Document No : UniKL MFI_SD_AC41
Revision No: 02
Effective Date: 01 December 2008

CONFIDENTIAL

SET A

UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION

JANUARY 2011 SESSION

SUBJECT CODE	:	**FVB 30703**
SUBJECT TITLE	:	**ALTERNATIVE FUEL VEHICLE**
LEVEL	:	**BACHELOR**
TIME / DURATION	:	**9.00 am – 11.00 pm (2 HOURS)**
DATE	:	**08 MAY 2011**

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) question only.
6. Answer all questions in English.

THERE ARE 4 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

INSTRUCTION: Answer all the question.
Please use the answer booklet provided.

Question 1

a) List five advantages of using CNG as a transportation fuel compared to Liquefied Petroleum Gas(LPG). (5 marks)

b) State FIVE information which is displayed on the cylinder. (5 marks)

c) Why is the Compressed Natural Gas need to be odorized? (2 marks)

Question 2

(a) The CNG fuel control equipment includes all the necessary components' to convert CNG at high pressure to the CNG air mixture for supply to the engine. List down EIGHT CNG fuel control equipments. (8 marks)

(b) Explain the function of any **FIVE** of the components above. (5 marks)

(c) State **FIVE** considerations to be taken when installing the regulator. (2 marks)

Question 3

(a) Explain how does the safety feature works if the gas pressure in the NGV cylinder increases more than the predetermined safe level. (3 marks)

(b) As a qualified installer, how would you determine that the position of the NGV Filler Valve is in compliant with the MS:1096 – 2011 Standard. (8 marks)

Question 4

a) Explain the importance of having a post-conversion check on the vehicles that have been installed with NGV equipment. (6 marks)

b) Give **THREE** (3) probable causes of each of the following phenomena:

i. Engine can be started on NGV, but not on Petrol

ii. Engine runs on petrol but dies when switched to NGV

iii. Engine runs on CNG but hesitates on acceleration

(9 marks)

(c) List **FOUR** factors need to be considered in determining the location of NGV Cylinder.

(8 marks)

SECTION B (Total: 40 marks)

INSTRUCTION: Answer TWO (2) questions only.
Please use the answer booklet provided.

Question 5

(a) With an aid of a diagram, explain how would you connect the change-over-switch to the respective NGV components so that the switch function as required.

(10 marks)

(b) Explain the function of the following components:

i. Manometer
ii. High pressure relief device
iii. Loops on the high pressure pipe
iv. Emergency cork fitted on petrol solenoid valve

(8 marks)

(c) Explain why does the NGV cylinder need to be retested after one or two years of usage? (2 marks)

Question 6

(a) Name **TWO** characteristics of NGV that cause a loss of engine's power when it is used in a bi-fuel vehicle and explain the reasons. (10 marks)

(b) List down **FOUR** test procedures for leak testing of the NGV system.

(6 marks)

(c) Give two reasons why the ignition timing of a bi-fuel (NGV and Gasoline) has to be set more advanced than the original setting. (4 marks)

Question 7

(a) Give **THREE** characteristics of NGV that make it a safer fuel than Gasoline.

(3 marks)

(b) Explain how does each of the characteristics mentioned in (a) contributes to the NGV as a safer fuel than Gasoline. (9 marks)

(c) Explain clearly why in a bi-fuel (NGV and Gasoline) vehicle the spark plugs are prone to fouling, pre-ignition and valve-burning whenever NGV is subjected to a prolonged heavy duty use? (8 marks)

END OF QUESTION