Homework #6
MEMT 201

1. What are the chemical phase compositions of the following alloys?

a. 15 wt% Sn – 85 wt% Pb at 100 deg. C.
- α and β phases are present
- C_α = 5% Sn – 95% Pb
- C_β = 97% Sn – 3% Pb

b. 25 wt% Pb – 75 wt% Mg at 425 deg. C.
- Only α phase is present
- C_α = 25% Pb – 75% Mg

c. 85 wt% Ag – 15 wt% Cu at 800 deg. C.
- Liquid and β phases are present
- C_L = 75% Ag – 25% Cu
- C_β = 93% Ag – 7% Cu

d. 55 wt% Zn – 45 wt% Cu at 600 deg. C.
- β' and γ phases are present
- $C_{\beta'}$ = 50% Zn – 50% Cu
- C_γ = 58% Zn – 42% Cu

2. What are the weight fractions of each phase in Problem 1?
   a. SnPb Alloy
      - W_α = (97% - 15%)/(97% - 5%) = 89%
      - W_β = (15% - 5%)/(97% - 5%) = 11%
   b. PbMg Alloy
      - W_α = 25% Pb
   c. AgCu Alloy
      - W_L = (93% - 85%)/(93% - 75%) = 44%
      - W_β = (85% - 75%)/(93% - 75%) = 56%
   d. ZnCu Alloy
      - $W_{\beta'}$ = (58% - 55%)/(58% - 50%) = 38%
      - W_γ = (55% - 50%)/(58% - 50%) = 63%