元智大學 103 學年度研究所 **碩士班** 招生試題卷

系(所)別：化學工程與材料科學學系碩士班　組別：不分組-選考B　科目：材料導論　用紙第 1 頁共 1 頁

●可使用現行『國家考試電子計算器規格標準』規定第二類之計算機

(10%) 1. What are the main differences between ionic bonding and covalent bonding? *(10%)*

(30%) 2. (a) Show the curves of stress vs. strain for typical metal, ceramic and polymer, respectively *(15%)* and (b) describe what the differences are? *(5%)* (c) What are the definitions of yield strength and tensile strength? *(10%)*

(10%) 3. What is the difference between solid solution and intermetallic compound in metal? *(5%)* Show one example. *(5%)*

(20%) 4. (a) The density, lattice parameter and molecular weight of Nickel is 9.495 g/cm^3, 0.345 nm and 58.7, respectively, please show the structure of Nickel is BCC or FCC, Why? *(10%)* (b) Show the slip system for Nickel. *(10%)*

(10%) 5. Show the strategies for strengthening metal, explain the reasons. *(10%)*

(20%) 6. (a) Show the isothermal transformation diagram (TTT diagram) for an eutectoid steel *(10%)* and show the process how to obtain (b) fine pearlite *(5%)* and (c) Martensite *(5%)* using TTT diagram.

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