國立中正大學
109學年度碩士班招生考試
試 題

[第1節]

科目名稱	計算機概論
系所組別	資訊管理學系－ 甲組 乙組

－作答注意事項－

※作答前請先核對「試題」、「試卷」與「准考證」之系所組別、科目名稱是否相符。

1. 預備鈴響時即可入場，但至考試開始鈴響前，不得翻閱試題，並不得書寫、畫記、作答。
2. 考試開始鈴響時，即可開始作答；考試結束鈴響畢，應即停止作答。
3. 入場後於考試開始40分鐘內不得離場。
4. 全部答題均須在試卷（答案卷）作答區內完成。
5. 試卷作答限用藍色或黑色筆（含鉛筆）書寫。
6. 試題須隨試卷繳還。

[Session I] Multiple Choice

Choose ONE answer only for each question (4 points for each question)

選擇題(單選，每題 4 分)

1. Which value is the result of the following subtraction problem using two's complement notation?

   00001111 - 10101010

   A. 10110101　　B. 10111001　　C. 01010101　　D. 011000101

2. Which of the following items of information linked together in Berners-Lee "web of notes" ?

   A. Trails　　B. Nodes　　C. Links　　D. Icons

3. Which layer of the TCP/IP hierarchical protocol actually transmits a message?

   A. Application　　B. Transport　　C. Link　　D. Network

4. What is the output of the following code fragment?

```
int[] numarray = { 10, 20, 30, 40, 50 };
System.out.print(numarray[2]);
System.out.print(numarray[3]);
```

   A. 1050　　B. 2030　　C. 3040　　D. 4050

5. If a stack contain the entries *wa, xb, yc, zd* (from top to bottom), which of the following statement would be the contents after two entries were removed and the entry *re* was inserted?

   A. *wa, xb, re*　　B. *yc, zd, re*　　C. *re, yc, zd*　　D. *re, wa, xb*

6. The _____ relational operation combines data from more than one relation.

   A. SELECT　　B. JOIN　　C. PROJECT　　D. Schema

7. Which of the following data mining techniques would be applied when trying to identify any underlying heterogeneity within borrowers' patterns in a bank?

   A. Class description　　B. Class discrimination

   C. Cluster analysis　　D. Association analysis

8. In the RGB color system, there are 256 possible values for each red, green, and blue color. Which of the following value is the possible color could be represented?

   A. 768　　B. 16,777,216　　C. 256　　D. $1.39*10^{122}$

9. What of the following value is the time complexity of the problem of searching for a particular entry in a

list?

A. $\Theta(\log_2 n)$　　B. $\Theta(n)$　　C. $\Theta(n \log_2 n)$　　D. $\Theta(n^2)$

10. Which of the following algorithms represents an optimal solution in terms of time complexity for sorting a list?

A. Insertion sort　　B. Bubble sort　　C. Selection sort　　D. Merge sort

11. What is the output of the following code fragment?

```
int s = 1;
int n = 1;
do
{
    s = s + n;
    n++;
}
while (s < 10 * n);
System.out.println(s);
```

A. 211　　B. 210　　C. 120　　D. 123

12. S/MIME cryptographic algorithms use _____ to specify the requirement level.

A. CAN and MUST　　B. SHOULD and CAN

C. SHOULD and MIGHT　　D. SHOULD and MUST

13. Which of the following term is used for certified 802.11b products ?

A. WAP　　B. Wi-Fi

C. WEP　　D. WPA

14. Which of the following layer of the IEEE 802 reference model contain the functions of encoding and decoding of signals as well as bit transmission and reception?

A. media access layer　　B. control layer

C. logical link layer　　D. physical layer

[Session II] Problems and Calculations

1. (a) (3 pts) Rewrite the binary representations of 10.011 into its equivalent base ten representation.

(b) (3 pts) Rewrite the ten representation of 0.01 into its equivalent binary notation.

2. Under what condition is each of the following data compression techniques most effective? Please give a

specific example or explanation of each.

(a) (4 pts) Run-length encoding

(b) (4 pts) Relative encoding

3. (6 pts) Identify and explain the three main categories of software. Give a specific example of each.

4. Please write the HTML tag that performs following functions.

(a) (3 pts) Begins the part that describes what will appear on the computer screen

(b) (3 pts) Marks the end of the HTML document

(c) (3 pts) Marks the beginning of a paragraph

(d) (3 pts) Marks the end of a term that is linked to another document

5. (6 pts) Given the two relations X and Y below

X:

A	*B*
2	*s*
5	*z*

Y:

C	*D*
t	*1*
r	*3*
w	*2*

Draw the relation Result that would be produced by the following statements.

Temp *JOIN X and Y where X.A > Y.D*

Result *PROJECT X.B, Y.C from Temp*

6. Suppose an operating system allocates time slices in 10 millisecond units. Assume the time required for a context switch is negligible.

(a) (3 pts) How many processes can obtain a time slice in one second?

(b) (3 pts) How many processes can obtain a time slice in one second if half of them use only half of their slice?