



**UNIVERSITI KUALA LUMPUR
Malaysia France Institute**

**FINAL EXAMINATION
JANUARY 2014 SESSION**

SUBJECT CODE : FRD 20602
SUBJECT TITLE : THERMAL STORAGE
LEVEL : DIPLOMA
TIME / DURATION : (2 HOURS) 9.00 am - 11.00 am
DATE : 06 JUN 2014

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.
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THERE ARE 3 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

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

Question 1

- (a) Describe in detail the definition of Thermal Storage System. (10 marks)
- (b) Give five (5) types of Thermal Storage System. (5 marks)
- (c) Explain clearly the listed system below which must consist in Thermal Storage System.
- i. Central plant (2.5 marks)
 - ii. Air System (2.5 marks)

Question 2

- (a) State four (4) types of Ice Thermal Storage and explain the application for each system. (8 marks)
- (b) Explain with sketches two (2) types of basic storage strategies. (12 marks)

Question 3

- (a) List two (2) types of brine together with its freezing point which normally used in Ice Storage System.

(6 marks)

- (b) Differentiate with help of sketches, Ice on Coil Internal Melt and Ice on Coil External Melt Systems.

(14 marks)

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

- (a) Explain clearly the characteristic of Brine. (10 marks)
- (b) Describe clearly the charging and discharging process in Encapsulated Ice System. (10 marks)

Question 5

- (a) List down and sketch two (2) possible arrangement of chiller in encapsulated ice when using partial storage. (10 marks)
- (b) From the two (2) possible arrangement of chiller in question Q5 (a) , further elaborate one (1) with respect to cool storage. (10 marks)

Question 6

- (a) Sketch and explain the charging process in Ice Slurry System. (10 marks)
- (b) Explain in detail how the usage of thermal storage system in a building can reduce the equipment size? (10 marks)

END OF QUESTION