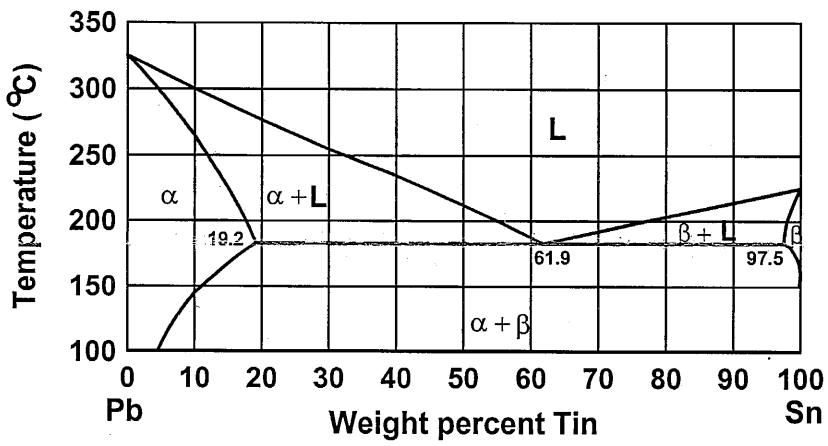
大同大學 九十四 學年度 轉學考試 試題

考試科目：材料導論　系別：材料工程學系　　第　　頁，共 / 頁

註：本次考試不可以參考自己的書籍及筆記；　不可以使用字典；　可以使用計算器。

1. Why is there no base-centered cubic lattice?　(10%)
2. What are the edge, screw and mixed dislocations?　(10%)
3. Describe the strengthening mechanisms in metals by grain boundary, solid-solution, precipitation and strain hardening. (10%)
4. Plane-stress fracture toughness (K_C) is sensitive function of specimen thickness. Plan-strain conditions generally prevail when thickness $\geq 2.5\ (K_{IC}/Y.S.)^2$. (10%)
5. A Pb-Sn alloy contains 60wt% pro-eutectic α and 40wt% eutectic α+β at a temperature below but very close to the eutectic temperature. Calculate the average composition of this alloy.　(10%)



6. How to evaluate the microstructure after some cooling processes by TTT or CCT diagrams. (10%)
7. Explain the following heat treatments: (a) Martensitic transformations, (b) Tempering, (c) Martempering, and (d) Austempering. (10%)
8. How does the conductivity vary with temperature for intrinsic, n-type and p-type extrinsic semiconductors?　(10%)
9. Explain the following terms: (a) thermal couples, (b) superconductors, (c) dielectric, and (d) piezoelectrics. (10%)
10. Describe the following nouns: (a) diode, (b) transistor, (c) ferromagnetism, (d) ferrimagnetism. (10%)