



UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION
JANUARY 2011 SESSION

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| SUBJECT CODE | : | FVB 20603 |
| SUBJECT TITLE | : | AUTO AIR CONDITIONING AND CLIMATE CONTROL SYSTEM |
| LEVEL | : | BACHELOR |
| TIME / DURATION | : | 3.30pm – 6.00pm (2 ½ HOURS) |
| DATE | : | 09 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) questions only.
6. Answer all questions in English.

THERE ARE 4 PAGES OF QUESTIONS AND 1 PAGE OF APPENDIX, EXCLUDING THIS PAGE.

SECTION A (Total: 40 marks)**INSTRUCTION: Answer all the question.****Please use the answer booklet provided.****Question 1**

- a) State the **FOUR** (4) main purpose of the air conditioning system in order to maintain a comfortable environment inside the vehicle.
(5 marks)
- b) States the difference between the conventional and a climatic control automotive air-conditioning system.
(5 marks)

Question 2

Sketch the main components of a car air-conditioning system by showing the:

- (i) name and refrigerant flow direction
- (ii) low and high side of the system
- (iii) the condition of the refrigerant in the system.
- (iv) the heat transfer process

(10 marks)

Question 3

- a) How to determine the correct amount of refrigerant in the vehicle air-conditioning system?
(3 marks)
- b) Explain the characteristics of the refrigerant used in air conditioning systems.
(3 marks)
- c) Discuss the effect of refrigerant to the environment and damage to the ozone layer and its danger to living things
(4 marks)

Question 4

- a) State the uses and the differences of a filter drier and an accumulator.
(3 marks)
- b) When is the most suitable time to replace the filter drier?
(2 marks)
- c) Sketch the working principle of a filter drier and an accumulator.
(5 marks)

SECTION B (60 marks)**INSTRUCTION:** Answer any **TWO** (2) questions only**Question 1**

- a) What are the uses of a Mollier Diagram in an air-conditioning system?
(5 marks)
- b) From the given R-134a Mollier Chart (attachment 1), you are required to plot the refrigeration cycle based on the data taken from a car air-conditioning system as follow:
- (i) Low Pressure = 3 bar
 - (ii) Temp. at high side = 40 C
 - (iii) Temp. at TXV = -2 C
 - (iv) Pressure entering Compressor = 6.1 bar
- (10 marks)
- c) From the chart determine the following values:
- (i) Refrigerating Effect
 - (ii) Compression work
 - (iii) Condenser work
 - (iv) Coefficient of Performance
- (10 marks)
- a) What can you conclude about the system?
(5 marks)

Question 2

Explain the process of servicing a car air-conditioning system which includes:

- (i) the safety procedures
(5 marks)
- (ii) all the required tools and equipments
(5 marks)
- (iii) the cleaning process
(5 marks)
- (iv) the charging process

(15 marks)

Question 3

A Customer complaint that her CLIMATIC car air conditioning system is not functioning as usual. After making a check you found that the air flow is not consistent and the gauge reading is abnormal. As an air-conditioning expert and as a service advisor how would you explain the follows?

a) condition and possible causes of the air-conditioning system.

(7 marks)

b) the functions and the required components to be changed.

(8 marks)

c) the detail works, processes and time taken to perform the repair.

(15 marks)

END OF QUESTION

Attachment 1

Mollier Diagram for R134a

