

Prince of Songkla University

Faculty of Engineering

Final examination: Semester 2

Academic year: 2006

Date: 1 March 2007

Time: 13.30-16.30

Subject: 226-211 Welding and joining processes

Room: A201

ทฤษฎีในการสอบ โทษขั้นต่ำคือพักการเรียน 1 ภาคการศึกษาและปรับตกในรายวิชาที่ทฤษฎี

Instruction : Attempt all questions, totaling 100 marks.

This is an open-book exam, anything can be brought in.

1. It is good practice for welders to try to minimize the heat input during welding. Explain the reason, the consequence, and means to minimize the heat input. (10 marks)
2. Describe the weldability of the following materials, covering causes of tentative problems and the ways to avoid those problems: (28 marks)
 - 2.1 Aluminum and its alloys.
 - 2.2 Titanium and its alloys.
 - 2.3 High tension steel (same as high strength low alloyed steel).
 - 2.4 Austenitic Stainless steel.
3. Give a critical comparison between friction welding and resistance butt welding, covering their principles, and characteristics of the welds. (10 marks)
4. Describe the metallurgical phenomena at the weld affected metal, ranging from weld metal to heat affected zone. The description should cover the significance of the related equilibrium phase diagram and the continuous cooling transformation diagram. (12marks)
5. Compare the advantages and disadvantages of electron beam welding and laser welding. (10 marks)
6. Discuss the influence of chemical composition of the weld metal upon bond embrittlement. (10 marks)
7. List causes for weld cracking and the methods of preventing weld cracks. (10 marks)
8. Discuss the factors that contribute to the sensitivity of lamellar tearing in the weld. (10 marks)

Phichit Rerngsangvatana

