

系所組別：製造資訊與系統研究所乙組

考試科目：計算機概論

考試日期：0220，節次：2

※ 考生請注意：本試題 可 不可 使用計算機

## 1. Single Choice (20%)

- (1) The data structure used in Relational Database:  
(A) Tree (B) File (C) Table (D) Array
- (2) The tool used in Relational data base analysis:  
(A) Network (B) ER Diagram (C) Data Flow Diagram (D) State Diagram
- (3) How long will it take to download a true color picture (4byte/pixel) with 1024x1024 resolution via ADSL (Up/Down TR: 256K/64K bps):  
(A) 64 Second (B) 128 Second (C) 256 Second (D) 512 Second
- (4) Which of the following characteristics does **not** exist in object-oriented programming languages: :  
(A) Orientation (B) encapsulation (C) inheritance (D) polymorphic
- (5) Which of the following languages is **not** a general-purpose language:  
(A) PASCAL (B) Java (C) SQL (D) C
- (6) The prefix expression of the infix expression “(a-b)\*c+d/e”:  
(A) ab-c\*de/+ (B) de/+c\*ab (C) \*ab-c+/de (D) +\*-abc/de
- (7) The result of 10011011 XOR 10110110:  
(A) 10111111 (B) 00101101 (C) 10010000 (D) 11010010
- (8) Which of the following Boolean algebra expressions is **wrong**:  
(A)  $X*X=1$  (B)  $X+1=1$  (C)  $X(Y+Z) = XY+XZ$  (D)  $X+Y=X*Y$
- (9) Assume  $A = (1001001.011)_2$ ,  $B = (243.001)_5$ ,  $C = (81.372)_9$ , then:  
(A)  $B>C>A$  (B)  $A>C>B$  (C)  $C>A>B$  (D)  $B>A>C$
- (10) Assume  $x=6$ ,  $y=3$  and  $z=5$ , compute the value of  $z$  by executing  $z+=(++x-y)*z--$  using C++ language :  
(A) 22 (B) 23 (C) 24 (D) 25

## 2. Explain the following abbreviations/terms: (30%)

- a. Virtual memory
- b. Parity check
- c. EFT
- d. Proxy Server
- e. Cloud Computing
- f. Theory of locality

(背面仍有題目,請繼續作答)

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3. Develop a recursive program to compute the following recursion function  $R(n, k)$ : (10%)

$$R(n, 0) = 1 \text{ and } R(n, n) = 1 \text{ for } n \geq 0$$

$$R(n, k) = C(n-1, k) + R(n-1, k-1) \text{ for } n > k > 0$$

4. Compute the time complexity of your program of the previous question. (5%)

5. Use a link list to represent the following 5x5 matrix A. (10%).

```
0 0 3 0 4
1 0 0 0 0
0 5 0 0 2
0 0 0 0 0
0 0 0 8 0
```

6. Write an algorithm to determine whether any two Trees are identical. (15%)

7. Show that "Insertion sort" can be a sorting algorithm by Induction (歸納法). (10%)