

系所組別： 機械工程學系丁組

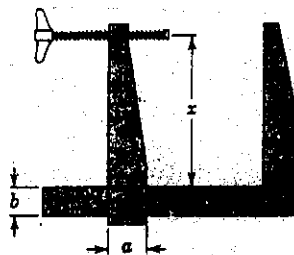
考試科目： 機械製造及材料

考試日期： 0307，節次： 2

※ 考生請注意：本試題 可 不可 使用計算機

1. 請列舉說明金屬強化之機構與原理，並各舉工程應用上之機械材料為例作說明 (10分)
2. 熱加工與冷加工如何作區別？其對金屬材料之機械性質及顯微結構之影響又如何？何種情形下冷加工材料需要退火？(10分)
3. 請解釋說明材料之破斷韌性(Fracture Toughness)與破斷強度(Fracture Strength)，以及應力集中係數(Stress Concentration Factor)與應力強度因子(Stress Intensity Factor)之區別及應用！(10分)
4. 解釋名詞：(20分)
 - (1) LCF 和HCF
 - (2) (繞射) 布拉格定律
 - (3) 非均質成核(Heterogeneous)/ 均質成核(Homogenous Nucleation)
 - (4) (合金平衡凝固) 槓桿定律
 - (5) 淬火與回火熱處理

5. The left-hand jaw of the C-clamp can be slid along the frame to increase the capacity of the clamp. To prevent slipping of the jaw on the frame when the clamp is under load, the dimension x must exceed a certain minimum value. Find this value corresponding to given dimensions a and b and a coefficient of friction f between the frame and the loose-fitting jaw. (15%)



(背面仍有題目,請繼續作答)

系所組別： 機械工程學系丁組

考試科目： 機械製造及材料

考試日期： 0307，節次： 2

※ 考生請注意：本試題 可 不可 使用計算機

6. Estimate the normal anisotropy R of a metal sheet when it is stretched by 23% in length, decrease in thickness by 10%. Note that the normal anisotropy is defined as the ratio of width strain to thickness strain. (15%)

7. In the figure are shown the elements of a rolling mill. Determine the maximum thickness b which the slab may have and still enter the rolls by means of the friction between the slab and the rolls. Assume that the coefficient of friction is f and that $b-a$ is small compared with d . (20%)

