

國立中央大學八十八學年度轉學生入學試題卷

資訊工程學系 三年級 科目：離散數學 共 / 頁 第 / 頁

DISCRETE MATHEMATICS

- (20%) 1. Find the power sets of each of the following sets:
- (a) \emptyset
 - (b) $\{\emptyset\}$
 - (c) $\{\emptyset, \{\emptyset\}\}$
- (20%) 2. In the poset $(P(S), \subseteq)$ of subsets of a set S , What is
- (a) $A \wedge B$?
 - (b) $A \vee B$?
 - (c) the maximum element?
 - (d) the minimum element?
- (20%) 3. In a room where there are more than 50 people with ages between 1 and 100, show that
- (a) Either two people have the same age or there are people whose ages are consecutive integers.
 - (b) Either two people have the same age or one person's age is a multiple of another's.
 - (c) Some of the people shake hands. Show that at least two shook the same number of hands. ("No hands" is a possibility.)
- (20%) 4. A connected graph G has 11 vertices and 53 edges. Show that G is Hamiltonian but not Eulerian.
- (20%) 5. Suppose T_1 and T_2 are different spanning trees of a connected graph G , and e is an edge in T_2 which is not in T_1 . Prove that there is an edge f in T_1 , which is not in T_2 such that $T_1 \cup \{e\} \setminus \{f\}$ is a spanning tree in G .