※注意：作答時，請於答案卷上標明作答之部份及其題號。

PART I: Multiple Choice (單選題) (30%)

Instructions: Select the letter of the correct answer for each of the following questions.

1. _____ is a technology that involves reading typewritten, computer-printed, or handwritten characters from ordinary documents and translating the images into a form that a computer can understand.
   a. Bar code scanning
   b. Optical character recognition (OCR)
   c. Optical mark recognition (OMR)
   d. Magnetic-ink character recognition (MICR)

2. A(n) _____ is an internal network that uses Internet technologies.
   a. extranet b. intranet c. wide-area network d. metropolitan network

3. _____ is an Internet standard that allows you to upload and download files to and from a Web server.
   a. FTP b. TCP/IP c. WAP d. PSTN

4. A display device that uses a separate transistor for each color pixel is a(n) _____.
   a. dual-scan display
   b. passive-matrix display
   c. terminal
   d. active-matrix display

5. A byte is informative because it provides enough different combinations of 0s and 1s to represent _____ individual characters.
   a. 64 b. 128 c. 256 d. 512

6. _____ is a process designed to make sure the data within the relations (tables) contains the least amount of duplication.
   a. Normalization b. Projection c. CGI d. Dimensioning

7. _____ are PC Cards used to add memory capabilities to a computer.
   a. Type I cards b. Type II cards c. Type III cards d. Type IV cards

8. Developed by Hewlett-Packard, a leading printer manufacturer, _____ is a standard printer language that supports the fonts and layouts used in standard office documents.
   a. ClearType
   b. PCL (Printer Control Language)
   c. PostScript
   d. DLP (Digital Language Printing)

9. In order, from less expensive to more expensive and from slower to faster, storage media are _____.
   a. floppy disk, compact disc, hard disk, tape
   b. compact disc, hard disk, tape, floppy disk
   c. hard disk, tape, floppy disk, compact disc
   d. tape, floppy disk, compact disc, hard disk

10. A 48X CD-ROM drive has a data transfer rate of _____.
    a. 48 (48 x 1) KB per second or .04 MB per second
    b. 2,400 (48 x 50) KB per second or 2.4 MB per second
    c. 4,800 (48 x 100) KB per second or 4.8 MB per second
    d. 7,200 (48 x 150) KB per second or 7.2 MB per second

11. _____ is a feature of Windows 2000 Server that allows network administrators to manage all network information including users, devices, settings, and connections from a central environment.
    a. Plug and Play (PP)
    b. File Allocation Table (FAT)
    c. Active Directory (AD)
    d. Graphical User Interface (GUI)

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12. _____ is any of several types of digital lines that carry multiple signals over a single communications line.
    a. CATV (cable television line)
    b. ISDN (Integrated Services Digital Network)
    c. T-carrier line
    d. Asynchronous transfer mode (ATM)

13. A company that manufacturers bicycles and uses the Internet to purchase tires from their supplier is engaging in _____ e-commerce.
    a. B2B b. B2E c. C2C d. B2C

14. A _____ port can support up to 127 different devices.
    a. serial b. parallel c. SCSI d. USB

15. The program development life cycle (PDLC) consists of six steps: _____.
    a. analyze problem, design programs, code programs, support programs, formalize solution, maintain programs
    b. plan problem, design programs, code programs, test programs, formalize solution, maintain programs
    c. analyze problem, design programs, code programs, test programs, formalize solution, implement programs
    d. analyze problem, design programs, code programs, test programs, formalize solution, maintain programs

PART II: Matching (配對) (10%)

Instructions: Match each term from the column on the left with the best description from the column on the right.

_____	1. relational database	a. The process of comparing data to a set of rules or values to find out if the data is correct.
_____	2. database approach	b. Verifies the accuracy of a primary key.
_____	3. validity check	c. Process that provides for many programs and users to share the data in the database.
_____	4. data dictionary	d. Contains data about each file in the database.
_____	5. query	e. A value that the DBMS initially displays in a field.
		f. A request for specific data from the database.
		g. Stores data in tables that consist of rows and columns.

PART III: Questions and Answers (問答題) (30%)

Instructions: Write a brief but complete answer to each of the following questions.

1. List 3 types of data you can enter into a cell in a spreadsheet program. (6%)

2. Explain the following terms in details. (16%)
    a. Web services
    b. UML (Unified Modeling Language)
    c. e-Commerce vs. e-Business
    d. Rule-based reasoning vs. case-based reasoning in an expert system

3. Please write a computer purchase specification (採購規格) for a business office in which the computers are mainly used for document processing. You should consider both the hardware and software aspects for the purchase. (8%)

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PART IV: Computer Programming (程式寫作) (30%)

1. Determine the outputs of the following C++ program: (15%)

```
#include <iostream>
using namespace std;

class A {
public:
    A() {i_=0; cout << "A::A()" << endl;}
    A(int i) {i_=i; cout << "A::A(int)" << endl;}
    A(const A& a) {i_=a.i_; cout << "A::A(const A&)" << endl;}
    virtual ~A() {}
    A& operator= (const A& a)
            {cout << "A::operator=" << endl; return *this;}
    virtual void fun(int i=0)
            {i_=i; cout << "A::fun(int)" << endl;}
protected:
    int i_;
};

A fun(A& x, A y) {
    y = x;
    return y;
}

void main() {
    cout << "LABEL 1" << endl;
    A a(4), b;

    cout << "LABEL 2" << endl;
    A *x = &b;
    A r = a;
    a = 8;

    cout << "LABEL 3" << endl;
    x->fun(200);
    r = fun(a, b);
}
```

2. A famous number sequence is the Fibonacci sequence 1, 1, 2, 3, 5, 8, 13, 21, …, in which each element (beyond the first and second) is the sum of the previous two elements. Use your favorite programming language to write a program that inputs a positive integer, *n*, then outputs the smallest Fibonacci number that exceeds *n* and its position in the Fibonacci sequence. (15%)

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