UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION

SEMESTER II

SESSION 2010/2011

COURSE NAME	:	OBJECT-ORIENTED PROGRAMMING
COURSE CODE	:	BIT2063/BIT20603
PROGRAMME	:	BACHELOR OF INFORMATION TECHNOLOGY
EXAMINATION DATE	:	APRIL/MAY 2011
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS.

THIS QUESTION PAPER CONSISTS OF TWELVE (12) PAGES

SECTION A

Q1 The keyword `const` is used to:

(a) Specify an object is not modifiable and any attempt to change the object will produce a run-time error
(b) Specify an object is not modifiable and any attempt to change the object will produce a syntax error
(c) Specify an object is not modifiable and any attempt to change the object will produce a logical error
(d) None of the above

Q2 Anytime memory may be returned manually to the system using a `delete` command. However with classes, it is often useful to do this in _____.

(a) this pointer
(b) constructor method
(c) destructor method
(d) None of the above

Q3 Friend function is a function that is not a member of a class but it can access to _____.

(a) class's private and protected members
(b) class's public and protected members
(c) class's private, class's public and protected members
(d) None of the above

Q4 Sometimes a single value for data member applies to all object of class. In this case it would be inefficient to store the same value in every object of the class. This can be avoided by using:

(a) Protected data members
(b) Static data members
(c) Private data members
(d) None of the above

Q5 There is always a conflict to using abstraction and encapsulation. Many authors consider both as same. A better definition of abstraction might be _____.

(a) representing the essential feature of something without including or disturbing background or inessential part or detail
(b) to hide everything from the outside world/object that no other objects need ever be aware of the internal structure
(c) refer to the ability to use the same symbol to different purposes
(d) None of the above

Q6 The compiler uses the `this` pointer in order to _____.

(a) internally refer to the data members of a particular object
(b) allow the user to create new data types
(c) return dynamically allocated memory to the operating system
(d) None of the above

Q7 Inheritance of a base class with visibility mode private by a derived class, cause public members of the base class to become _____ members of the derived class and the _____ members of the base class become private members of the derived class.

(a) private, protected
(b) public, private
(c) protected, private
(d) None of the above

Q8 What is the syntax of declaring a derived class?

(a) **class** DerivedClass : BaseClass [visibility mode]
(b) **class** DerivedClass : [visibility mode] BaseClass
(c) **class** BaseClass : [visibility mode] DerivedClass
(d) None of the above

Q9 Which of the following is the action performed for `seekg( )`?

(a) Return the current position of the get pointer
(b) Move get file to a specific location
(c) Seek from end of file
(d) None of the above

Q10 What is the advantage of file processing?

(a) It reads the data from file and writes it to the screen until the end of file is reached
(b) We can accept input from keyboard and print output to screen
(c) If we run the program again and try to key-in another input data, the compiler adds the input data with the existing data from the file. The data inside a file is not deleted
(d) None of the above

Q11 What is a virtual function?

(a) A member function of a class, whose functionality can be over-ridden in its derived class
(b) An overloading method of a base class only.
(c) A function that is abstract in the implementation
(d) None of the above

Q12 Which statement show overloading concept?

(a) A=B*E;
(b) A*=c;
(c) A.`operator`*(c);
(d) A.*c;

Q13 When is an object memory allocated to a class?

(a) Compile
(b) Runtime
(c) Writing
(d) Linking

Q14 What is the main purpose of using operator overloading?

a) Easier method invocation in arithmetic way.
b) A few methods with the same name are declared for different semantic.
c) Ability to tell the compiler how to perform a certain operation when its corresponding operator is used on one or more variables
d) A few arguments to be used.

Q15 When does a polymorphism perform its task?

(a) Class definition
(b) Class implementation
(c) Main Function
(d) Super and Derived class definition/implementation

Q16 Which control statement is used during polymorphism?

(a) If...else
(b) Switch..case
(c) While
(d) Break

Q17 What is the main difference between procedure oriented language and object oriented language?

(a) Reuse
(b) Inheritance between two and more class
(c) Type checking
(d) None of the above

Q18 What is the purpose of the main method?
(a) To build a user interface.
(b) To hold the APIs of the application.
(c) To create buttons and scrollbars.
(d) To act as the entry point for the program.

Q19 Test cases are purposely for :

(a) function that detects an error where it cannot deal with it
(b) finding and fixing the errors with a test plan
(c) using `try` and `catch` function only.
(d) using `throw` function

Q20 A member function _____.

(a) Is always public
(b) Is always private
(c) Can be public or private
(d) Cannot be defined

(20 marks)

SECTION B

Q21 Provide definition for the following terms:

(a) Class

(b) Test Case

(c) Static Variable

(6 marks)

Q22 Derive the output for the program below?

```
#include <iostream.h>

class Even{
      public:
            int Display( );
}

int Even : : Display( )
{
      int i;
      cout<<"\nFirst 10 even integers are: ";

      for(i=2; i<20; i+=2)
      {
            cout<<i;
            cout<<" ";
      }
      return i;
};


#include "Even.cpp"

int main( )
{
      Even e;
      e.Display();
      return 0;
};
```

(4 marks)

Q23 In each of the following, discuss **TWO (2)** differences :

(a) between Black Box Testing and White Box Testing.

(5 marks)

(b) between Testing and Debugging

(5 marks)

Q24 Find an error in the program (if any) and state your reason.

```
class New : public Base  //derived class New publicly declared
{
      private:
            int PrivateOfNew;
      protected:
            int ProtectOfNew;
      public:
            int PublicOfNew;
            int NewFunction( )
            {
                  int a;
                  a = PrivateOfBase;
                  a= GetBaseOfPrivate( );
                  //inherited member accesses private data
                  a=ProtectedOfBase;
                  a=PublicOfBase;
            }
};
```

(5marks)

Q25 Based on **Q24**, develop a test plan.

(5marks)

SECTION C

Q26 In **Figure Q26**, the derived class `Result` inherits all the properties from the base class `Student` and extends itself by adding some of its own features. Based on the given information, write a program to show a concept of inheritance.
(You should include the driver (main function) in your program.)

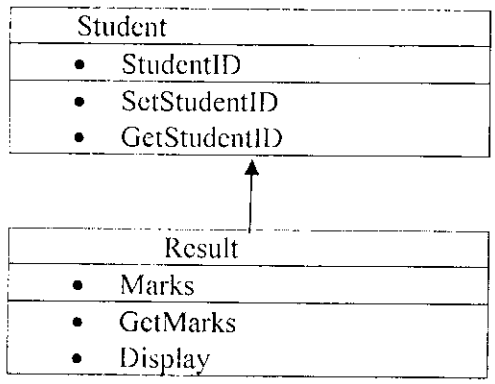

Figure Q26

(15 marks)

Q27 Write a program of class Employee using ***struct*** mechanism to show the concept of file processing. Your program should read from a file and display the output to a screen. Used file "employee.dat" as an input file. The declaration part has been done as below:

```
#include <iostream.h>
#include <fstream.h>

class Empoyee{
      private:
            struct Data{
                  char Name[25];
                  char EmployeeID[10];
                  double salary;
            }empdata;
      public:
            void SetData();
            void GetData();
   };
....

....
```

(15marks)

Q28 **Figure Q28** shows the class diagram of a Person and the following specification is used for Age linked list:

```
class AgeList  {
      protected:
            struct ListNode {
                  Person aperson;
                  ListNode *next;
            };
            ListNode *head;
      public:
            AgeList();
            ~AgeList();
            int IsEmpty();
            void Add(Person newperson);
            void Remove(char name[25]);
            void DisplayList();
};
```

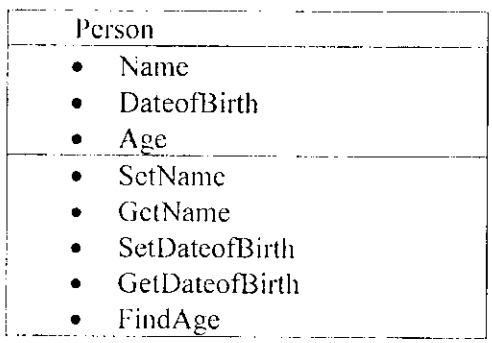

Figure Q28

(a) Implement function `Add(Person newperson)` according to the specification in **Q28**, where the object Person is added into the linked list according to the age.
For example,

If Person A is older than Person B,

Then Person A is the head and Person B is the tail.

Next, if Person C is added to the list, where Person C is older than Person B but younger than Person A,

Then the linked list now becomes: Person A (head), Person C followed by Person B (tail).

(8 marks)

(b) Implement function `Remove(char name[25])` where the Person is removed from the linked list according to the name of the Person.

(7 marks)

(c) Implement function `DisplayList()` to display the data inside the linked list.

(5marks)