

元智大學 108 學年度 碩士班 招生試題卷

系(所)別：電機工程學系碩士班 組別：甲組

科目：計算機概論

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●不可使用電子計算機

1. (8%) Describe the model of Turing machine and Von Neumann machine
2. (4%) What are the values of "11100101" in sign-and-magnitude and two's complement representation respectively?
3. (6%) What are the three main components of CPU?
4. (6%) Write the three steps of CPU execution cycle and describe the meaning of each step.
5. (10%) What are the difference between RISC and CISC?
6. (10%) What are the five layers in TCP/IP protocol suite? Please also describe the function of each layer.
7. (6%) Show the result of the following operations:
 - a. (2%) NOT (AD)₁₆
 - b. (2%) (1F)₁₆ AND (19)₁₆
 - c. (2%) (3B)₁₆ OR (20)₁₆
8. (24%) Choose the correct answer:
 - (a) (8%) What is the efficiency of the insertion sort: (A) $O(1)$. (B) $O(n)$. (C) $O(n^2)$. (D) $O(n \log n)$.
 - (b) (8%) What is the efficiency of the quick sort: (A) $O(1)$. (B) $O(n)$. (C) $O(n^2)$. (D) $O(n \log n)$.
 - (c) (8%) What is the operation of a queue: (A) FIFO (first in first out). (B) LIFO (last in first out). (C) high priority first.
9. (10%) Please give examples to describe what are high-level language, assembly language, and machine language?
10. (16%) Multiple choices (Choose the correct answers): What improvements will make a computer's performance to be better (less CPU time)? (A). Algorithm, (B). Programming language (C). Compiler (D). Instruction set architecture