國立成功大學

110學年度碩士班招生考試試題

編　號：247

系　所：資訊管理研究所

科　目：計算機概論

日　期：0203

節　次：第 2 節

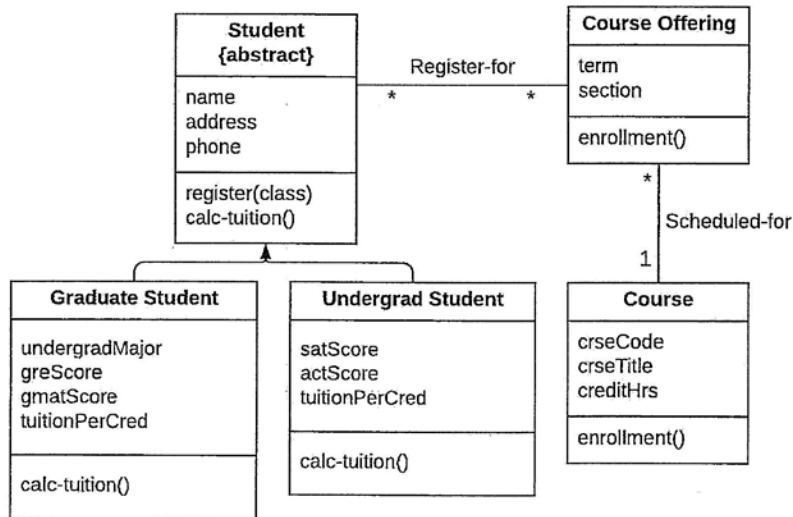備　註：不可使用計算機

※ 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-1 Multiple Choice Questions: (Choose only ONE answer for a question; 3% for each question)

(1) Which of the following protocol is used to translate an IP address to a MAC address? (A) DNS (B) ARP (C) DHCP (D) IP (E) PPP

(2) The type of database that is most capable of supporting complex data types is _____. (A) sequential files (B) relational DBMS (C) object-oriented DBMS (D) hierarchical DBMS (E) random access files

(3) A processor contains small, high-speed storage locations, called _____, whose functions include storing the location from where an instruction was fetched, storing instructions and data, etc. (A) cache (B) virtual memory (C) register (D) RAM (E) flash

(4) Public-key encryption is also known as _____. (A) open-key encryption (B) symmetric key encryption (C) two-key encryption (D) scrambled encryption (E) asymmetric key encryption

(5) The practice used by some ISPs that restricts or slow down a customer's Internet access when he or she has used all the allotted data amount is known as _____. (A) capping (B) throttling (C) Bluebugging (D) DoS attack (E) IP hijacking

(6) Two's complement is the way most modern computer represent integers. To get the two's complement of a number, simply invert every digits of the number and add 1. Based on this rule, what is the two's complement of 64? (A) 00100000 (B) 11011111 (C) 11100000 (D) 00011111 (E) 11110000

(7) A _____ provides a read-only, static view of a source database that is typically used for safeguarding data against errors, offloading reporting, etc. (A) schema (B) map (C) snapshot (D) page (E) transaction

(8) _____ is an Internet standard that enables a local-area network (LAN) to use one set of IP addresses for internal traffic and a second set of addresses for external traffic. (A) IPv6 (B) Firewall (C) Tunneling (D) NAT (E) SSH

(9) When an operating system stores data on a disk, it places that data in the first available _____. (A) buffer (B) cell (C) block (D) array (E) sector

(10) _____ is a region in a program's memory space that stores variables that can be accessed globally. This region does not have size restrictions on variable size. However, it must be used very carefully to prevent memory leaks. (A) Heap (B) Stack (C) Buffer (D) Virtual memory (E) Code page

A-2 Short Answer Questions: (20%)

(1) Convert all the class associations in the following class diagram to tables in RDBMS (Data types can be ignored) [10%]

(2) When designing software, particularly object-oriented programs, it is crucial to follow the law of Demeter and the principle of substitutability. Explain what they are and give an example for each. [10%]

※ 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。

B-1 (4%) A C++ function that prints a string via pointer arithmetic such as ++ptr to output each character has a parameter that is
(a) nonconstant pointer to nonconstant data.
(b) nonconstant pointer to constant data.
(c) constant pointer to nonconstant data.
(d) constant pointer to constant data.

B-2 (4%) Which of the following is not true when considering pointers to functions in C++?
(a) They can be stored in arrays.
(b) They are dereferenced in order to call the function.
(c) They contain the starting address of the function code.
(d) They cannot be assigned to other function pointers.

B-3 (4%) Which of the following operators can be overloaded as a global function in C++?
(a) == (b) += (c) [] (d) ()

B-4 (4%) Which of the following is not a kind of inheritance in C++?
(a) Public (b) private (c) static (d) protected

B-5 (4%) For a non-constant member function of class Test in C++, the this pointer has type
(a) Test * const (b) Test const * (c) const Test * (d) const Test * const

B-6 (10%) What will be the value of each of the following variables after its initialization in C++?

```
double d = 2 * int(3.14);
long k = 3.14 - 3;
char x = 'a' + 2;
char y = 'p' + 'A' - 'a';
```

B-7 (20%) Rewrite the following C++ function by using pointer arithmetic:

```
char* ReverseString(char *str)
{
    int len = strlen(str);
    char *result = new char[len + 1];
    for (register i = 0; i < len; ++i)
        result[i] = str[len - i - 1];
    result[len] = '\0';
    return result;
}
```