編號： 162

國立成功大學 105 學年度碩士班招生考試試題

系　　所：生物醫學工程學系

考試科目：材料導論

考試日期：0227，節次：2

※ 考生請注意：本試題不可使用計算機。　請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. Explain or distinguish the following terms: (1) Yield strength vs tensile strength, (2) amorphous vs crystalline, (3) Mechanical twin vs Annealing twin, (4) Frenkel defect vs Schottky defect, (5) Fatigue vs creep, (6) Isotropic vs anisotropic **(24%)**
2. Would you expect a crystalline ceramic to strain harden at room temperature? Why? **(10%)**
3. Please explain the phenomena of superheating and supercooling. Why do they occur? **(10%)**
4. What is Tm and Tg for polymers? How to increase Tg for polymer? **(10%)**
5. What are the driving force for (1) diffusion in solids (2) grain growth (3) recrystallization (4) sintering. **(10%)**
6. Describe (1) the possible microstructure of cast ions and (2) the major defects introduced in solidification. **(10%)**
7. Calculate the atomic packing factor (APF) for the FCC unit cell, assuming the atoms to be spheres **(10%)**
8. Make a simple sketch of (100), (200), and (111) planes in FCC unit cells. Compare the planar densities on the (100), (200), and (111) planes in FCC unit cells. **(10%).**
9. Draw the Fe-Fe_3C phase diagram. **(6%)**