

考 試 科 目	計算機概論	系 所 別	資訊管理學系/資管組	考 試 時 間	2 月 18 日(一) 第一節
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I. Multiple Choice (45%, 3 points for each)

1. Compared to a file-server system, which of the following is *Not* true of using a client-server system:
 - a) higher system security
 - b) higher system scalability
 - c) higher network traffic
 - d) higher network transparency
2. A(n) _____ cookie lasts only until the browser is closed.
 - a) local
 - b) global
 - c) adaptive
 - d) session
3. Arrays must be indexed with _____ data type.
 - a) either an integer or a string
 - b) either a float and a double
 - c) either a string or a float
 - d) either a boolean or a double
4. The _____ file structure is associated with the problem of clustering.
 - a) sequential
 - b) indexed
 - c) hash
 - d) fetch
5. In a relational database, each table column represents a different _____.
 - a) data attribute
 - b) key value
 - c) session type
 - d) record set
6. Interpret the result of the following SQL query:

```
SELECT * FROM Products  
WHERE ProdcutName LIKE '_a%'
```

 - a) selects from the table Products, find any values that starts with "a"
 - b) selects from the table Products, find any values that consist with "a" and at least 3 characters in length
 - c) selects from the table Products, find any values that have "a" in the second position
 - d) selects from the table Products, find any values that ends with "a"

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7. Which type of webpages will automatically adjust the content (resize, hide, shrink, or enlarge) to display appropriately relative to the size of the device screen?
- adaptive
 - constructive
 - sensitive
 - responsive
8. Which of the following is Not true of using XML?
- It generates both machine and human readable data formats
 - It is faster to parse than any other data formats
 - It can create customized markup for any type of information
 - It can support various types of data formats
9. With a(n) _____ user interface, users interact with the software through ordinary, intuitive behavior such as touch, gesture, and voice.
- adopted
 - conditional
 - natural
 - hybrid
10. Which of the following best describe a cross-platform application?
- a program that coordinates data sharing among various devices
 - a program that communicates between different devices and networks
 - a program that runs the same way on various types of operating systems
 - a program that incorporates various aspects of operating systems
11. Which of the following is NOT true about network communications
- WAPs enables PCs and devices to transfer data wirelessly among themselves
 - WAPs have two types of antennas for optimizing signals
 - TCP/IP defines how messages are routed from one point to the other
 - TCP/IP groups data into a single packet for sending it over the Internet
12. Which of the following is not found in XML documents?
- root element
 - variables
 - data
 - namespace

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13. Which of the following best describes paging?
- a) The technique of dividing data into disk sectors
 - b) The process of converting data into information
 - c) The technique of swapping items between memory and disk
 - d) The process of transforming items into machine readable formats
14. When a system spends much of its time paging, it is said to be _____.
- a) matching
 - b) virtualizing
 - c) switching
 - d) thrashing
15. When partitioning a hard drive:
- a) the hard drive will be divided into distinct drives
 - b) the hard drive will be synchronized to the system settings
 - c) the hard drive will be connected to other hard drives in the network
 - d) the hard drive will be accessed among all the connected devices



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II. Answer the following questions (55%)

1. (15%, 5 points for each) Analyze the worst case time complexity for each of the conditions

(a)

```
int exam (int n, int m, int num) {
    if (n < 30)
        return num = n * m;
    else if (n < 90)
        return exam (n, m/2);
    else
        return exam (n/2, m);
}
```

(b)

```
void exam (int n, int m, int cnt) {
    for (int i = 0; i < n * m; i++) {
        for (int j = n; j > 0; j--)
            cnt++;
        for (int k = 0; k < i; k++)
            cnt++;
    }
}
```

(c)

```
int exam (int n, int m, int cnt) {
    for (int i = n * n; i > 0; i--) {
        for (int j = 0; j < n; j++)
            cnt++;
        for (int k = 0; k < i; k++)
            cnt++;
    }
    Return cnt;
}
```

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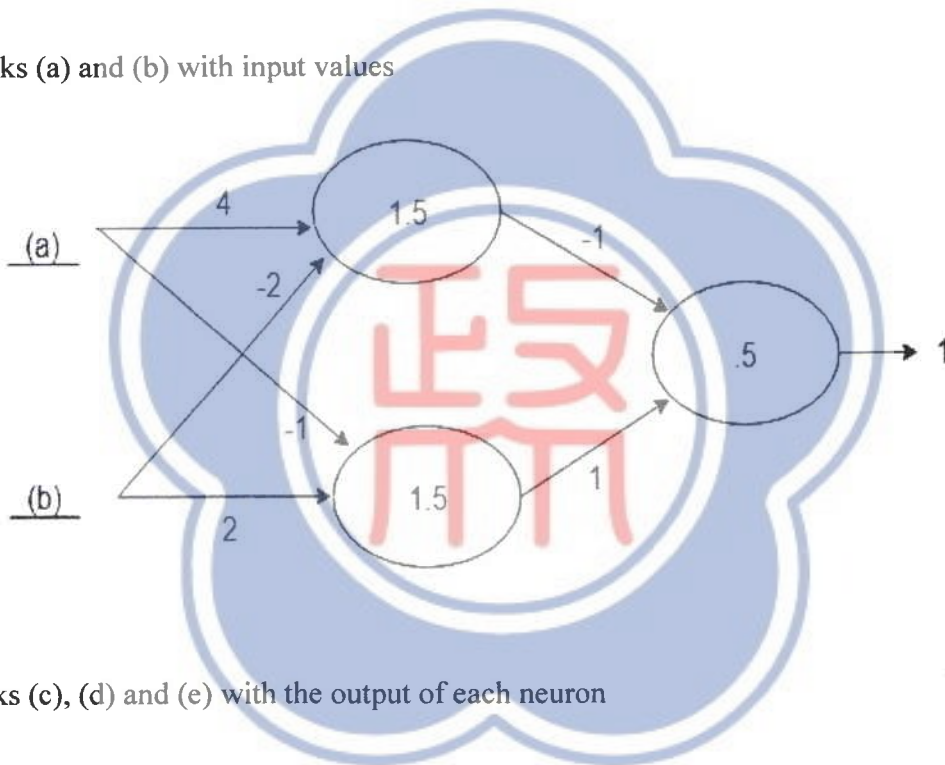
2. (8%, 4 points for each) Given an AVL tree:

- (a) What is the minimum number of nodes in a balanced AVL tree of height 5? Include appropriate explanations to defend the answer.
- (b) What is the time complexity to print out all the odd values contained in the tree in descending order. Include appropriate explanations to defend the answer.

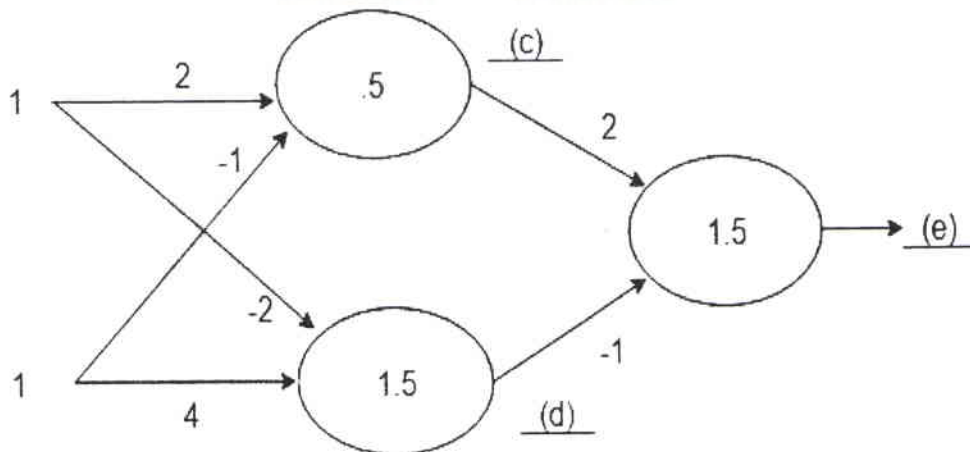
3. (20%, 4 points for each) Fill in the blanks in the artificial neural network below

(note: the upper input is 1 and the lower input is 0)

Fill in the blanks (a) and (b) with input values



Fill in the blanks (c), (d) and (e) with the output of each neuron



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4. (8%, 2 points for each) Based on the following Java code:

```
class Stacks implements StackTypes
{
    int Counter = 0;
    int CntStopper = 10;
    int[] StackNew = new int[10];
    public void push(int NewInputs)
    {
        if (Counter < CntStopper)
            StackNew[Counter++] = NewInputs;
    }
}
```

(a) after executing the following statement, what is the value of Counter associated with Stack:

```
StackTypes Stack;
```

(b) after executing the following statement, what is the value of Counter associated with Stack?

```
Stack.push(5);
```

(c) after executing the following statements, what is the value of StackNew [1] associated with Stack1?

```
StackTypes Stack1;
Stack1.push(100);
Stack1.push(130);
Stack1.push(170);
```

(d) after executing the following statements, what is the value of the variable Counter associated with Stack2?

```
StackTypes Stack2;
Stack2.push(6);
Stack2.push(7);
Stack2.push(8);
Stack2.push(9);
Stack2.push(0);
```

5. (4%) List the four conditions required for OS deadlock and give a brief description (no longer than two sentences) of each.

備

註

- 一、作答於試題上者，不予計分。
- 二、試題請隨卷繳交。