



**UNIVERSITI KUALA LUMPUR
Malaysia France Institute**

**FINAL EXAMINATION
JANUARY 2014 SESSION**

SUBJECT CODE : FVD 23104
SUBJECT TITLE : ENGINE MANAGEMENT SYSTEM
LEVEL : DIPLOMA
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 **ONE** side 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 **TWO (2)** questions only.
 6. Answer all questions in English.
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THERE ARE 3 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

INSTRUCTION: Answer ALL questions.

Question 1

Explain on ignition timing theory based on Figure 1. Then draw a figure of relative output torque as a function of spark advance.

(10 marks)

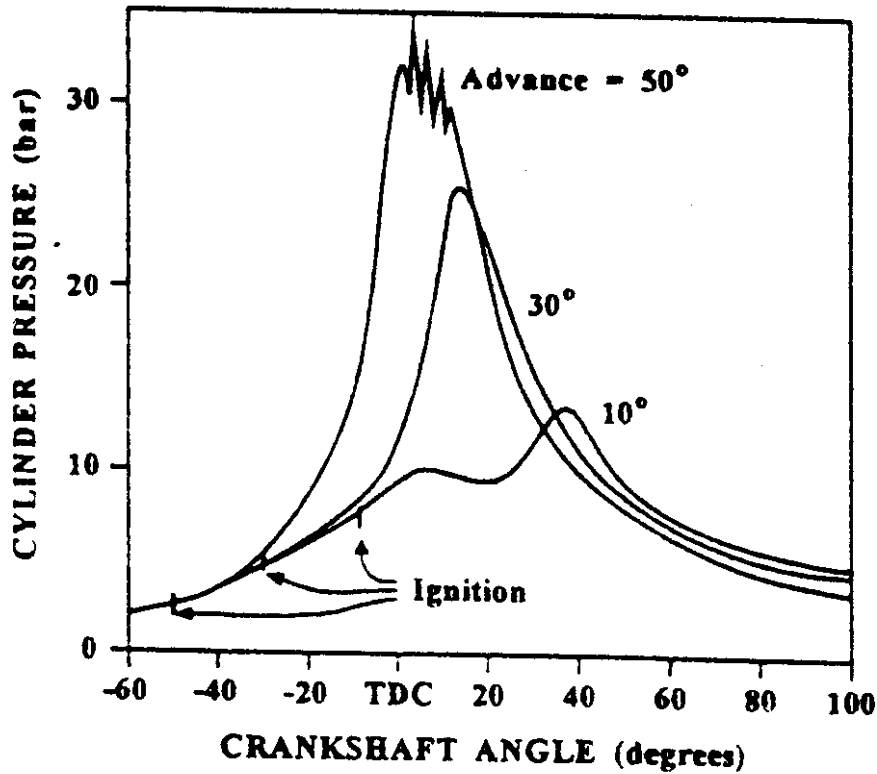


Figure 1: Cylinder pressure as a function of crankshaft angle in a typical engine.

Question 2

List **FIVE (5)** major types of sensors used to gather inputs on a computerized engine control system.

(5 marks)

Question 3

Explain **FIVE (5)** factors that influence the speed of flame propagation.

(5 marks)

Question 4

Explain in detail the stated **THREE (3)** correction coefficients following which obtained from extensive tests performed during engine development work.

- a. After start Enrichment.
- b. Warm up enrichment.
- c. Battery voltage Correction.

(9 marks)

Question 5

Explain in detail the **THREE (3)** types of Air Flow Sensor.

(9 marks)

Question 6

Airflow EFI is more costly and complicated than speed-density EFI but offers several advantages. List down **THREE (3)** of its advantages.

(6 marks)

Question 7

Explain in detail **THREE (3)** common types of actuator that are used in engine management and control system.

(6 marks)

Question 8

Based on the figure 2 below, explain the operation of EGR Valve Position (EVP) sensor.

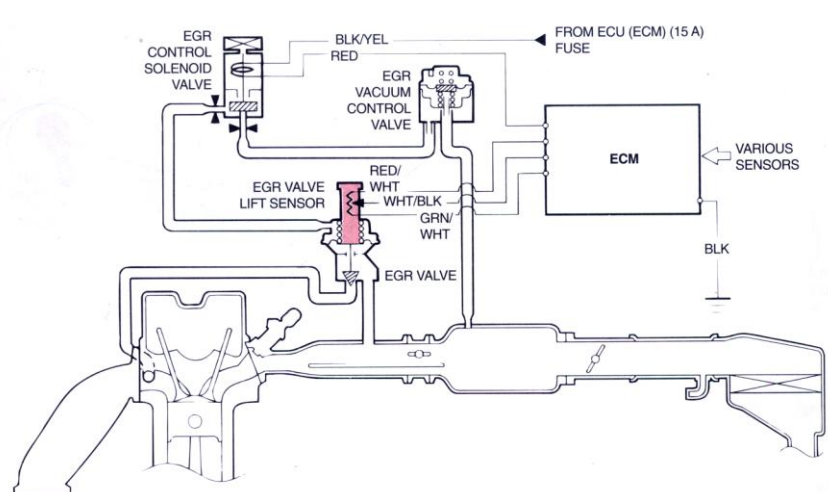


Figure 2: The EGR position sensor, also called an EVP sensor, is located on the top of the EGR valve.

(10 marks)

SECTION B (Total: 40 marks)**INSTRUCTION: Answer ONLY TWO (2) questions in this section.****Question 1**List down and explain **FIVE (5)** factors which influence the speed of flame propagation.

(20 marks)

Question 2

Describe the "Speed Density EFI" and "Mass Air-Flow EFI".

(20 marks)

Question 3

Draw a diagram and explain the operation of fuel pressure regulator in condition of:

- i. Idling
- ii. Wide Open Throttle (W.O.T)

(20 marks)

END OF QUESTION