



**UNIVERSITI KUALA LUMPUR
Malaysia France Institute**

**FINAL EXAMINATION
SEPTEMBER 2014 SESSION**

SUBJECT CODE : FVD12603
SUBJECT TITLE : ENGINE TECHNOLOGY
LEVEL : DIPLOMA
TIME / DURATION : 2.00 PM – 4.30 PM
(2.5 HOURS)
DATE : 5 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 two (2) questions only.
 6. Answer all questions in English.
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THERE ARE 4 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)**INSTRUCTION: Answer ALL questions.****ANSWER ALL THE QUESTION****Question 1**

- a) Define work, energy and torque and relate them to automotive. (3 marks)
- b) Define the thermal efficiency and where does the thermal lost go. (3 marks)
- c) State the difference between a bend connecting rod and a twisted connecting rod. (4 marks)

Question 2

- a) State the advantages of variable timing camshaft over conventioneer system. (4 marks)
- b) Describe the abnormal engine noise (**pre-ignition and detonation**) and ways to eliminate it. (6 marks)

Question 3

- a) Sketch a diagram to show the lay-out of a diesel **fuel system** and show the high pressure area. (4 marks)
- b) Explain the purposes of **glow plug** and how it works. (4 marks)
- c) Name **TWO (2)** types of fuel injection pumps. (2 marks)

Question 4

- a) Calculate the engine displacement for square engine with 8 cm bore and V4 engine. (4 marks)
- b) Explain the procedure to perform engine compression test and reason to perform twice dry and wet. (6 marks)

Question 5

- a) Explain the importance of removing the blow-by gas from engine (crankcase). (5 marks)
- b) Describe the draft tube operation and the effects to environment. (5 marks)

Question 6

- a) Explain two advantages of force induction engine over natural aspirated engine. (4 marks)
- b) Explain what turbo-lag is and give solution to reduce it. (4 marks)
- c) Describe parasite load. (2 marks)

SECTION B (Total: 40 marks)

INSTRUCTION: Answer TWO (2) questions only.

Question 1

a) Customer wants to replace his cylinder head after having engine overheat. As a technician give your advice about this matter if the engine detail are bore (8.4 cm), stroke (9.3cm), gasket thickness (2.5mm) and old cylinder head (53 cc) and new cylinder head (41cc). Calculate the compression ratio and explain.

(15 marks)

b) Define the problem and give a solution of the engine regarding to compression test result as below:

Table 1: Compression test table

| Cylinder | 1 | 2 | 3 | 4 |
|----------|-----|-----|-----|-----|
| Dry | 120 | 120 | 125 | 125 |
| Wet | 160 | 160 | 165 | 165 |

(5 marks)

Question 2

a) Customer complained he was having engine jerking especially during overtaking.

The jerking occurred especially during fast acceleration. The ignition system is has no problem at all and the car used carburetor. From the statement, identify and explain the possible causes and the solutions to tackle it.

(15marks)

b) Define the problem and give a solution to the engine regarding to compression test resulted as below:

(5 marks)

Table 2: Compression test table

| Cylinder | 1 | 2 | 3 | 4 |
|----------|-----|----|-----|-----|
| Dry | 150 | 30 | 145 | 145 |
| Wet | 170 | 30 | 165 | 165 |

Question 3

Give your advice for customer to choose either to increase engine displacement by re-bore the cylinder or by changing the stroke. Explain the advantages of each choice and show the calculation before and after re-building. Assume that your engine is square (bore and stroke are the same).

(20 marks)

END OF QUESTION