIVE (5)** works performed by the engineers during Base Engine Calibration.

(5 marks)

Question 2

The architectures of Electronic Control Unit (ECU) consist of 16-bit load based and 32-bit torque based. Explain in details with a sketch the metering system used in 32-bit load based ECU.

(5 marks)

Question 3

Draw a table for injection and ignition timing phase for 6-cylinder 4-stroke cycle engine.

(5 marks)

Question 4

By referring on the Mapping Flow **(Figure 1)**, discuss in details the process on how the Electronic Control Unit (ECU) produces a spark and inject a fuel to the engine.

(15 marks)

Question 5

List down **FIVE (5)** factors that will limit the engine performance.

I. Discuss in details only **TWO (2)** from your answer.

(10 marks)

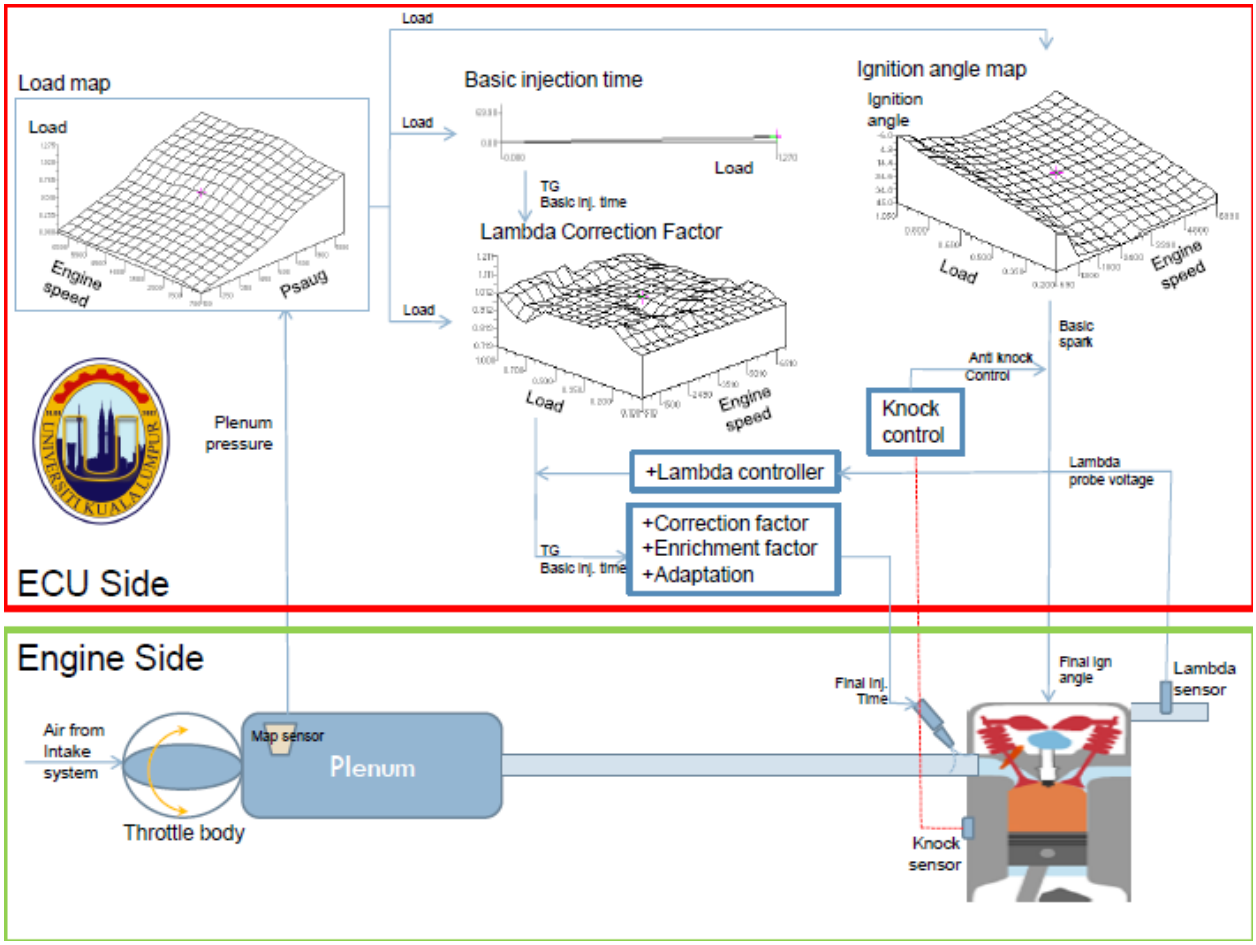

Figure 1 : Mapping Flow

SECTION B (Total: 60 marks)

INSTRUCTION: Answer only THREE questions.
Please use the answer booklet provided.

Question 6

You are given a vehicle proton persona CamPro IAFM wiring diagram to be tuned by using a MOTEC system. You are required

a. To list down all sensors available in the vehicle.
b. To draw and rewiring all the sensor wiring diagram based on the PROTON persona 1.6 l that use MOTEC ECU.
    i. State all sensor connection point and termination.
    ii. State the name of the sensors.

(20 marks)

Question 7

You are given a vehicle proton persona CamPro IAFM wiring diagram to be tuned by using a MOTEC system. You are required

a. To list down all actuator available on the vehicle.
b. To draw and rewiring all the actuator wiring diagram based on the PROTON persona 1.6 l that use MOTEC ECU.
    iii. State all sensor connection point and termination.
    iv. State the name of the sensors.

(20 marks)

Question 8

You are given a vehicle proton persona CamPro IAFM wiring diagram to be tuned by using a MOTEC system. You are required

a. To list down all sensor and actuator available on the vehicle.
b. To draw the power line of:
    1. 12 volt system
    2. 8 volt system
    3. 5 volt system
c. To draw and state the starting system layout and name all the connection points.
d. To draw and state the ignition system layout and name all the connection points.

e. To draw and state the fuel pump system layout and name all the connection points.

(20 marks)

Question 9

You are given a vehicle proton persona CamPro IAFM to be tuned by using a MOTEC system. You are required to develop a calibration procedure by using a MOTEC software system. Your calibration procedure should include the following items:

a. ECU input and output checks
   i. Engine parameters
   ii. Crank and cam synchronization
   iii. Sensor calibration:
      a. Throttle Position Angle
      b. MAP sensor calibration
      c. Air temp sensor
      d. Engine temp

(20 marks)

END OF QUESTION