COS1512 Now 2022 Exam - Exam

Introduction to programming II (University of South Africa)

MENU

Started on	Friday, 11 November 2022, 9:57 AM
State	Finished
Completed on	Friday, 11 November 2022, 11:57 AM
Time taken	2 hours

Question **1**

Complete

Marked out of 1.00

Given the code

```
vector<int> numbers(20);
```

what is the result of executing the following statement?

```
numbers.resize(10);
```

Select one:

- This causes a run-time error
- The last 10 elements are removed
- No change
- The first 10 elements are removed

Question 2

Complete

Marked out of 4.00

MENU

Consider the following partial class declaration of an ADT:

```
class Player
{
    friend istream & operator >> (istream & ins, Player & P);
    public:
        Player();
        Player(string nam, int point);
        int getPoints()const;
        void setName(string n);
        void increment(int nrPoints);
    private:
        string name;
        int points;
};
```

Complete the code below by choosing the correct options in the drop-down lists.

Player aPlayer(" ", 0); //Instantiate an object aPlayer of the class Player using the default constructor

cin >> aPlayer; //Use the overloaded stream extraction operator to read a value for the object aPlayer from the keyboard

if (aPlayer.getPoints() < 100) //Test if aPlayer's points is less than 100,

aPlayer.points = aPlayer.points + 20; //If the points is less than 100, increment it by 20.

Question 3

Complete

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MENU

Given the two function declarations for function `func`, that does the same except that one version expects two integer parameters, and the other expects a `float` and an integer parameter

```
void func(int a, int b)
{
}
void func(int a, float b)
{
}
```

Which parameters would you change to a T in order to make this a template function?

Select one:

- Neither parameters change.
- Both parameters change.
- The parameter that is an integer in one function and a `float` in the other function.
- The parameter that always stays an integer.

Question 4

Complete

Marked out of 1.00

In the derived class definition, you list from the base class

Select one:

- only those member functions that need to be redefined.
- all the member functions every time.
- only those member functions you want to overload.
- only those member functions that were in the public section.

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MENU

A C++ class template can support different data types for the same logic.

Select one:

- True
- False

Question 6

Complete

Marked out of 7.00

MENU

Consider the partially-coded program to process a text file "Characters.txt" character by character.

Complete the code below by choosing the correct options in the drop-down lists.

```
#include < fstream > // directive for using a file

//other directives

using namespace std;

int main()

{

    ifstream inFile;  //declare input stream for file input

    inFile.open("Characters.txt");  //open and connect input stream to a file "Characters.dat"

     if  !(inFile)  //check if input file exists

    {

     //exit program if input file does not exist

    }

    char ch;

    inFile.get(ch);  //read character from input file

    while ( inFile.eof() ) //to read all characters from input file

    {

       //process character

       //read character from input file

    }

     inFile.close();  //close input file

     return 0;

}
```

Question 7

Complete

Marked out of 1.00

MENU

Given the following template function definition, which of the following is **NOT** a valid invocation of the function?

```
template <class T>
void swap(T& left, T& right)
{
     //implementation goes here, not relevant to the question
}
int int1, int2;
float flt1, flt2;
char ch1, ch2;
string s1, s2;
```

Select one:

- swap(int1, ch2);
- swap(ch1, ch2);
- swap(int1, int2);
- swap(s1,s2);

Question 8

Complete

Marked out of 1.00

The _____ macro prints a message and terminates program execution if the value of the expression the macro evaluates is 0.

Select one:

- fail
- cassert
- ndebug
- assert

Question 9

Complete

Marked out of 1.00

MENU

A character array terminated with the null character is most correctly called

Select one:

- a C-string
- a string
- a character array
- None of the other options

Question 10

Complete

Marked out of 1.00

What is the output of the following code fragment?

```
int v1=2, v2=-1, *p1, *p2;
p1 = & v1;
p2 = & v2;
p2 = p1;
cout << *p2 << endl;
```

Select one:

- 1
- -2
- 2
- -1

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MENU

When working with pointers, the * operator can be used

Select one or more:

- [x] to declare a pointer variable
- [ ] to dereference the value to which a pointer variable points
- [x] to define a pointer type

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For this question you have to type code in the textbox provided. You cannot attach a file as answer. NB: do not use TAB when entering your code, rather use spaces to indent.

Consider the following (partial) class declaration of an ADT provided in a file `Player.h`:

```
class Player
{
    friend bool operator > (const Player &player1, const Player &player2); // returns true if player1 has more points than player2, false otherwise
    friend ostream & operator<<(ostream & out, const Player & P); //displays player's name and points
    public:
        Player();
        ~Player();
        string getName() const;
        void setPoints(int p);
    private:
        string name;
        int points;
};
```

Using **separate compilation**, provide the implementation file for the class `Player`. Include all the necessary header files, and implement **only** the member functions in the given class declaration. There is no need for comments.

```
#include <iostream>
#include "Address.h"

using namespace std;

 Player::Player()
{
   name = " ";
   points = 0;
}

Player::~Player()
{

}

string Player::getName() const
```

```
eturn name;
}
MENU
void Player::setPoints(int p)
{
    this->points = p;
}

bool Player::operator > (const Player &player1, const Player &player2)
{

}

ostream & Player::operator<<(ostream & out, const Player & P)
{

}
```

Question **13**

Complete

Marked out of 1.00

The destructor for a class is called

- when the class is instantiated
- only at the end of the main function
- when the object of the class goes out of scope
- explicitly from the main program

Question 14

Complete

Marked out of 1.00

MENU

If we use an out of range index with a vector, there will be an error message from the compiler.

Select one:

- True
- False

Question 15

Complete

Marked out of 1.00

In which case would you consider using a dynamic array?

Select one:

- If the program needs to get the size of the array from the user because it may differ each time the code is executed
- You should always use a dynamic array.
- If the array size is big, but known at compile time.
- If the array is small, and the size is known before the program runs.

Question 16

Complete

Marked out of 1.00

To declare a vector `shopsInMall` with objects of a class `Shop`, we use the following statement

Select one:

- `vector<Shops> shopsInMall;`
- `vector<Shop> shopsInMall;`
- `vector<shop> shopsInMall;`
- `vector<shopsInMall> Shop;`

Question 17

Complete

Marked out of 1.00

MENU

We can assign a `null` value to a pointer `ptr` with the following statement:

Select one or more:

- `int *ptr = 0;`
- `int* ptr{};`
- `int *ptr = NULL;`

Question 18

Complete

Marked out of 1.00

We can initialize a vector `v` in the following way

Select one or more:

- `vector<int> v(10);`
- `vector<char> v = {'a', 'b', 'c', 'd', 'e'};`
-
```
v.push_back("hi");
v.push_back("there");
v.push_back("hello");
v.push_back("world");
```

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MENU

Consider the template function

```
template <class T>
T secret(T x, T y)
{
     return x + y;
}
```

If `secret` is called in the following statement

```
string s1 = "sunny";
string s2 = "day";
cout << secret (s1, s2);
```

the compiler will expand it to

Select one:

-
```
string secret (string x, string y)
{
     return x + y;
}
```

-
```
int secret (int x, int y)
{
     return x + y;
}
```

-
```
T secret (T x, T y)
{
     return x + y;
}
```

- The compiler will give an error message.

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MENU

Given the declarations

```
class Pet //implemented as an ADT
{
public:
   string getColour();
   string getType();
//other member functions
private:
   string name;
   string colour;
   int age;
};
int nrPets = 30;
Pen myPets[nrPets];
```

To display the names of all the **brown** pets in the array `myPets` on the screen, we use the statement

```
    for (int i = 0; i < nrPets; i++ )
        if (myPets[i].colour == "brown" )
            cout << myPets[i].name << endl;
```

Select one:

- True
- False

Question 21

Complete

Marked out of 1.00

MENU

The base case in a recursive function

Select one:

- generates the recursive calls
- ensures that the recursion will stop eventually
- allows the function to call itself repeatedly
- can be omitted safely

Question 22

Complete

Marked out of 1.00

In order to make a user-defined ADT that is defined in the file `myfile.h` available to the application file, you would use

- #include myfile.h
- #include myfile
- #include "myfile.h"
- #include <myfile.h>

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MENU

Which of the following functions could be included in a program with the function

```
void myFunc(double a, int b);
```

without causing any errors?

Select one:

- `void myFunc(double b, int a);`
- `void myFunc(double a);`
- `void myFunc(double a = 2.2, int b = 3);`

Question 24

Answered

Marked out of 9.00

MENU

Consider the class Student:

```
class Student
{
public:
    Student(string sNr, string sName, string sDegree);
    string getStdtNr()const;
    string getName()const;
    string getDegree()const;
    friend ostream& operator<< (ostream& outs, const Student& s);
private:
    string studentNr;
    string name;
    string degree;
};
```

(a) Derive a class `Postgrad` from the class `Student`. Provide only the interface for the class `Postgrad`. The class `Postgrad` has an additional private string member variable `supervisor`. Redefine the overloaded operator `<<` for the class `Postgrad`. (6)

(b) Implement only the overloaded constructor for the class `Postgrad`. (3)

MENU

Question **25**

Complete

Marked out of 1.00

Consider the accompanying definition of a recursive function. Which of the statements represent the general case?

```
void printNum(int num)                    //Line 1
{                                         //Line 2
  if (n < 0)                              //Line 3
     cout << "Num is negative" << endl;    //Line 4
  else if (num == 0)                      //Line 5
     cout << "Num is zero" << endl;        //Line 6
  else                                    //Line 7
  {                                       //Line 8
     cout << num << " ";                  //Line 9
     printNum(num - 1);                   //Line 10
  }                                       //Line 11
}                                         //Line 12
```

Select one:

- Statements in Lines 3-11
- Statements in Lines 5-6

◄ Additional Resources

Jump to...

Question 26

Complete

Marked out of 1.00

MENU

Given the declarations

char s1[ ];
char s2[ ];
char s3[ ];
We can concatenate `s1` and `s2` into `s3` with the statement

```
s3 = s2 + s2;
```

Select one:

- True
- False

Question 27

Complete

Marked out of 1.00

Which of the following statements regarding dynamic variables is true?

- A dynamic variable is accessed via a pointer variable.
- A dynamic variable is created using the `new` operator.
- A dynamic variable is a variable that is created and destroyed during the execution of the program.

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MENU

Given the declarations

```
char s1[9];
char s2[9];
```

the correct statement to display "`Well done!`" when the first 5 characters in `s1` and `s2`, are the same, is

Select one:

```
if (!(strcmp(s1,s2,5)))
   cout << "Well done!";
```

```
if (!(strncmp(s1,s2,5)))
   cout << "Well done!";
```

```
if (strncmp(s1,s2,5))
   cout << "Well done!";
```

```
if (strcmp(s1,s2,5))
   cout << "Well done!";
```