國立臺灣科技大學
九十四學年度碩士班招生考試試題

系所組別：機械工程系碩士班戊組
科　　目：工程材料

總分100分

1. What is the difference between "materials science" and "materials engineering"? (10%)

2. Would you expect Fe (iron) or W (tungsten) to have the higher modulus of elasticity? Explain. (10%)

3. Write down the close-packed planes of HCP structure and FCC structure. (6%)

4. List all factors that will affect the rate of diffusion. (14%)

5. List the conditions that must be satisfied for two metals or two compounds to have unlimited solid solubility. (10%)

6. Explain the following terms in thermal properties of materials: (a) thermal shock; (b) thermal stresses; (c) phonon; (d) specific heat. (12%)

7. Explain the following terms in photonic materials: (a) photoconduction; (b) fluorescence; (c) phosphorescence; (d) light-emitting diodes (LEDs). (12%)

8. Explain the following terms in magnetic materials: (a) ferromagnetism; (b) ferrimagnetism; (c) hard magnet; (d) Curie temperature. (12%)

9. Explain the following terms in electronic materials: (a) energy gap (bandgap); (b) extrinsic semiconductor; (c) radiative recombination; (d) avalanche breakdown. (14%)