



**UNIVERSITI KUALA LUMPUR
Malaysia France Institute**

**FINAL EXAMINATION
SEPTEMBER 2014 SESSION**

SUBJECT CODE	:	FCD30103
SUBJECT TITLE	:	RAC SYSTEM STUDIES
LEVEL	:	DIPLOMA
TIME / DURATION	:	3.00 PM – 5.30 PM (2.5 HOURS)
DATE	:	2 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. Answer all questions in English.

THERE ARE 5 PRINTED PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

**INSTRUCTION: Answer ALL questions.
Please use the answer booklet provided.**

Question 1

(a) List down and explain four (4) basic categories of Air Conditioning System
(12 marks)

(b) Sketch and label all the elements of Dual Duct System arrangement with Air Handling Unit (AHU).
(8 marks)

Question 2

(a) Describe with sketch all the elements of Air Water System.

(10 marks)

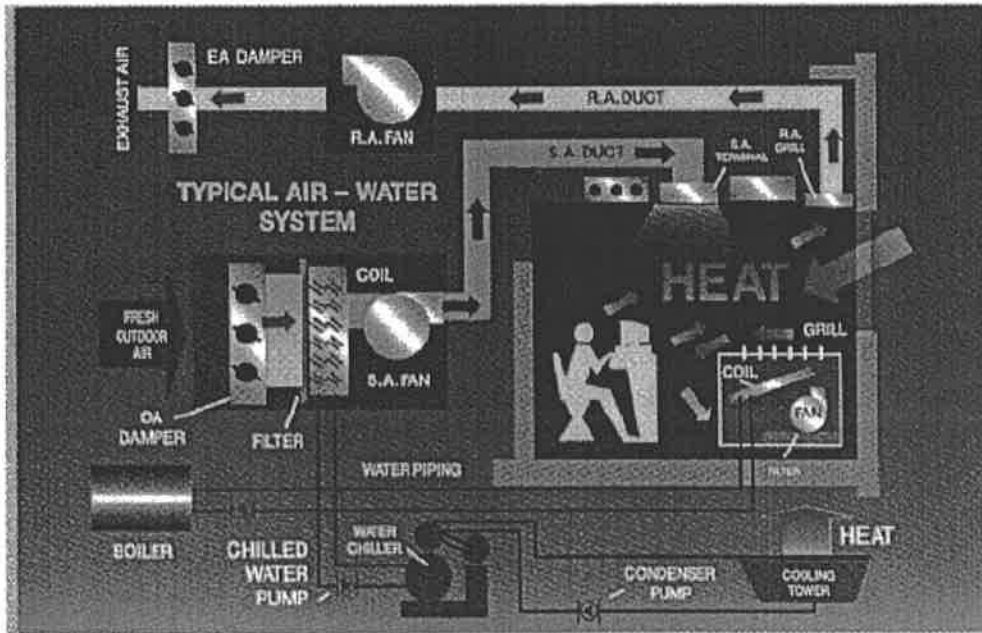


Figure Q2 (a) : Air-water System

(b) Describe clearly regarding Thermal Storage System.

(10 marks)

Question 3

- (a) In a high rise or a large scale building, there is a system used to control and monitor the air conditioning central system. What do you call the system?

(6 marks)

- (b) You are working as a maintenance engineer in an intelligent building in Kuala Lumpur. To sustain good internal air quality in the building, you must ensure that your pre-filter and secondary air filter needs to be changed immediately when required. Give two (2) methods to solve dirty filters problem and describe them briefly.

(8 marks)

- (c) Explain the characteristic of Concentrated Solution, Dilute Solution and Intermediate Solution in Absorption Chiller system.

(6 marks)

SECTION B (Total: 40 marks)**INSTRUCTION: Answer only TWO questions.****Please use the answer booklet provided.****Question 4**

You are given :

- (a) For the operation of cooling coil:
- indoor design condition : 24 °C DB, 50 % RH
 - outdoor condition : 33 °C DB, 80 % RH
 - fresh air intake = 30% of supply air
 - average temperature of cooling coil = 10.5 °C DB
 - supply air temperature = 14 °C
 - assume specific heat capacity for dry air at 14 °C = 1.02 kJ/kg K
 - assume specific volume of dry air at room condition = 0.85 m³/kg
 - room sensible cooling load = 300 kW
- (b) Psychrometric chart (Appendix 1).

It is required

- That the cycle of air is correctly plotted in the psychrometric chart.
- That the calculations are correct.

(a) To plot the air conditioning process on the psychrometric chart (Appendix 1)
(10 marks)

(b) To calculate the supply air volume delivered to space in m³/s.
(10 marks)

Question 5

(a) As HVAC&R design engineer, what type of air conditioning system you choose for a fifty-storey office building which requires cooling system? Explain why you chose that type of system?

(10 marks)

(b) List five (5) air qualities which a total air conditioning system controls.

(10 marks)

Question 6

(a) Draw the four (4) basic components of a refrigeration cycle connected by refrigeration piping. Label each component and refrigeration line. Put arrows on the refrigeration lines to show the direction of flow in the system.

(10 marks)

(b) What are the five (5) types of compressor?

(10 marks)

END OF QUESTION

APPENDIX 1

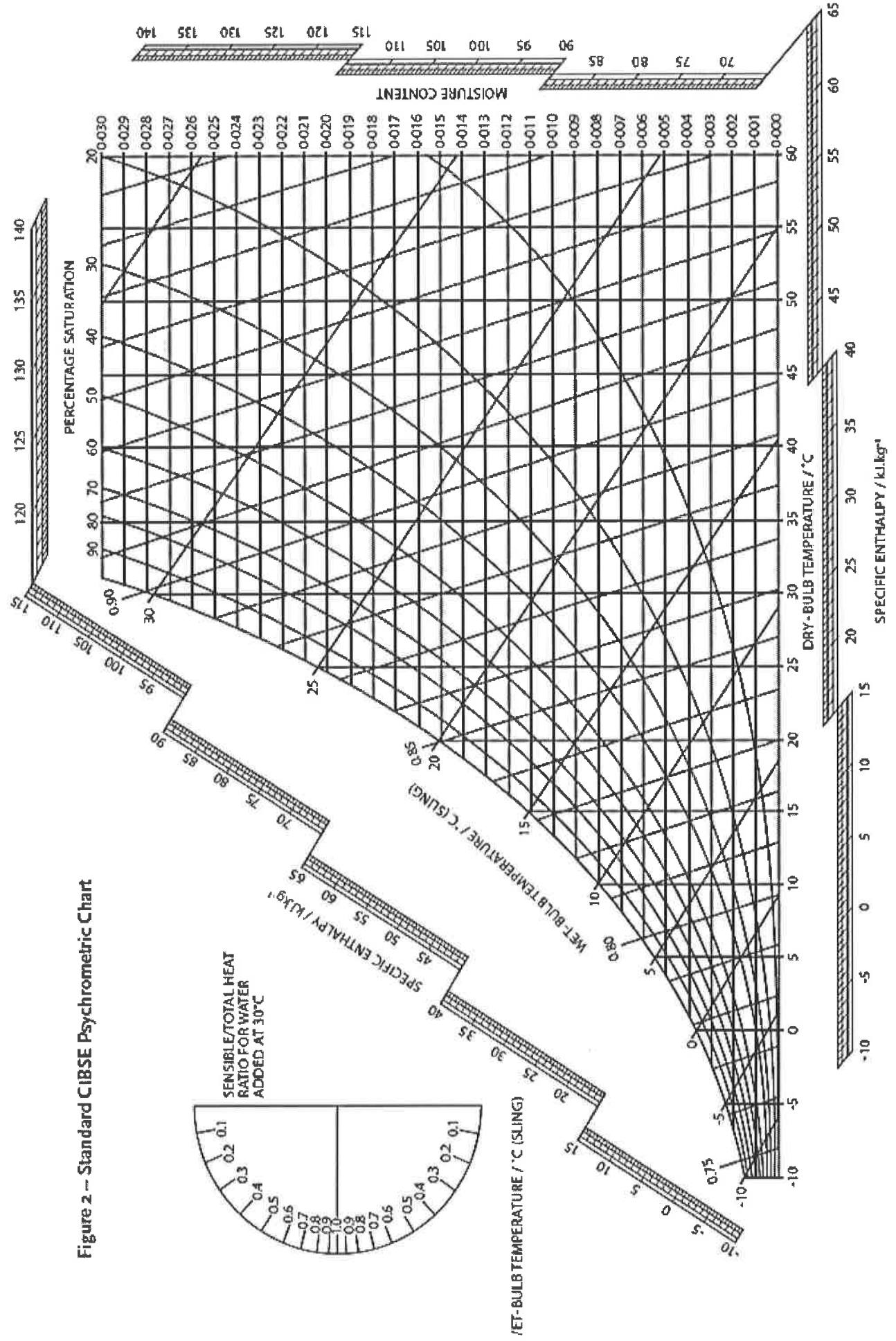


Figure 2 -- Standard CIBSE Psychrometric Chart