UNIVERSITY KUALA LUMPUR  
Malaysia France Institute  

FINAL EXAMINATION  
JANUARY 2010 SESSION  

SUBJECT CODE : FCB 20703  
SUBJECT TITLE : STUDY OF AIR CONDITIONING EQUIPMENT AND SYSTEMS  
LEVEL : BACHELOR  
TIME / DURATION : 9.00am – 12.00pm  
( 3 HOURS )  
DATE : 29 APRIL 2010  

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 questions paper consists of THREE (3) questions. Answer ALL questions.  
6. Answer ALL questions in English.  

THERE ARE 4 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.
INSTRUCTION: Answer ALL questions.
Please use the answer booklet provided.

Question 1
Schematic of a direct fired LiBr/H₂O absorption system is given in Figure Q1.

(a) Name the components marked from 1 until 15. Each correct answer is awarded two (2) marks.

(b) Estimate the pressures in the two shells, given that the unit is used for air conditioning application (chilled water range: 7°C/13°C and cooling tower range: 29°C/35°C).

(5 marks)
Figure Q1 Schematic of Direct Fired LiBr/H$_2$O Absorption System
Question 2.

An Air Handling Unit (AHU) employing chilled water cooling has the following specification:
(a) indoor design condition: 24 °C DB, 60 % RH
(b) outdoor condition: 32 °C DB, 80 % RH
(c) fresh air intake = 10% of supply air
(d) average temperature of cooling coil = 10.5 °C DB
(e) supply air temperature = 14 °C
(f) assume specific heat capacity for dry air at 14 °C = 1.02 kJ/kg K
(g) assume specific volume of dry air at room condition = 0.85 m³/kg
(h) room sensible cooling load = 110 Kw

Employing the Psychrometric chart provided,

a) plot the air conditioning process on the psychrometric chart (20 marks)

b) calculate the supply air volume delivered to space in m³/s. (15 marks)
Question 3

Figure Q3  Air conditioning System for Office Building.

a) Name two (2) types of occupancies in any buildings and provide suitable examples. (5 Marks)

b) You are working as a consulting engineer in an established consulting firm. Your client asked for a design criteria for air conditioning system for a high rise hotel. Give an example of a complete design criteria. (5 Marks)

c) As a designer, what type of air conditioning system could you choose for a three-storey multi-tenant shop lots which require a cooling system? Explain why? (10 Marks)

d) Name the type of air distribution system used in Figure Q3. (10 Marks)

END OF QUESTIONS

* FCB 20703 – STUDY OF AIR CONDITIONING EQUIPMENT AND SYSTEMS
APPENDIX
Figure C1.2 CIBSE psychrometric chart (-10 to +60 °C) (CIBSE Guide C includes charts for temperature ranges -10 to +60 °C and +10 to 110 °C)