

共 8 大題。總分 100 分。

1. [10 points] Assume that there are 3 types of license plates,  $@@##-@$ ,  $#@@#$ ,  $@@@##$ , where  $@$  is in  $\{A, B, \dots, Z\}$  and  $\#$  is in  $\{0, 1, \dots, 9\}$ . Write an algorithm to generate all these license plates.
2. [15 points] As (1), how many different license plates can we have for each type?
3. [10 points] Use “ $\sim$ ”, “ $\wedge$ ”, “ $\vee$ ”, “ $\rightarrow$ ” to represent “not”, “and”, “or”, “implication” in Logic and Discrete Mathematics. What’s the relation between  $A \rightarrow B \wedge C$  and  $(A \rightarrow C) \wedge (A \rightarrow B)$ ?
4. [10 points] What’s the relation between  $A \rightarrow B \vee C$  and  $(A \wedge \sim B \rightarrow C)$ ?
5. [15 points] Prove that a logic rule (with “ $\sim$ ”, “ $\wedge$ ”, “ $\vee$ ”, “ $\rightarrow$ ”) can be represented by a set of “ $a \wedge b \wedge \dots \wedge y \rightarrow z$ ” rules.
6. [15 points] How many ways can we get 3 cards from the standard deck of 52 cards where their total points are larger than 16? (Note that “A” can be 1 point or 11 points. “J”, “Q”, “K” are 10 points.)
7. [15 points] What is coefficient of  $x^2 y^3$  in  $(x-2y+3z-4/z+5)^{16}$ ?
8. [10 points] Show that  $8a-16b+3$  and  $5a-10b+2$  are relatively prime.

試題隨卷繳回