



UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION
JANUARY 2011 SESSION

SUBJECT CODE : FCB 20703
SUBJECT TITLE : STUDY OF AIR CONDITIONING EQUIPMENT & SYSTEMS
LEVEL : BACHELOR
TIME / DURATION : 3.00 pm – 6.00 pm
(3 HOURS)
DATE : 06 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. Answer all questions in English.

THERE ARE 3 PAGES OF QUESTIONS, 1 PAGE OF APPENDIX EXCLUDING THIS PAGE.

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

Question 1

Lithium Bromide-Water Absorption Chiller

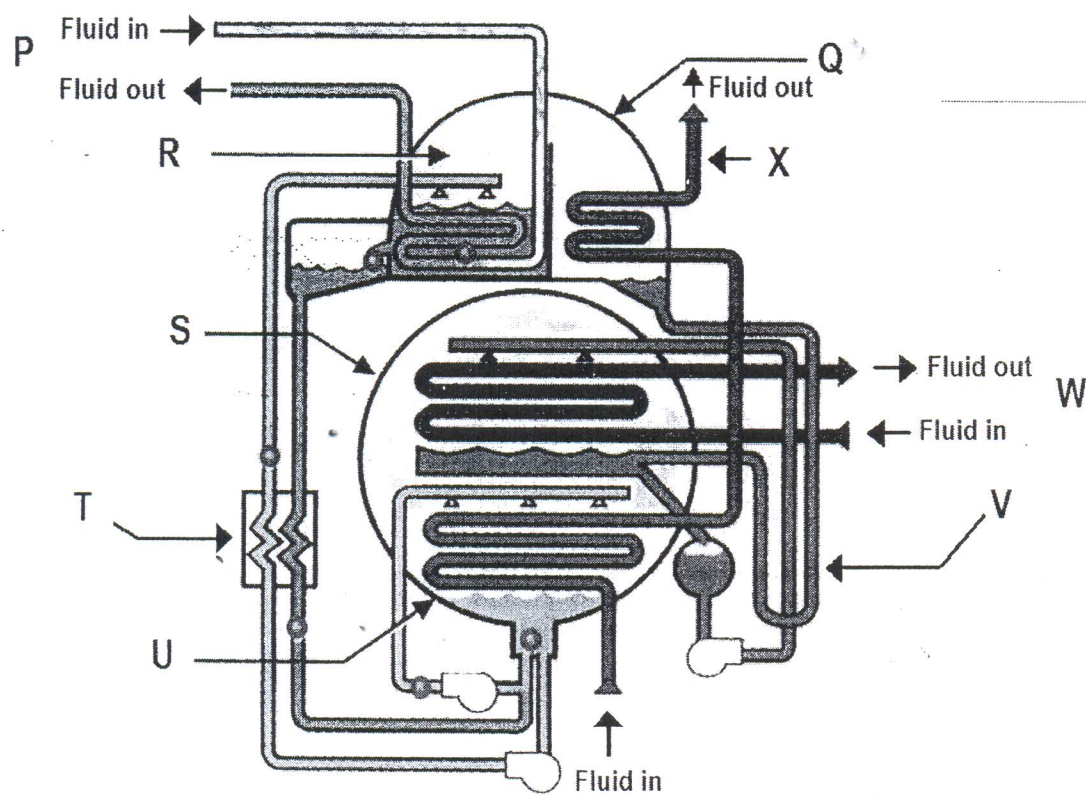


Figure Q1: Lithium bromide – Water absorption chiller

Referring to Figure Q1, name the components and fluids labeled under P, Q, R, S, T, U, V, W and X.

(35 marks)

Question 2.

You are given :

1) Referring to the Air Handling Unit (Figure 2) for the operation of cooling coil:

- indoor design condition : 24 °C DB, 50 % RH
- outdoor condition : 33 °C DB, 80 % RH
- fresh air intake = 20% 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 = 70 kW

2) Psychrometric chart (Chart 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
(Attachment Psychrometric chart).
- (20 marks)
- (b) To calculate the supply air volume delivered to space in m³/s.
- (15 marks)

Question 3

- (a) List the 5 air qualities which control the air conditioning system.
(5 marks)
- (b) Draw the four 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)
- (c) As a consulting engineer in an established consulting firm, your client asked you to provide design criteria for air conditioning system for high rise office building in Kuala Terengganu. Explain your answer.
(5 marks)
- (d) 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 filters need to be changed instantaneously when required. Give two (2) methods in order to solve this problem and describe your answer briefly.
(10 marks)

END OF QUESTIONS

APPENDIX 1 (TO BE RETURNED)

CIBSE PSYCHROMETRIC CHART

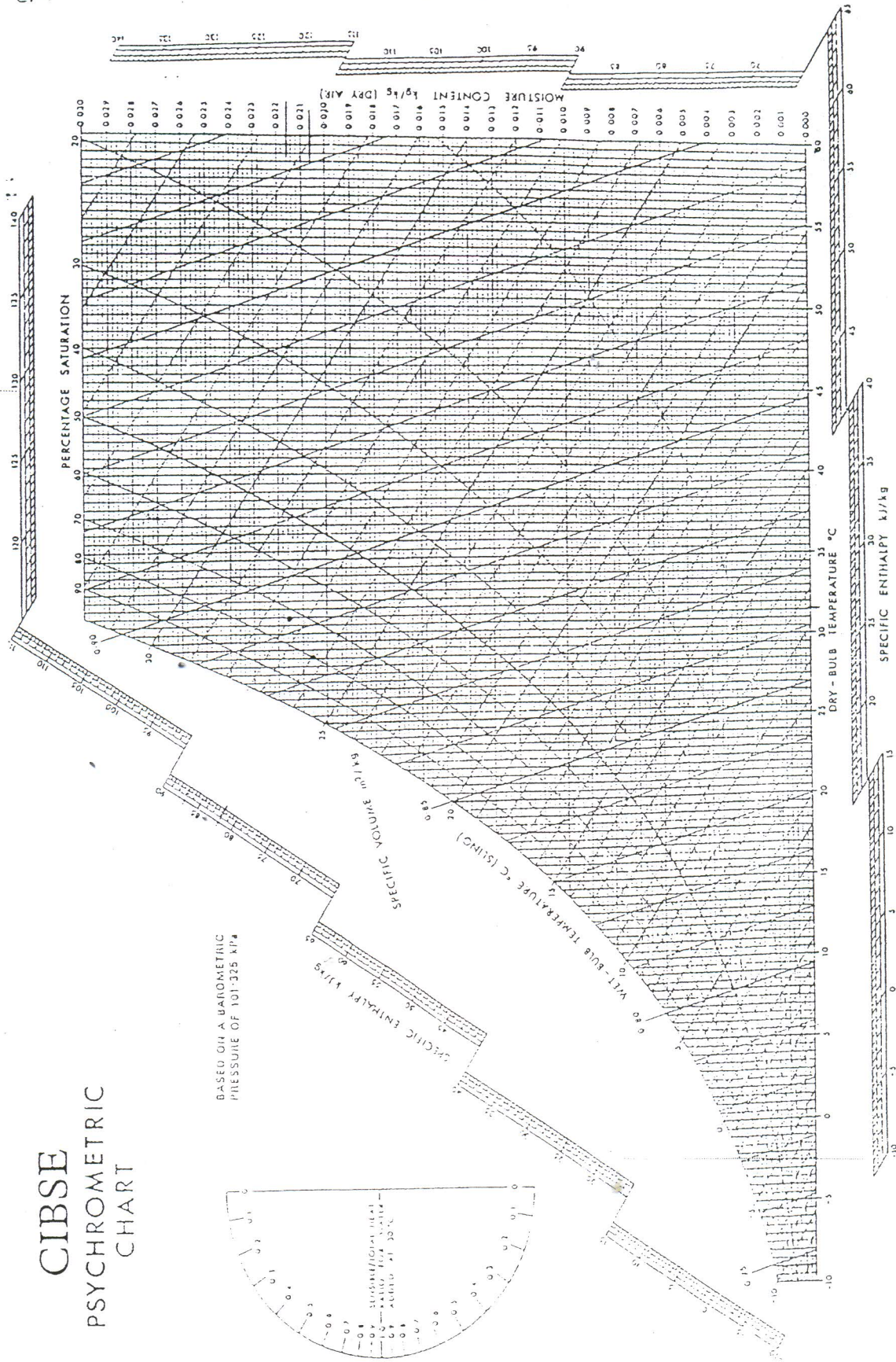


Fig. C1.2 CIBSE Psychrometric Chart 1 - 10°C to 60°C

Pads of 50 charts (A3 size) are available from the CIBSE, Delta House, 222 Baffin High Road, London, SW14 9BS