

**THE HONG KONG POLYTECHNIC UNIVERSITY**  
**Faculty of Engineering**

Computer Programming Closed-book Written Test 3

Date: 28 March 2009

Time: 2:30 – 3:30 pm

Name: \_\_\_\_\_

Student No. \_\_\_\_\_

Programme Code: \_\_\_\_\_

This test aims at assessing students on the following learning outcomes:

1. Be familiarized with the Visual C++ 2005 programming environment.
2. Be proficient in using the basic constructs of C/C++, such as variables and expressions, looping, arrays and pointers, to develop computer programs.
3. Be able to develop a structured and documented computer program.
4. Understanding the fundamentals of object-oriented programming and be able to apply it in computer program development.
5. Solve problems by using systematic approaches.

Every question belongs to one of the three levels of difficulties:

- Knowledge reflected in the learning outcomes
- Application of knowledge that exceeds the learning outcomes in the majority of regards
- Extrapolation of knowledge that exceeds the learning outcomes in all regards

Grading:

0 - 11 marks	F	12 - 22 marks	D, D+
23 - 34 marks	C, C+	35 - 48 marks	B, B+
49 - 60 marks	A, A+		

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***Instruction:*** Choose only one answer for each question ***unless stated otherwise.*** Choose the answer(s) by circling it/them. Each question carries 2 marks. The total marks are 60.

Q1 Given the following C++ declaration statement, what is the value of `b[1][0]`?

```
int b[2][2] = {1, 3, 34, 28};
```

- a) 3      b) 34      c) 0      d) Undetermined as the above is an error statement  
e) None of the above.

2K

Q2 It is given that `k[]` is an integer array stored in the stack of address 2000, `kptr` is a pointer declared as follows.

```
int k[20];  
int *kptr=k;
```

Assume that an integer is 4-byte long, what is the value of `kptr+3`?

- a) 2003      b) 2006      c) 2012      d) 2024      e) None of the above.

2K

Q3 Which of the following is not a valid enumeration statement?

- a) enum person {me, you, me};      b) enum person {me, you, them};  
c) enum person {me=1, you =2, them=3};      d) enum person {me=0, you =0, them=0};  
e) enum person {me=2, you =1, them=0};

2K

Q4 What is wrong with the following C++ code?

```
const int SIZE =5;
```

```
float scores[SIZE]; //Line 1
for(int i=0; i<=SIZE; i++)
{
    cout << "Enter a score\n";
    cin >> scores[i]; //Line 2
}
```

- a) The array index of `scores[]` should start from 1 but not 0.
- b) The array `scores[]` must be of type `int`.     c) The array index should be smaller than the array size.
- d) **Line 1** will lead to compilation error.     e) **Line 2** will lead to compilation error.

2A

Q5 Assume that the path of an image file is "e:\temp\image.jpeg". Which of the following statement will make the image to be shown in the picture box handled by `pictureBox1`?

- a) `pictureBox1->Image = Image::FromFile("e:\temp\image.jpeg");`
- b) `pictureBox1->Image = Image::FromFile("e:\\temp\\image.jpeg");`
- c) `pictureBox1->Image::FromFile("e:\\temp\image.jpeg");`
- d) `pictureBox1->Image::FromFile("e:\\temp\\image.jpeg");`
- e) `pictureBox1->Image::FromFile("e:\temp\image.jpeg");`

2K

Q6 Which of the following statement about double buffering is NOT true?

- a) Double buffering gives smoother graphic and image display.
- b) Graphic is rendered pixel by pixel directly onto the screen.
- c) Drawing is first done in a buffer; and after it completes, the result is output to the screen.
- d) Double-buffering prevents flickering of images.     e) All the above are true.

2K

Q7 Which of the following statement is NOT true about the `Invalidate()` method?

- a) The `Invalidate()` method is the manual way of triggering a paint event.
- b) In the header file `Form1.h`, writing `this->Invalidate()` is the same as writing `Invalidate()`.
- c) When we call `Invalidate()` in a Windows form, the paint event handler of that form will be called.
- d) If we want to call `Invalidate()` in the header file `Form1.h`, we can write `Form1->Invalidate()`.
- e) None of the above.

2K

Q8 A class named `Department` contains a public member function named `showStudent()` that neither has input parameter nor returns any data. Which of the following is a correct function prototype for `showStudent()`?

- a) `Department.showStudent()`     b) `Department->showStudent()`
- c) `Department::showStudent()`     d) `void Department.showStudent()`
- e) `void Department::showStudent()`

2K

Q9 Which of the following C++ statement will return a number between 1 and 100 inclusively?

- a) rand()/100;                    b) rand()\*(100 + 1);                    c) rand()\*100;  
 d) rand()%100 + 1;                    e) None of the above.

2A

Q10 On executing the following C++ programme, what will be the output shown on the screen?

```
#include <iostream>
using namespace std;
void check (int x, int y)
{
    if (x > 5)
        if (y < 3)
            cout << "Hello ";
        else
            cout << "Hi ";
    cout << "Bye " ;
    if (x > 5) {
        if (y < 3)
            cout << "Hello " ;}
    else {
        cout << "Hi " ;
        cout << "Bye " ;}
}
int main () {
    check (1, 1);
    check (1, 4);
}
```

- a) Hi Bye Hi Bye                    b) Bye Hi Bye Hi Bye                    c) Bye Hi Bye  
 d) Hi Bye Hello                    e) Bye Hi Bye Bye Hi Bye

2K

Q11 Given the following class and array declaration, how could we print out the age of the 10-th person in the array?

```
class personClass
{
public:
    void setAge(int newAge) {age=newAge;}
    void setGender( char newGender) {gender=newGender;}
    void setSalary(float newSalary) {salary=newSalary;}
    int getAge() {return age;}
    char getGender() {return gender;}
    float getSalary() {return salary;}
private:
    int age;
    char gender;
    float salary;
};
personClass people[100];
```

- a) cout << people[10];                    b) cout << people[9];                    c) cout << people[9].age;  
 d) cout << people[9].getAge();                    e) None of the above.

2K

Q12 On executing the following C++ programme, what will be the output shown on the screen?

```
#include <iostream>
using namespace std;
int main()
{
    int x=5,y=6;
    int *ptr=&x;
    *ptr=7;
    ptr=&y;
    *ptr=9;
```

```

        cout<<x<<' '<<y;
        return 0;
    }

```

- a) 5 6      b) 5 7      c) 5 9      d) 7 6      e) 7 9

2K

Q13 On executing the following C++ programme, what will be the output shown on the screen?

```

#include <fstream>
#include <iostream>
using namespace std;
int main()
{
    ofstream test1file("test1");
    test1file << "Good Morning! ";
    test1file.close();
    test1file.open("test1", ios::trunc);
    test1file << "Good Afternoon! ";
    test1file.close();
    test1file.open("test1", ios::app);
    test1file << "Good Evening! ";
    test1file.close();
    ifstream tin("test1");
    tin.seekg(5);
    char ch;
    while (tin.get(ch))
        cout << ch;
    tin.close();
    return 0;
}

```

- a) Good Morning! Good Afternoon! Good Evening!      b) Good Evening!  
 c) Good Afternoon! Good Evening!      d) Afternoon! Good Evening!      e) Evening!

2K

Q14 Given the following C++ class declaration:

```

class CAT //Use a number CatNum to represent a cat
{
public:
    CAT() {pNext=0;}
    ~CAT(){};
    int GetNum() const {return CatNum;}
    void SetNum(int num) {CatNum = num;}
    CAT * GetNext() {return pNext;}
    void SetNext(CAT *pN) {pNext = pN;}
private:
    int CatNum;
    CAT *pNext;
};

```

Assume that a linked list of 3 CAT objects has been built, what can be done by the following function?

```

CAT *func(int n, CAT *firstPtr)
{
    CAT *prevPtr, *currPtr;
    currPtr=firstPtr;
    while (currPtr->GetNum() !=n)
    {
        prevPtr=currPtr;
        currPtr=currPtr->GetNext();
    }
    prevPtr->SetNext(currPtr->GetNext());
    delete currPtr;
    return firstPtr;
}

```

- a) Remove an item at the beginning of a linked list.
- b) Insert an item before the item of a given CatNum value in a linked list.
- c) Remove the item of a given CatNum value from a linked list
- d) Insert an item after the item of a given CatNum value in a linked list.
- e) None of the above.

2A

Q15 On executing the following C++ programme, what will be the output shown on the screen?

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

int n = 30;

void function1()
{
    int n = 40;
    cout << n++ << " ";
}
void function2()
{
    n++;
    cout << n << " ";
}
void function3(int n)
{
    n++;
    cout << n << " ";
}

int main()
{
    int n = 10;
    cout << n << " ";
    function1();
    function2();
    function3(n);
    return 0;
}
```

- a) 30 41 31 11    b) 10 41 31 31    c) 10 41 31 11    d) 10 40 31 11
- e) 30 40 31 31

2E

Q16 On executing the following C++ programme, what will be the output shown on the screen?

```
#include <iostream>
using namespace std;
int main()
{
    int x =2;
    int * pboard[9];
    for(int i=0; i<9;i++)
        pboard[i]=new int[9];
    (*(pboard+x)+x)=1;
    pboard[x][x]=2;
    cout<<*(*(pboard+x)+x)<<endl;
    return 0;
}
```

- a) 0    b) 2    c) 1    d) 9    e) The code contains error(s) and cannot run.

2E

Q17 Consider the following C++ declaration statements:

```
char s1[11];
char *s2="HelloWorld";
char *str1=s1;
```

Which of the following statement does NOT successfully copy s2 to s1? (You may choose more than one answer.)

- a) strcpy(s1, s2);                      b) strncpy(s1, s2, 11);
- c) for (int i=0;(s1[i]=s2[i])!='\0';i++);                      d) s1=s2;
- e) for (;(\*str1=\*s2)!='\0';str1++,s2++);

2E

Q18 Consider the following C++ code and form layout. What will be displayed in the text box after the user clicks the Display button?

```
//event handler for Display button
private: System::Void button1_Click(System::Object^ sender, System::EventArgs^ e) {
    String^ title = "Ginny";
    String^ title1= "Benny";
    int a = 10;
    int b = 30;
    String^ no=""+"a+b;
    textBox1->Text=title+" "+title1+" "+no;
}
```



- a) 1030                      b) Ginny Benny                      c) Ginny Benny 1030
- d) Ginny Benny 3010                      e) Ginny Benny 40

2A

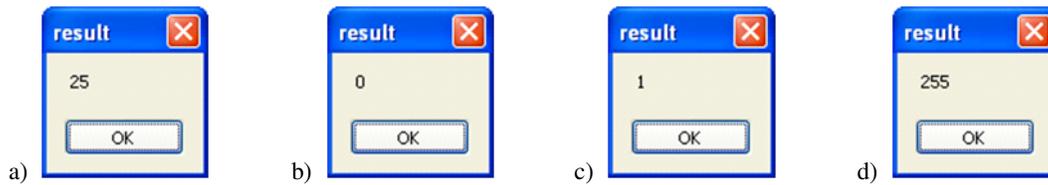
Consider the following C++ code and form layout. Then answer Questions 20 and 21.

```
#include <stdlib.h>
using namespace System::Runtime::InteropServices;

//event handler for Square button
private: System::Void button1_Click(System::Object^ sender, System::EventArgs^ e) {
    int a=2,result=0;
    String ^ tbstr1 = textBox1->Text;
    char *strNum1 =(char*)Marshal::StringToHGlobalAnsi(tbstr1).ToPointer();
    a=atoi(strNum1);
    result= a*a;
    MessageBox::Show(result,"result",MessageBoxButtons::OK); //line 7
}
```



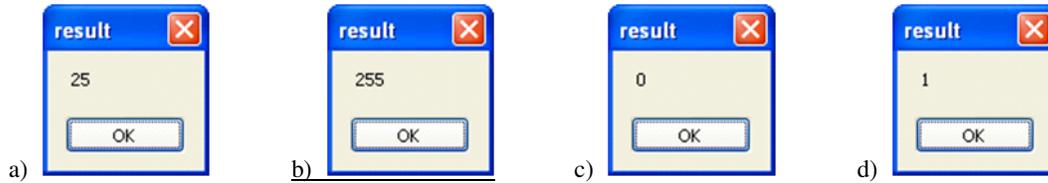
Q19 What will be displayed after the user clicks the Square button?



e) The programme contains error and cannot run.

2A

Q20 If line 7 is replaced by “MessageBox::Show(result+tbstr1, "result", MessageBoxButtons::OK);”, what will be displayed after the user clicks the Square button?



e) The programme contains error and cannot run.

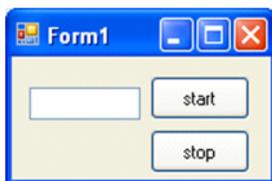
2E

Assume that the member variables x and y have been created and initialized to 0 inside the class Form1. Moreover a timer has also been created. Consider the following C++ code and form layout. Then answer Questions 22 and 23.

```
//event handler for start button
private: System::Void button1_Click(System::Object^ sender, System::EventArgs^ e) {
    x=y=0;
    timer1->Interval=1000;
    timer1->Enabled=1;
    textBox1->Text=y+"m "+x+ "s";
}

//event handler for timer1
private: System::Void timer1_Tick(System::Object^ sender, System::EventArgs^ e) {
    x++;
    if(x==60)
    {
        y++;
        x=0;
    }
    textBox1->Text=y+"m" +x+ "s";
}

//event handler for stop button
private: System::Void button2_Click(System::Object^ sender, System::EventArgs^ e) {
    //Line 17
}
```



Q21 The stop button is used to stop the timer. Which of the following code could be added to Line 17 in order to stop the timer? (You may choose more than one answer.)

- a) timer1->Interval=0;
- b) timer1->Disabled=1;
- c) timer1->Enabled=1;
- d) timer1->Enabled=0;
- e) timer1->Interval=-1;

2E

Q22 What would be the output shown on the screen if the user executes the following programme by typing the

command line “test 1 2 3” in the Command Prompt, where “test” is the programme name?

```
#include <iostream>
#include <stdlib.h>
using namespace std;
int main(int argc, char *argv[])
{
    int temp=0;
    for (int i = 1; i<argc; i++)
        temp=temp+atoi(argv[i]);
    cout<<temp<<endl;
    return 0;
}
```

- a) 0      b) 2      c) 6      d) The programme contains error(s) and cannot run  
e) None of the above.

2K

Consider the following C++ programme and answer Questions 25 - 26.

```
#include <iostream>
#include "string.h"
using namespace std;
int main(){
    char stringOne[256];
    char stringTwo[256];
    cout << "Enter string one: ";
    cin.getline(stringOne,256); //line 8
    cout << "Enter string two: ";
    cin >> stringTwo; // line 10
    strcat(stringTwo, stringOne);
    cout<<stringTwo;
    return 0;
}
```

Q23 If the user inputs to the program are “aa bb” and “dd ee”, both are entered by pressing the Enter key on the keyboard; what will be shown on the output screen on executing the above programme?

- a) dd ee aa bb    b) dd aa bb    c) ddaa bb    d) ddeea bb  
e) None of the above.

2K

Q24 If line 8 and line 10 are changed to “cin >> stringOne;” and “cin.getline(stringTwo, 256);” respectively, and the user inputs to the program are “aa bb cc”; what will be shown on the output screen on executing the above programme?

- a) bb ccaa    b) cc bb aa    c) bbaa    d) ccaabb  
e) None of the above.

2K

Q25 On executing the following C++ programme, what will be the output shown on the screen?

```
#include <iostream>
using namespace std;
int main(){
    cout << "Start "; //there are 3 spaces after "Start"
    cout.fill('*');
    cout << 123 << " End\n";
    return 0;
}
```

- a) Start 123 End    b) Start\*\*\*123 End    c) Start \*123 End

- d) The programme contains error(s) and cannot run. e) None of the above.

2K

Q26 Consider the following C++ function:

```
private: System::Void button1_Click(System::Object^ sender, System::EventArgs^ e) {
    String^ name = "Johnny";
    String^ subno = "ENG236";
    // line 5
}
```



What should line 5 be in order to give the above output shown on the screen?

- a) MessageBox::Show(name, subno, MessageBoxButtons::OKCancel);  
b) `MessageBox::Show(subno, name, MessageBoxButtons::OKCancel);`  
c) `MessageBox::Show(subno, name, MessageBoxButtons::OKandCancel);`  
d) `MessageBox::Show(name, subno, MessageBoxButtons::OKandCancel);`  
e) None of the above.

2E

Q.27 Consider the following C++ function:

```
private: System::Void button1_Click(System::Object ^ sender,
System::EventArgs ^ e) {
    no = 1;
    Form2 ^ F2 = gcnew Form2(no);
    F2->ShowDialog(); //line 5
}
```

Which of the following description(s) for line 5 is correct? (You may choose more than one answer.)

- a) The form generated will be a modal form. b) `Form2` is the name of an object.  
c) We cannot access other forms of the application unless we close the form generated by line 5.  
d) We can access other forms of the application before we close the form generated by line 5.  
e) The form handled by `F2` will still be displayed on the screen if we delete line 5.

2A

Consider the following C++ programme and answer Questions 33 - 34.

```
#include <iostream>
using namespace std;
int main()
{
    char ch;
    ofstream file("EIE236");
    file<<"EIE236 ";
    file.close();
    ofstream file2("EIE236", ios::app);
    file2<<"C++ programming\n";
    file2.close();
    ifstream file3("EIE236");
```

```
while (file3.get(ch))
    cout<<ch;
file3.close();
return 0;
}
```

Q28 When using the classes `ofstream` and `ifstream`, which of the following header file should be included into the programme?

- a) `iostream`      b) `fstream`      c) `stdio.h`      d) `stdlib.h`      e) `math.h`

2K

Q29 The header file mentioned in Q33 is included into the above programme and the application is built. What will be shown on the screen on executing the application?

- a) EIE236 C++ programming      b) C++ programming      c) EIE236  
d) C++ programming EIE236      e) None of above.

2A

Q30 Which of the following about the function `seekp()` is/are true? (You may choose more than one answer.)

- a) It is a member function of `ofstream`, and it returns the current position of the cursor.  
b) It is a member function of `ofstream`, and it sets the current position of the cursor.  
c) It is a member function of `ifstream`, and it returns the current position of the cursor.  
d) It is a member function of `ifstream`, and it sets the current position of the cursor.  
e) None of above.

2K

- End -