

國立中央大學99學年度碩士班考試入學試題卷

所別：資訊管理學系碩士班 甲組(一般生) 科目：計算機概論 共 5 頁 第 1 頁

乙組(一般生)

*請在試卷答案卷(卡)內作答

丙組(一般生)

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- 一、請在下列各小題內，選擇正確、最接近或最合適答案之選項號碼A, B, C, D寫入答案卷。(注意事項：作答時必須以適當間隔，依序標明每小題之題號，然後在題號之後填寫答案；答案所填之選項號碼，請如同試題用大寫A, B, C, D。未依注意事項作答造成答案無法確認，將予扣分或不予計分。)(每小題 2%)
- 1.1 Most DBMSs support the creation of views. Which one of the following is incorrect? (A) Because each user has his or her own view, different users can view the same data in different ways. (B) Views can not provide data independence. (C) Views provide a measure of security. (D) A view is an application program's or an individual user's picture of the database.
 - 1.2 Referring to functional dependence in database, which one of the following is incorrect? (A) One can determine functional dependence by looking at sample data. (B) Assume the values for column A in the B relation are unique. Thus, all the other columns in the B relation are functionally dependent on A. (C) Understanding functional dependence is crucial to learning normalization. (D) A column B is functionally dependent on another column A if each value for A in the database is associated with exactly one value of B.
 - 1.3 To implement a relationship in the ER (Entity Relationship) model, _____ of one entity appears as a foreign key in the related entity. (A) the derived attribute (B) the primary key (C) the secondary key (D) the related participant
 - 1.4 Which one of the following is the advantage of the database with controlled redundancy? (A) Consistency (B) Independence (C) Integrity (D) Encapsulation
 - 1.5 In a rollback, also called backward recovery, the DBMS uses the log to _____ any changes made to the database during a certain period. (A) backup (B) reenter (C) undo (D) modify
 - 1.6 In the design of a relational database, the normalization process enables you to identify the existence of what potential problems? (A) concatenation (B) illegal determinants (C) incorrect decomposition (D) update anomalies
 - 1.7 Which one of the following is a process-centered technique that is used to model business requirements for a system? (A) Structured analysis (B) Prototyping (C) Information engineering (D) object oriented analysis
 - 1.8 The design strategy of rapid application development (RAD) calls for the interactive use of _____ and _____ to define the users' requirements and design the final system. (A) 3rd GL and 4GL (B) structured techniques and prototyping (C) UML and prototyping (D) DFD and ERD
 - 1.9 Which one of the following is incorrect referring to object-oriented analysis and design? (A) Object technologies are an attempt to eliminate the separation of concerns about data and process. (B) Object modeling is a technique for identifying objects within the systems environment and the relationships

參考用

注意：背面有試題

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between those objects. (C) The UML prescribe a method for developing systems. (D) The object-oriented approach to system development is based on the concept that objects exist within a system' s environment.

1.10 What is the technique wherein the attributes and behaviors that are common to several types of object classes are grouped into their own class? (A) Encapsulation (B) Object modeling (C) Aggregation (D) Generalization

1.11 Which one of the following is a model-based technique wherein standard parameters based on prior projects are applied to the new project to estimate duration of a project and its tasks. (A) GANTT (B) PERT (C) COCOMO (D) WBS

1.12 Referring to physical data flow diagram (physical DFD) in systems analysis and design, which one of the following is incorrect? (A) In structured analysis and design, physical DFDs of the target system are intended to propose and model technology choices and design decisions for all logical processes, data flows, and data stores. (B) Physical DFDs serve as a technical blueprint for system construction and implementation. (C) Physical DFD is the primary tool used to develop the application architecture for the information system. (D) Systems analysts draw physical DFD to model the system' s raw data before they draw the data flow diagrams that illustrate how that data will be captured, stored, used, and maintained.

二、試分別為下列各項提出一樣應用，並說明理由。回答請簡單扼要。(每小題 2%)

- 2.1 Decision trees
- 2.2 K-means algorithms
- 2.3 Binary trees
- 2.4 Hash maps
- 2.5 Switched virtual circuit (SVC)
- 2.6 Sliding window
- 2.7 Mesh topology
- 2.8 Acknowledgement (ACK)
- 2.9 Cloud computing
- 2.10 Petri net
- 2.11 Minimum-cost spanning trees
- 2.12 Divide-and-conquer algorithms
- 2.13 Priority queues

三、為何電腦的記憶體空間要區分為核心記憶體(kernel memory)和使用者記憶體(user memory)? (5%)

CPU要如何在這兩種空間中切換? (5%)

四、何謂虛擬機器(virtual machine)? (5%)

虛擬機器可以分成那些種類? (5%)

為何近年來虛擬機器技術在資訊界又受到很大的重視? (5%)

注意：背面有試題

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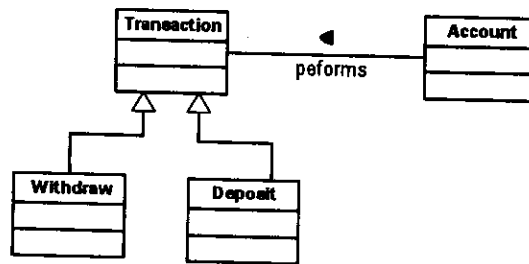
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五、某銀行運用了Java及物件導向程式設計開發一個帳號管理(Account Management)系統(簡稱為AM系統)。單純起見，假設AM系統可供操作的交易(Transaction)僅有存款(Deposit)及提款(Withdraw)兩種。由於某種原因，系統將交易物件化。當客戶欲進行上述之任一交易時，系統會根據所指定的交易類別產生(即具體化)一個相關的交易物件。客戶可連續操作上述的交易功能，此時即連續產生多個交易物件。為了方便查察，這些交易物件會保留在系統中，系統並有一計數器來記錄目前所產生的交易物件的數量。以下為上述的操作情節所分析出來的簡化之類別圖(class diagram)。



程式設計理念

1. 運用 static variable來設計上述的交易物件計數器
2. 在Demo.class中針對Transaction及其子類別及amendBalance方法運用polymorphism及dynamic method binding
3. Transaction與Deposit及Withdraw運用繼承概念，以搭配polymorphism的設計

請依上述的情節範圍、類別圖、和設計理念，完成下面的十處程式碼。並在答案卷上依編號、工整地列出這十項程式答案。

注意：程式中的各種宣告已足夠使用。為能展現本題所欲測試的概念，請勿再定義或宣告其他類別、方法或變數，否則將影響分數的給定。

```

public class Account{
    private int balance; //帳號存款餘額;
    private String name; //存戶姓名
    private String AccNO; //帳號

    public Account(int balance, String name, String AccNO){

```

(1) 完成本建構程式(constructor) (3%)

```

    }

    public String getName(){
        return name; }
    public void setBalance(int balance){
        this.balance = balance; }
    public int getBalance(){

```

參考用

注意：背面有試題

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```
return balance; }  
}
```

```
public _____ (2) _____ {
```

(2) 完成Transaction類別頭的部分 (2%)

```
private Account a;
```

(3) 在此宣告一個static variable "counter" (2%)

```
public Transaction(Account a){  
    this.a = a;
```

(4) 完成本(Transaction)建構程式 (2%)

```
}
```

(5) 完成本(Transaction)類別 (3%)

```
public class Deposit extends Transaction{
```

```
private Account a;
```

```
public Deposit(Account a){
```

```
    super(a);
```

```
    this.a = a;
```

```
}
```

```
public void amendBalance(int amount){
```

```
//本方法是用來改變帳號的金額
```

(6) 完成本方法(amendBalance)的內容 (1.5%)

```
}
```

```
public class Withdraw extends Transaction{
```

```
private Account a;
```

```
public Withdraw(Account a){
```

```
    super(a);
```

```
    this.a = a;}
```

```
public void amendBalance(int amount){
```

(7) 完成本方法(amendBalance)的內容 (1.5%)

```
}
```

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```
)

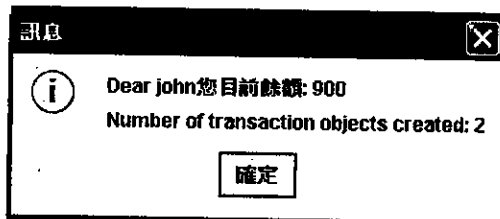
import javax.swing.*;
public class Demo {
    public static void main (String args []){
        Account a = new Account(1000, "john", "8923345");
        Transaction t = null;
        int r1, r2;

        do {
            r1 = Integer.parseInt(JOptionPane.showInputDialog("請輸入交易型態: (1) deposit,
(2) withdraw"));

            switch (r1){
                (8) 完成switch內容。特別是依不同的選項來產生相對的交易物件。本
                處須運用polymorphism概念 (4%)
            }

            r2 = Integer.parseInt(JOptionPane.showInputDialog("輸入交易金額:"));
            (9) 呼叫某方法並運用dynamic method binding概念來進行
            交易金額的加減及帳號餘額的更新 (2%)
        } while (JOptionPane.showConfirmDialog(null, "Another transaction?") == 0);

        JOptionPane.showMessageDialog(null, (10) );
        (10) 完成showMessageDialog參數內容以產生如下對話方塊 (4%)
    }
}
```



參考用