

系所組別： 口腔醫學研究所丙組

考試科目： 材料科學

考試日期：0308，節次：2

※ 考生請注意：本試題 可 不可 使用計算機

1. Describe simple eutectic phase diagrams. On these diagrams label the various phase regions. Label liquidus, solidus, and solvus lines. (10%)
2. Describe, explain, and make schematic plots the relative Burgers vector-dislocation line orientation for edge, screw, and mixed dislocations. (10%)
3. What is unit cell? Draw the unit cells for body-centered cubic, face-centered cubic, and hexagonal close-packed crystal structures. (10%)
4. For metal, the coordination number and the atomic packing factor are two important characteristics of crystal structure? Please explain and give example. (10%)
5. Describe and compare the steady-state diffusion and the non-steady-state diffusion. (10%)
6. Describe and make schematic plots of the typical engineering stress-strain behaviors. (10%)
7. For metal process, the deformation would be used to improve the mechanical properties in the high temperature. What is the benefit in high temperature process? (10%)
8. Explain why crystalline ceramic materials are normally brittle. (10%)
9. Make schematic diagram of atomic structure of grain boundary and twin boundary. (10%)
10. Calculate the radius of an iridium atom, given that Ir has an FCC crystal structure, a density of  $22.4 \text{ g/cm}^3$ , and an atomic weight of  $192.2 \text{ g/mol}$ . (10%)