國立成功大學 108 學年度碩士班招生考試試題

系　　所：資訊管理研究所

考試科目：計算機概論

考試日期：0224，節次：2

※ 考生請注意：本試題不可使用計算機。　請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

A.

A-1. Multiple choice questions:　(choose only ONE answer for a question; 3% for each question)

(1) Which of the following techniques is NOT used for the purpose of ensuring data confidentiality?

a. Steganography.　　b. Digital certificate.

c. Message digest.　　d. Digital watermark

e. Digital signature.

(2) Arthur receives an email from his bank asking him to update and verify his credit card details. He replies to the mail with all the requested details. Arthur later learns that the mail was not actually sent by his bank and that the information he had shared has been misused. Arthur is a victim of _____.

a. sniffing.　　b. hijacking.　　c. hacking

d. spoofing　　e. phishing

(3) _____ is a suite of software applications that integrates existing systems by providing layers of software that connect applications together. Although there is no centralized _____ database, _____ software keeps files of metadata that describe where data are located.

a. Customer Relationship Management (CRM)

b. Enterprise Application Integration (EAI)

c. Enterprise Resource Planning (ERP)

d. Business Process Management (BPM)

e. Decision Support System (DSS)

(4) A case of _____ occurs when a threat obtains data that is supposed to be protected.

a. Faulty service

b. Unauthorized data disclosure

c. Incorrect data modification

d. Unauthorized data blocking

e. Denial of service

(5) Because EDI transactions are business contracts and often involve large amounts of money, the existence of an independent audit log helps establish ____.

a. nonrepudiation

b. secrecy

c. privacy

d. confidentiality

e. integrity

(6) With https, data are encrypted using a protocol called the _____.

a. Post Office Protocol (POP)

b. Pretty Good Privacy (PGP)
c. Transport Layer Security (TLS)
d. Data Encryption Algorithm (DEA)
e. Secure Shell (SSH)

(7) In a table that has columns A, B, and C, there is a _____ of column B on column A if each value for column A is associated with a specific collection of values for B and this collection is independent of any values for C.
a. referential dependence
b. functional dependence
c. multivalued dependence
d. determination dependence
e. partial dependence

(8) In an information system for the U.S. National Football League (NFL), the relationship of a football team object instance to a particular player object instance would be called:
a. polymorphism.
b. composition.
c. generalization/specialization.
d. aggregation.
e. multiplicity.

A-2. Modeling and short-answer questions:

(1) Explain what an "*Adapter*" design pattern is and give an example using the format of a class diagram based on the Unified Modeling Language (UML) convention.
(10%)

(2) Briefly explain what the following two SQL statements do.
(a) SELECT DISTINCT(Client_ID) FROM Order; (3%)
(b) UPDATE Client SET Lastname = 'Hughs' WHERE Client_ID = '19362010';
COMMIT; (3%)
(c) INSERT INTO Small_Client
SELECT * FROM Client WHERE credit_limit <= 2000; (4%)

(3) In an IPv4 network, please specify the binary values of the network prefix, subnet ID, and host ID of the IP address of 140.210.53.213.
(6%)

B-1. (10%) A prime number is a positive integer greater than 1 that cannot be formed by multiplying two smaller positive integers. Please develop a C++ function that uses recursion to determine whether an input integer is a prime number or not. Note that this C++ function returns true if the input positive integer is a prime number, and false, otherwise.

B-2. (10%) Consider operator overloading in C++.

(a) (5%) Some operators must be declared as class members. Please name two operators of them, in addition to the assignment operators.

(b) (5%) Name two operators that cannot be overloaded.

B-3. (10%) Please explain the following two C++ declarations:

(a) (5%) `int (*a[3])(int);`

(b) (5%) `int (*b)[10];`

B-4. (20%) Consider the following C++ program that rolls an eight-sided dice 100 times. Assume that all preprocessor directives and using declarations required for this program have already been given.

```
1  int main()
2  {
3     int size = 7;
4     int freq[size] = {};
5     srand( time(0));
6
7     for( roll = 1; roll <= 100; roll++)
8        freq[ 1 + rand() % 7];
9
10    cout << "Dice Face" << setw(13) << "Frequency" << endl;
11
12    for( int face = 1; face < size; face++)
13       cout << setw(9) << face << setw(13) << freq[face] << endl;
14 }
```

(a) (10%) Some errors exist between Lines 2 and 11 in the above C++ program. Please identify each of them via the line number and make the corresponding correction. (No credit will be given if you modify the structure of the program.)

(b) (10%) You are now asked to roll two eight-sided dice 100 times and store the results in a 2D array with the first dimension indicating the face of the first dice and the second dimension indicating the face of the second dice. Please develop a C++ program based on the above program. (Assume again that all preprocessor directives and using declarations have been given.)