國立成功大學

111學年度碩士班招生考試試題

編　　號：323

系　　所：口腔醫學研究所

科　　目：材料科學

日　　期：0220

節　　次：第 3 節

備　　註：不可使用計算機

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※ 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. Show for the body-centered cubic (BCC) crystal structure that the unit cell edge length $a$ and the atomic radius $R$ are related through $a = 4R/\sqrt{3}$.　　**(10%)**

2. Please explain why HCP (hexagonal closed-packed) metals are typically more brittle than FCC (face-centered cubic) and BCC (body-centered cubic) metals. **(10%)**

3. Describe and make a drawing of the edge, screw, and mixed dislocation. **(10%)**

4. Explain (a) engineering stress, (b) engineering strain, (c) eutectic reaction, (d) phase diagram.　　**(20%)**

5. **Explain** (a) unit cell, (b) solid solution strengthen, (c) recrystallization and its temperature, (d) intrinsic semiconducting materials.　　**(20%)**

6. (a) Describe and explain Fick's first law, (b) Describe and explain Fick's second laws. **(10%)**

7. Name and describe eight different ionic point defects that are found in ceramic compounds.　　**(10%)**

8. Explain why crystalline ceramic materials are normally brittle.　　**(10%)**