



**UNIVERSITI KUALA LUMPUR  
Malaysia France Institute**

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**FINAL EXAMINATION  
JANUARY 2014 SESSION**

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**SUBJECT CODE : FVB 30803**  
**SUBJECT TITLE : ALTERNATIVE FUEL VEHICLE**  
**LEVEL : BACHELOR**  
**TIME / DURATION : 2.5 HOURS 9.00 am - 11.30 am**  
**DATE : 28 MAY 2014**

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**INSTRUCTIONS TO CANDIDATES**

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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.
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**THERE ARE 4 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.**

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**SECTION A (Total: 60 marks)**

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

**Question 1**

- a) List **FIVE (5)** advantages of using Compressed Natural Gas (CNG) as a transportation fuel compared to Liquefied Petroleum Gas (LPG). (5 marks)
- b) State **FIVE (5)** information which must be displayed on the cylinder gas. (5 marks)
- c) What are the characteristic of the Compressed Natural Gas and does it 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 (8)** CNG fuel control equipments. (8 marks)
- (b) Explain the function of any **FIVE (5)**of the components above. (5 marks)
- (c) State **FIVE (5)** 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 (4)** 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) What does it mean for Hybrid Electric Vehicle? (2 marks)
- (b) List **FOUR (4)** common features of Most Hybrids Electric Vehicle that improve fuel economy. (8 marks)
- (c) List down **THREE (3)** unique characteristics that the driver may or may not notice while driving Hybrid Electric Vehicle. (6 marks)
- (d) Explain the Series Hybrid design system of the Hybrid Vehicle. (4 marks)

**Question 6**

- (a) Name **TWO (2)** 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 (4)** test procedures for leak testing of the NGV system. (6 marks)
- (c) Give **TWO (2)** 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 (3)** 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**