系所組別： 資訊管理研究所乙組

考試科目： 計算機概論　　　　　　　　　　　　　考試日期：0308，節次：2

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1. Multiple choice questions 單選題 每題 3 分

(1). Method overriding differs from method overloading because:
A. Overloaded methods have the same signature.
B. Overridden methods have the same signature.
C. For an overloaded constructor, the superclass constructor will always be called first.
D. For an overridden constructor, the superclass constructor will always be called first.

(2). Which type of LAN starts to slow down as the number of users increase?
A. Client/server
B. Peer-to-peer
C. Ethernet
D. Ring

(3). A point of presence (POP) is a:
A. terminal in a store that processes a local order and also connects to a company database through a WAN.
B. high-capacity transmission line carrying traffic for a WAN.
C. WAN connection point in a local geographical area.
D. node on a WAN connected to the network through wireless technology.

(4). Which of the following is NOT a true statement about packet-switching technology?
A. Packet switching is quite reliable, as alternative routes for a packet will be pursued if a portion of the network is down.
B. Packet switching is cheaper than circuit switching, as it does not require the expense of high-speed electronic switches to establish and maintain the end-to-end circuit.
C. Packet switching makes use of routers to examine packet addresses and move them along toward their destination.
D. If one packet is received out of sequence, the entire message must be retransmitted to ensure it is correct at the destination computer.

(5) Preemptive multitasking:
A. means that all open programs will shut down if one of the programs stops working.
B. is available in older versions of Microsoft Windows.
C. allows you to save your work and close the program if the program crashes.
D. returns control to the operating system if an application stops working.

(6) Virtual memory is a way to better utilize the main memory by:
A. using a hard disk swap file when memory is full.
B. using a part of ROM as an extension of RAM to conserve the main memory.
C. dividing data and instructions into multitasking units.
D. creating pages of variable size to use when the swap file is full.

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(7) Which type of LAN topology uses a single connector between workstations or devices and has terminators at its ends?
A. Bus
B. Hub
C. Ring
D. Star
E. Layered

2. Short answer questions and discussion

(1) Convert the following decimal and hexdecimal numbers to octal 4%
(a) $(153.513)_{10}$ (b) $(12A7F)_{16}$

(2) Write the following numbers in 16-bit 2s complement or write down "IMPOSSIBLE" if it can not be represented in this way. 4%
(a) 17   (b) -21

(3) Can one implement an UDP-based HTTP service on the same port, say 80, where a TCP-based Web server already runs? Why? 4%

(4) Gartner, a world-wide information technology research and advisory firm, has released its list of the top 10 strategic technologies for 2009 at the Gartner Symposium/ITxpo in Orlando, Florida, USA. These technologies, including Cloud Computing, Enterprise Mashups, and Social Software and Social Networking, are expected to have the most strategic impact in the next three years.

(a) What is cloud computing? Why is it an important strategic technology for organizations? 5%
(b) What is Web mashup technology? How can organizations benefit from it? 5%
(c) Organizations should consider adding a social dimension to a conventional Web site or application and should adopt a social platform sooner. What are social software and social networking? Also please argue this statement. 7%

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3. Multiple choice questions:
(choose only ONE answer for a question; 4% for each question)

(1) Which of the following can be considered an information-system-facilitated action for achieving knowledge mapping?

a. Build an electronic repository to record the knowledge of the experts of various professional areas related to an organization's business.

b. Use the intranet of an organization to help its employees exchange their knowledge and information among one another.

c. Build an information system that can automatically organize and send useful knowledge, such as recommended sales techniques and the latest product information, to the field sales representatives for their reference.

d. Establish electronic directories (yellow pages) to record who owns what knowledge and how a particular knowledge owner can be contacted.

e. all of the above.

(2) Business rules are specifications that preserve the integrity of a logical entity-relationship data model. Which of following can be used to address the business rule of *referential integrity*? (4%)

a. If customer requests more items than in stock, do not allow to amount on stock becomes < 0 THEN ...

b. Set constraints on valid values for an attribute

c. The same item uses the same item ID in all warehouses

d. Each instance of an entity type must have a unique identifier (or primary key value) that is not null

e. none of the above.

(3) A technique for organizing and documenting the structure and flow of data through a system's processes and or the logic, policies and procedures to be implemented by a system's processes is known as:

a. data modeling

b. process modeling

c. context modeling object modeling

d. object modeling

e. operational modeling

(背面仍有題目,請繼續作答)

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(4) Which of the following is NOT the characteristic of distributed information systems?

a. Relatively effort-free system management processes

b. Concurrent processing to enhance performance

c. Increased throughput by adding new resources

d. Sharing of hardware and software resources

e. Use of equipment and software from different vendors

(5) Which of the following technique should Joe use to prevent the information he published on his blog from being used by other people without his authorization?

a. Authentication

b. Watermark

c. Digital certificate

d. Public key infrastructure

e. Steganography

(6) _____ is a unique identifier for a document which is used to provide proof that the data has not been altered or tampered with.

a. Triple DES

b. Spoofing

c. Digital certificate

d. Watermark

e. Message digest

(7) Which of the following is true?

a. It is better to use attributes with numeric values to construct the index of a table than those with the other types of values.

b. Both primary and foreign keys cannot be composed of multiple attributes.

c. A table is in second normal form if it does not contain repeating groups and if the only determinants it contains are candidate keys.

d. Duration is a property of database transactions which are guaranteed to either completely occur, or have no effects

e. The value of a foreign key has to be unique.

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(8) _____ is a Web-based interface and integration of intranet and other technologies that gives all intranet users and selected extranet users access to a variety of internal and external business applications and services.

 a. E-tailing

 b. Enterprise application integration software

 c. Enterprise information portal

 d. Online analytical processing

 e. Dynamic page generation

4. Programming and short-answer questions:

(1) Use any programming language you want to write a program that reads in numbers until the same number is repeated successively multiple times. Ask the user "**How many times in a row should I wait for**." Then, let the program run until some number is typed successively that many times. Once the program detects the repetitions of a number, it prints a message saying that the number was repeated the given number of times.

 For example, for 2 times in a row, if the user typed "1 2 5 3 4 5 3 7" the program would still be running **To** look for 2 **times** in a row (since **the two** 5s were not typed successively). If the user then **typed** 7 ("1 2 5 3 4 5 3 7 7"), that would terminate the program because **two** 7s were **typed** one after the other. (8%)

(2) Use any programming language you want to write a program that prints all the prime numbers in 2 through 100. A prime number is an integer that is greater than 1 and is divided only by 1 and itself (e.g., 2 is a prime number). (5%)

(3) Briefly describe what the following program does. (5%)

```
element Program_1 (int m)
{
    int parent, child;
    element item, temp;
    if (HEAP_EMPTY (m))
    {
        fprintf(stderr, "The heap is empty\n");
```

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```
        exit(1);
    }
    item = heap[1];
    temp = heap[m--];
    parent = 1;
    child = 2;
    while (child <=m)
    {
        if (child<m) && (heap[child].key < heap[child+1].key)
        {
            child++;
        }
        if (temp.key >= heap[child].key)
        {
            break;
        }
        heap[parent] = heap[child];
        parent = child;
        child *=2;
    }
    heap[parent] = temp;
    return item;
}
```