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：0224，節次：2

※ 考生請注意：本試題不可使用計算機

1. (a) Briefly cite the main differences between ionic, covalent, and metallic bonding. (b) Sate the Pauli exclusion principles. **(10%)**

2. Explain why the properties of polycrystalline materials are most often isotropic. **(10%)**

3. Cite the relative Burgers vector-dislocation line orientations for edge, screw, and mixed dislocations. **(10%)**

4. Briefly explain the concept of steady state as it applies to diffusion. **(10%)**

5. Cite five factors that lead to scatter in measured material properties. **(10%)**

6. Explain the differences in grain structure for a metal that has been cold worked and one that has been cold worked and then recrystallized. **(10%)**

7. Cite three processing techniques that are employed to enhance the creep resistance of metal alloys. **(10%)**

8. What is the difference between a phase and a microconstituent? **(10%)**

9. Cite two major differences between martensitic and pearlitic transformations. **(10%)**

10. How would you expect a decrease in the austenite grain size to affect the hardenability of a steel alloy? Why? **(10%)**