UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2009/2010

SUBJECT NAME	:	OBJECT ORIENTED PROGRAMMING
SUBJECT CODE	:	BIT 2063
COURSE	:	2 BIT
EXAMINATION DATE	:	APRIL/MAY 2010
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTION.

THIS PAPER CONTAINS THIRTEEN (13) PAGES

SECTION A

Instruction: Answer **ALL** questions.

Q1 Give definition for the following terms:

(a) Object

(b) Encapsulation

(c) Inheritance

(d) Polymorphism

(e) Message

(10 marks)

Q2. Fix the errors in the following program.

(a)
```
void Pixel :: operator+(Pixel &p1, Pixel &p2, int a)
{
   p1.x=p1.x+a;
   p1.y=p1.y+a;
   p2.x=p2.x+a;
   p2.y=p2.y+a;
   cout << p1.x <<" , "<< p1.y;
   cout << p2.x <<" , "<< p2.y;
}
```

(b)
```
class Stat {
    static float total;
    float x;
  public:
    Stat(float y) {x=y;}
    static void add();
  };
static void Stat:add()
{
    total +=x;
}
```

(c)
```
fstream myfile("info.dat");
if(myfile)
{
    cout<< "Error in file opening.";
    exit(1);
}
```

(d)
```
float x=1.99;
int &ref = x;
cout << ref;
```

(10 marks)

Q3. State the output produces by the following program.

(a)
```
class Pixel {
    int x,y;
 public:
   Pixel() {x=1; y=0;}
   ~Pixel() {cout<<"Pixel "<<x<<','<<y<<"is deleted.";}
};
int main() {
   Pixel pix;
   return 0;        }
```

(b)
```
class Tiks {
private :
    int x,y;
public:
  Tiks() {x=7; y=9;}
  ~Tiks() {cout<<"Object "<<x<<','<<y<<"is deleted.";}
};
int main() {
  Tiks tx;
  cout <<"value of x is" << tx.x << "while y is" <<tx.y;
       return 0;        }
```

(c)
```
class First{
    protected: int x;
    public : First(int a) {x=a;}
             virtual void display() {cout<<x ;}
};
class Second{
    public : Second (int a): First(a) {}
    void display() {cout << hex << x; }
};
int main() {
    First *pt, obj1(13);
    Second obj2(15);
    pt=&obj1;
    pt->display();
    pt=&obj2;
    pt->display();
    return 0;
}
```

(d)
```
void f() {throw 1;}

int main()
{
 try{  f();
   } catch(int) {cout << "tangkap dia.";}
 return 0;
}
```

(10 marks)

Q4. State **TWO (2)** differences between debungging and testing.

(5 marks)

Q5. Based on **Figure Q5**, create Test Plan with at least **FOUR (4)** Test Cases.

```
#include<iostream.h>
class circuit{
      float res, vol;
      void set(float r, float v);
      float current();
};

void Set(float r, float v)
{
      res=r, vol=v;
}

float current()
{
      return vol/res;
}

int main(){
      float r,v;
      Cicuit crc;
      cout << "Masukkan rintangan :";
      cin >> r;
      cout << "Masukkan voltan :";
      cin >> v;
      crc.set();
      cout << "Arus ialah " <<current()<< "A";
      return 0;
}
```

FIGURE Q5

(10 marks)

Q6. **Figure Q6** is a Class Diagram which shows inheritance concept.

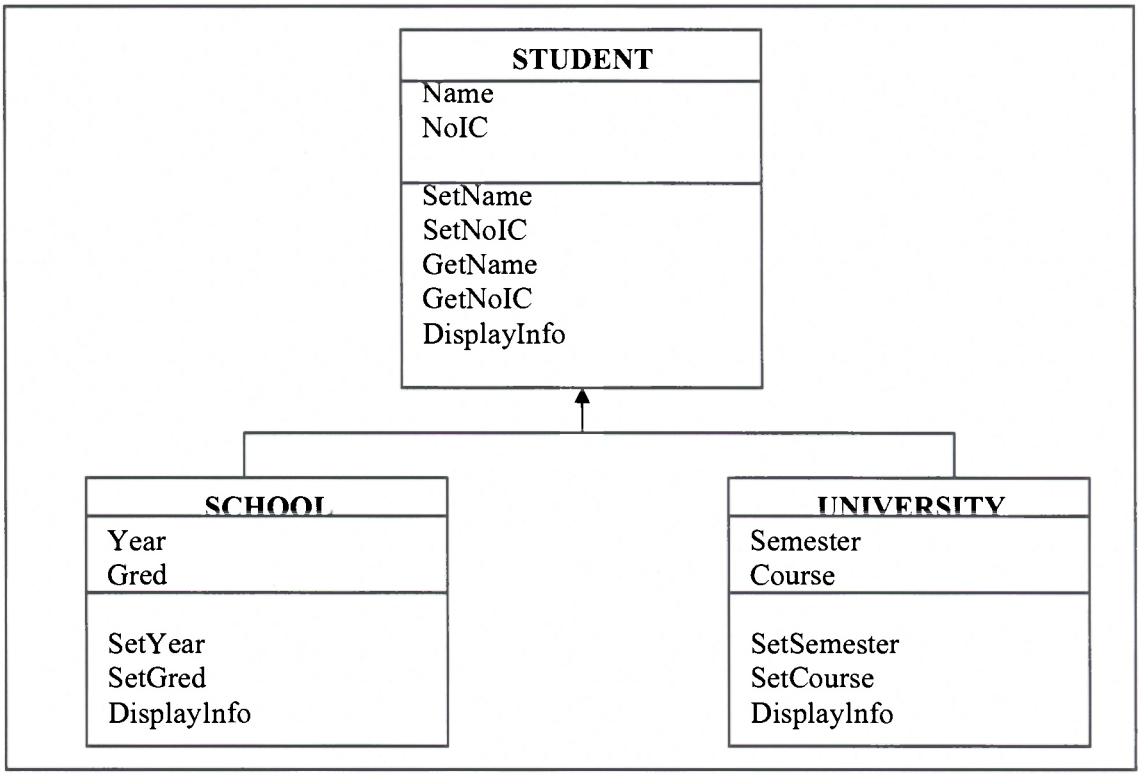


Figure Q6

(a) Based on **Figure Q6**, develop class School definition.

(5 marks)

(b) Implement `DisplayInfo method` in University class which will inherit attribute of Student class.

(5 marks)

(c) Based on **Figure Q6**, implement main function to view all the data in each class using polymorphism concept.

(5 marks)

SECTION B

Instruction: Answer **ONE** question only.

Q7 You have been asked to implement a simple class based on the requirements as in **Figure Q7**.

Name	**:**	**Abu Bin Ali**
Age	**:**	**28**
Date of Birth	**:**	**10 Ogos 1982**
Name	**:**	**Ahmad Bin Ali**
Age	**:**	**26**
Date of Birth	**:**	**16 Mac 1984**
Name	**:**	**Alisa Bin Ali**
Age	**:**	**24**
Date of Birth	**:**	**25 Jun 1986**

FIGURE Q7: AbuSiblings.dat

Figure Q7 shows the information of Abu's siblings. The information is stored inside a file *AbuSibling.dat*.

You are required to implement a class AbuSibling that contains his sibling information. Your class should be able to allow data key-in from the keyboard and is stored inside a file. The data then can be printed to the screen from the specified file.

Based on the above requirements, answer the following questions:

(a) Identify the attributes and method that you need to implement based on the information given. Then produce the class diagram for AbuSiblings class.
(5 marks)

(b) Use the **struct** mechanism to declare the attributes that have been identified in **Q7(a)**.
(10 marks)

(c) Write a program for the class AbuSiblings by applying **file processing** technique.
(20 marks)

(a) Implement the driver (main) that will instantiate the object and send the message.
(5 marks)

Q8 You have been asked to implement a simple class based on the requirements as stated below.

A dive shop maintains the inventory of dive equipments that are being sold at the shop. The list includes details such as item's name, brand and number of stock. Whenever the new equipments arrive, the manager of the dive shop will enters the details into system.

(a) Draw a UML diagram of class Dive

(5 marks)

(b) Implement the class Dive using C++ programming language that allowed you to read the data/input of dive equipment details from a file and write the output to a file. The output printed on the screen should be as follow :

```
Please enter the item's name : Wetsuit
Please enter the item's brand :  Mares
Please enter the number of stock : 5

     Item            Brand        Stock Number
   Wetsuit           Mares               5
```

(30 marks)

(c) Implement the driver (main) that will instantiate the object and send the message.

(5 marks)

(End of Question)

BAHAGIAN A

ARAHAN : Jawab SEMUA soalan.

S1. Beri definisi untuk terma terma berikut:

(a) Object
(b) Encapsulation
(c) Inheritance
(d) Polymorphism
(e) Message

(10 markah)

S2. Diberi keratan program, kenalpasti baris dan kesilapan yang wujud.

(a)
```
void Pixel :: operator+(Pixel &p1, Pixel &p2, int a)
{
    p1.x=p1.x+a;
    p1.y=p1.y+a;
    p2.x=p2.x+a;
    p2.y=p2.y+a;
    cout << p1.x <<" , "<< p1.y;
    cout << p2.x <<" , "<< p2.y;
 }
```

(b)
```
class Stat {
    static float total;
    float x;
  public:
    Stat(float y) {x=y;}
    static void add();
   };
static void Stat:add()
{
    total +=x;
}
```

(c)
```
fstream myfile("info.dat");
if(myfile)
{
    cout<< "Error in file opening.";
    exit(1);
}
```

d)
```
float x=1.99;
int &ref = x;
cout << ref;
```

(10 markah)

S3. Diberi keratan aturcara, nyatakan output.

(f)
```
class Pixel {
    int x,y;
public:
   Pixel() {x=1; y=0;}
   ~Pixel() {cout<<"Pixel "<<x<<','<<y<<"is deleted.";}
};
int main() {
   Pixel pix;
   return 0;        }
```

(g)
```
class Tiks {
private :
    int x,y;
public:
  Tiks() {x=7; y=9;}
  ~Tiks() {cout<<"Object "<<x<<','<<y<<"is deleted.";}
};
int main() {
  Tiks tx;
  cout <<"value of x is" << tx.x << "while y is" <<tx.y;
       return 0;        }
```

(c)
```
class First{
    protected: int x;
    public : First(int a) {x=a;}
             virtual void display() {cout<<x ;}
};
class Second{
    public : Second (int a): First(a) {}
    void display() {cout << hex << x; }
};
int main() {
    First *pt, obj1(13);
    Second obj2(15);
    pt=&obj1;
    pt->display();
    pt=&obj2;
    pt->display();
    return 0;
}
```

(d)
```
void f() {throw 1;}

int main()
{
 try{  f();
   } catch(int) {cout << "tangkap dia.";}
 return 0;
}
```

(10 markah)

S4. Berikan **DUA (2)** perbezaan diantara *debungging* dan *testing*.

(5 markah)

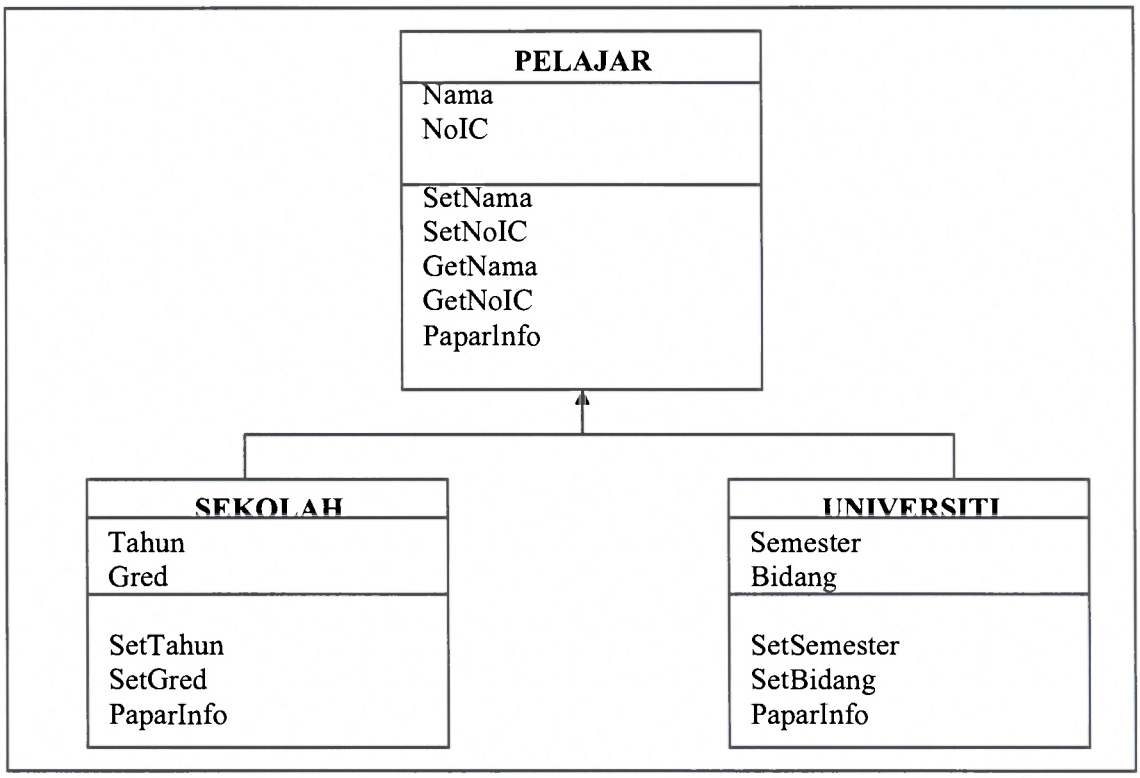
S5. Berpandukan **Rajah S5**, bina Plan Uji dengan sekurang-kurangnya **EMPAT (4)** Kes Uji.

```
#include<iostream.h>
class circuit{
      float res, vol;
      void set(float r, float v);
      float current();
};

void Set(float r, float v)
{
      res=r, vol=v;
}

float current()
{
      return vol/res;
}

int main(){
      float r,v;
      Cicuit crc;
      cout << "Masukkan rintangan :";
      cin >> r;
      cout << "Masukkan voltan :";
      cin >> v;
      crc.set();
      cout << "Arus ialah " <<current()<< "A";
      return 0;
}
```

Gambarajah S1

(10 markah)

S6. **Rajah S6** merupakan Rajah Kelas yang menunjukkan konsep perwarisan.



Rajah S6

a) Bina definisi class Sekolah berdasarkan **Rajah S6** diatas.

(5 markah)

b) Implementasikan fungsi PaparInfo bagi class Universiti di mana semua attribute class Pelajar dikeluarkan bersama-sama.

(5 markah)

c) Implementasikan fungsi `main` untuk memaparkan data bagi setiap kelas tersebut menggunakan konsep polymorphism.

(5 markah)

BAHAGIAN B

ARAHAN : Jawab **SATU** soalan sahaja.

S7. Anda diminta membangunkan kelas berdasarkan maklumat didalam **Rajah S7**.

Name	:	**Abu Bin Ali**
Age	:	**28**
Date of Birth	:	**10 Ogos 1982**
Name	:	**Ahmad Bin Ali**
Age	:	**26**
Date of Birth	:	**16 Mac 1984**
Name	:	**Alisa Bin Ali**
Age	:	**24**
Date of Birth	:	**25 Jun 1986**

Rajah S7: AbuSiblings.dat

Rajah S7 menunjukkan maklumat berkenaan dengan adik beradik Abu. Maklumat ini disimpan didalam fail *AbuSibling.dat*.

Anda diminta membangunkan kelas AbuSibling yang mengandungi maklumat adik beradiknya. Kelas anda mampu menerima data daripada skrin dan menyimpannya didalam fail. Data tersebut kemudian dipaparkan semula di skein daripada fail tersebut.

Berdasarkan keperluan tersebut, jawab semua soalan berikut:

(a) Kenalpasti atribut dan metod yang diperlukan untuk membina kelas tersebut. Kemudian hasilkan rajah Kelas AbuSiblings.

(5 markah)

(b) Dengan menggunakan mekanisma **struct** isytihar attibut yang dkenalpasti didalam **S7(a)**.

(10 markah)

(c) Bangunkan program untuk kelas AbuSiblings dengan menggunakan teknik pemprosesan fail.

(20 markah)

(d) Bina main(driver) yang akan mencipta objek dan menghantar mesej.

(5 markah)

S8 Anda diminta untuk membangunkan satu kelas berdasarkan keperluan berikut:

A dive shop maintains the inventory of dive equipments that are being sold at the shop. The list includes details such as item's name, brand and number of stock. Whenever the new equipments arrive, the manager of the dive shop will enters the details into system.

(a) Lukiskan rajah UML bagi kelas Dive.

(5 markah)

(b) Bangunkan kelas Dive menggunakan bahasa pengaturcaraan C++ yang membenarkan data/input bagi perincian peralatan menyelam dibaca dari fail dan ditulis kepada fail. Ouput perlu dicetak di skrin seperti berikut :

```
Please enter the item's name : Wetsuit
Please enter the item's brand :  Mares
Please enter the number of stock : 5

     Item            Brand        Stock Number
   Wetsuit           Mares               5
```

(30 markah)

(c) Bina main (driver) yang akan mencipta objek dan menghantar mesej.

(5 markah)

(Soalan Tamat)