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|---------------------------|-------------|--------------|
| Name                      | Student I D |              |

## Department of Mining and Materials Engineering Faculty of Engineering Prince of Songkla University

Final Examination for Semester: 2

Date: February 24, 2006

Subject: 237-322 Metallic Materials

Academic Year: 2005

Time: 13.30-16.30

Room: R300

## **Instructions**

1. This exam is consisted of 2 parts, part A and part B. Please do both of them, write your answers on the space provided after each problem set. If you need more space, you can write on the back of paper.

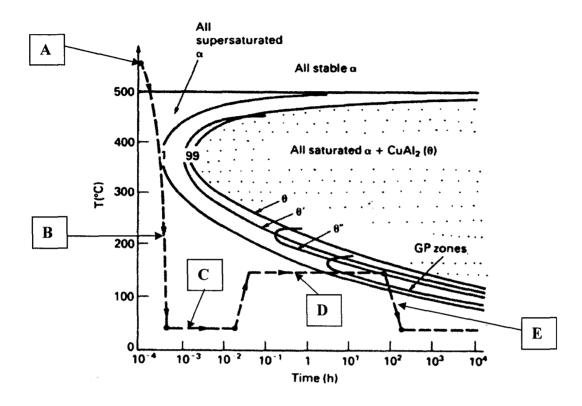
- 2. Only one piece of A4-size note is allowed. It can be written on both sides.
- 3. Dictionary, calculator, and stationery are allowed.
- 4. Text books and other studying materials are not allowed.
- 5. This exam is counted for 50% of the total grade.

Asst. Prof. Dr. Thawatchai Plookphol Asst. Prof. Dr. Weerawan Suthisripok

Name.....Student I.D....

Part A. (Dr. Thawatchai's part, 30%)

1. A TTT diagram for the Al-4 wt% Cu alloy is given below.



| aplain heat treatment process (indicated by the dash line) in order to get peak strength | of the |
|--|--------|
| oy. Please state the temperature, time and phase transformation in each step, i.e. step  | A, B,  |
| D and E. (15 points)   |        |
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| NameStudent   | I.D  |
| 10. Please give 3 end uses of zinc? (3 points)            |  |
|   |  |
|   |  |
| 11. What is load from soldering allows (2 points)         |  |
| 11. What is lead-free soldering alloy? (2 points)         |  |
|   |  |
|   |  |
| 12. What are the important characteristics of lead-free s | solders? (6 points)  |
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| NameStudent I.D   |                                       |  |  |  |
|---|---------------------------------------|--|--|--|
| Part B. (Dr. Weerawan's part, 20%)  |                                       |  |  |  |
| B1. Describe main characteristics of <u>ferritic</u> , <u>austenitic</u> and <u>martensitic</u> including major alloy addition, main characteristics (advantages and limitation |                                       |  |  |  |
| example of common AISI grade and its application.   | (15 marks)                            |  |  |  |
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