

# 元智大學 107 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. (10%) Please transfer the two following numbers into decimal:  
(a) (5%)  $(0FA7.A)_{16}$  (b) (5%) 1001.001 (binary)
2. (10%) A 64-bit computer has 6GB (Gigabytes) memory:  
(a) (5%) What are the total bytes of the memory?  
(b) (5%) How many bits does it need to address any single word in memory?
3. (4%) What are the values of "10101101" in sign-and-magnitude and two's complement representation respectively?
4. (10%) What are the five layers of the TCP/IP protocol suite? Please also introduce their functions.
5. (5%) What is the difference between TCP and UDP?
6. (6%) Let a, b, c, d be four Boolean variables,  $a=c=True$ ,  $b=d=False$ , please find the value of the following Boolean formula.  
(a) (3%)  $(a \text{ AND } (\text{NOT } b)) \text{ AND } (c \text{ OR } d)$   
(b) (3%)  $(a \text{ OR } d) \text{ OR } ((\text{NOT } b) \text{ AND } c)$
7. (5%) What is operation system? What is its function?
8. (18%) Choose the correct answer:  
(a) (6%) What is the efficiency of the insertion sort: (A)  $O(1)$ . (B)  $O(n)$ . (C)  $O(n^2)$ . (D)  $O(n \log n)$ .  
(b) (6%) What is the efficiency of the quick sort: (A)  $O(1)$ . (B)  $O(n)$ . (C)  $O(n^2)$ . (D)  $O(n \log n)$ .  
(c) (6%) What is the operation of a stack: (A) FIFO (first in first out). (B) LIFO (last in first out). (C) high priority first.
9. (8%) A nearly complete binary tree has nine nodes. The breadth traversal of the tree is given as: JCB ADEFG. Draw the tree.
10. (12%) Please give examples to describe what are high-level language, assembly language, and machine language?
11. (12%) 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