

※ 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. Define hardenability, and how to measure the haredenability? **(10%)**
2. Explain: (1) Band gap energy, (2) Brittle fracture, (3) Burgers vector, (4) Carburizing, (5) Cold working, (6) Edge dislocation, (7) Flexural strength, (8) Frenkel defect, (9) Galavanic corrosion, (10) Grain growth, (11) Intergranular fracture, (12) Level rule, (13) Passivity, (14) Phase diagram, (15) Precipitation hardening, (16) Scanning electron microscopy, (17) Semiconductor, (18) Stress concentration, (19) Wrought alloy, (20) Vacancy diffusion. **(50%)**
3. What is shape memory alloy? Please explain the possibility of shape memory alloy is used in the medical application. **(10%)**
4. Please describe the features to form the solid solution. Why the solute atoms could prevent the movement of the dislocation? **(10%)**
5. The coordination number and the atomic packing factor are two important characteristics of a crystal structure. Please explain and give example. **(10%)**
6. Describe (a) the possible microstructure of cast irons and (b) the major defects introduced in solidification. **(10%)**