國立成功大學

113學年度碩士班招生考試試題

編　號：82

系　所：資源工程學系

科　目：熱力學

日　期：0201

節　次：第 2 節

備　註：不可使用計算機

※ 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) Please state the following two processes (a,b) in detail from thermodynamics point of view：

(a) Reversible process (5%)

(b) Irreversible process (5%)

(c) Please make an example to describe irreversible process (5%)

(d) Please make an example to describe reversible process (5%)

(2) Point out which of the following statements are wrong and explain：

(a) During a reversible process the entropy change of a system is zero (5%)

(b) During an irreversible process the entropy change of a system is greater than zero (5%)

(c) There is no such an engine that could fully convert heat from a single reservoir to work (5%)

(d) Heat could be conducted from a high temperature reservoir to a low temperature reservoir without any loss of heat. (5%)

(3) Consider the dilute solid solution of A in B. Prove that if the solute obey Henry's law then the solvent obeys Raoult's law (20%).

(4) When pressure is increased, what will happen to the melting temperature of ice? What will happen to the boiling temperature of water? Explain your results. (20%)

(5) The Gibbs-Duhem equation is $\sum X_i \, d\bar{Q}_i = 0$. What are the notations $X_i \text{ and } \bar{Q}_i$ in the equation? Specify the thermodynamic conditions in which the equation is applicable. What are the differences among the ideal, the regular and the non-regular solutions? (20%)