

※ 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. What is unit cell? Draw the unit cells for body-centered cubic, face-centered cubic, and hexagonal close-packed crystal structures. (10%)
2. Describe simple eutectic phase diagrams. (10%)
3. Please explain and compare (a) intrinsic semiconductor and (b) extrinsic semiconductor. (10%)
4. What is shape memory alloy? Please explain the possibility of shape memory alloy is used in the medical application. (10%)
5. What is the characteristic of ceramics? Please explain the possibility of ceramics is used in the medical application. (10%)
6. Describe and make a drawing of the edge, screw, and mixed dislocation. (10%)
7. Compare the differences between steady-state and non-steady-state diffusion. (10%)
8. Cite three processing techniques that are employed to enhance the creep resistance of metal alloys. (10%)
9. Please explain and compare (a) martensitic transformations and (b) pearlitic transformations. (10%)
10. Please explain and compare (a) Energy Dispersive X-ray Spectrometer and (b) X-ray diffraction analysis. (10%)