科目：計算機概論　　　　　　系所組：統資系應統碩

A. Multiple Choice Questions (單選題): (60%)

1. Data _____ identifies the quality of data in a database.
   a. dimension
   b. access
   c. resolution
   d. integrity
   e. none of the above

2. Compared with relational databases, object-oriented databases _____.
   a. allow programmers to reuse objects
   b. access data faster
   c. can store more types of data
   d. offer better security
   e. all of the above

3. A(n) _____ digit is a number(s) or character(s) that is appended to or inserted into a primary key field.
   a. check
   b. insertion
   c. index
   d. integer
   e. correction

4. _____ is a process designed to ensure the data within the relations (tables) contains the least amount of duplication.
   a. Dithering
   b. Concentration
   c. Condensation
   d. Rationalization
   e. Normalization

5. Google Docs is a cloud storage provider for all of the following EXCEPT _____.
   a. spreadsheets
   b. e-mail messages
   c. presentations
   d. documents
   e. none of the above

6. A data _____ is a huge database that stores and manages the data required to analyze historical and current transactions.
   a. stockhouse
   b. outlet
   c. center
   d. warehouse
   e. storage

7. In a relational database, each row _____.
   a. and each column has a primary key
   b. has a primary ,key and each column has a unique name
   c. has a unique name and each column has a primary key
   d. and each column has a unique name
   e. all of the above

8. Data mining is NOT suitable to deal with which of the following situations?
   a. natural language analysis
   b. weather forecast
   c. shopping pattern
   d. financial investment decision
   e. none of the above

9. In E-R models, attributes illustrated in double ovals are known as _____.
   a. simple attributes
   b. key attributes

※ 注意：1.考生須在「彌封答案卷」上作答。
　　　　2.本試題紙空白部份可當稿紙使用。
　　　　3.考生於作答時可否使用計算機、法典、字典或其他資料或工具，以簡章之規定為準。

c. derived attributes

d. multivalued attributes

e. none of the above

10. The services provided by famous Chinese website of Alibaba Group (www.1688.com) belongs to which of the following model?

a. B2C

b. B2B

c. C2C

d. B2G

e. all of the above

11. How many "hello"s will be printed after the following JAVA code is executed?

```java
for(int i=0; i<5-1; i++)
    for(int j=i+1; j<5; j++)
        System.out.println("hello");
```

a. 8

b. 9

c. 10

d. 11

e. 12

12. Which of the following operating systems does not have 64bit version?

a. Mac OS X 10.5

b. Windows XP home

c. Windows 2000

d. Ubuntu 8.10

e. none of the above

13. All of the following are true of a wireless network EXCEPT:

a. computers at the nodes can run different operating systems.

b. less trouble to install.

c. convenient for users that work in many locations.

d. generally faster than wired LAN.

e. easier to be compromised by eavesdroppers.

14. Which of the following notions is adopted by customer service department in many businesses to raise satisfaction and productivity?

a. Computer Telephony Integration

b. Business Process Reengineering

c. Database Management System

d. Network Operating System

e. all of the above

15. _____ provides decision support by enabling managers to import rich and up-to-minute data from databases.

a. Demographic Information System

b. Export System

c. Executive Information System

d. Decision Support System

e. Online Analytical Processing

16. Children of the same node of a rooted tree are called _____.

a. the leaves

b. the parents

c. the non-terminals

d. the descendents

e. the siblings

17. Some DBMSs maintain a(n) _____, which is a lising of activities that change the contents of a database.

a. recovery utility

b. roll-back image

c. registry

d. backup plan

e. log

18. In general, a _____ is a set of coordinated tasks and activities,

conducted by both people and equipment, that will lead to accomplishing a specific organizational goal.

a. business framework
b. standard operating procedure
c. business process
d. job flow
e. none of the above

19. _____ uses a variety of techniques to find hidden patterns and relationships in large pools of data and infer rules from them that can be used to guide decision making.

a. Data visualization
b. OLAP
c. Data spoofing
d. Drill down
e. none of the above

20. An offline backup, also called an _____, is a database backup when the database is offline and thus not accessible for updating.

a. hot backup
b. hard copy
c. image
d. cold backup
e. mirror copy

B. Essay Questions (問答題):

1. (10%) The Fibonacci numbers are the numbers in the following integer sequence: 1, 1, 2, 3, 5, 8, 13, 21, 34,… The seed values $F(1)=1$, $F(2)=1$ and the recurrence relations is $F(n)=F(n-1)+F(n-2)$ for $n>=2$.
Please write necessary codes (in any computer language) to print the Fibonacci numbers from $F(1)$ to $F(30)$.

2. (5%) (a) Convert the infix expression *(A+B)/(C-D)*E+F/G* to postfix expression.
(5%) (b) Draw a binary tree whose inorder traversal is the same expression in last question.

3. Consider the following descriptions for a database UNIVERSITY:
"A university consists of a number of departments. Each department offers several courses. A number of modules make up each course. Students enroll in a particular course and take modules towards the completion of that course. Each module is taught by a lecturer from the appropriate department, and each lecturer tutors a group of students."
(7%) (a) Draw an ER (Entity-Relationship) schema diagram for the above scenario. You need to clearly indicate the cardinality ratio (1:1, 1:N, or M:N) and participation constraints (total or partial) for each relationship. State clearly any additional assumptions you make.
(7%) (b) Map the ER schema into the corresponding relational database schema diagram. Specify all the primary keys and foreign keys.

4. (6%) What is CRISP-DM? Give your definition and explain how it works.