

QB365 Question Bank Software Study Materials

Importing C++ Programs in Python Important 2, 3 & 5 Marks Questions With Answers (Book Back and Creative)

12th Standard

Computer Science

Total Marks : 75

2 Marks
B I Font Sizes ▾

10 x 2 = 20

- 1) What is the theoretical difference between Scripting language and other programming language?

Answer : (i) The theoretical difference between the two is that scripting languages do not require the compilation step and are rather interpreted.

(ii) For example, normally, a C++ program needs to be compiled before running whereas, a scripting language like JavaScript or Python need not be compiled.

(iii) A scripting language requires an interpreter while a programming language requires a compiler.

- 2) Differentiate compiler and interpreter.

Answer :

S.NO	COMPILER	INTERPRETER
(i)	It takes an entire Program at a time.	It takes a single line of code or instruction at a time.
(ii)	Display all errors after compilation, all at the	Displays error of each line one by one.

- 3) Write the expansion of (i) SWIG (ii) MinGW

Answer : (i) **SWIG** - Simplified Wrapper Interface Generator

(ii) **MinGW** - Minimalist GNU for Windows

- 4) What is the use of modules?

Answer : Modular programming is a software design technique to split our code into separate parts. These parts are called modules. The focus for this separation should have modules with no or just few dependencies upon other modules.

- 5) What is the use of cd command. Give an example.

Answer : 'cd' command refers to change directory and absolute path refers to the couple path.

(Eg) "cd c:\program files\open office 4\program"

- 6) What is glue language?

Answer : Python is mostly used as a scripting or 'glue' language. i.e) the top-level program mostly calls routines written in C or C++. This is useful when the logic can be written in terms of existing code but can be called and manipulated through a Python program.

- 7) What is scripting language?

Answer : A scripting language is a programming language designed for integrating and communicating with other programming languages.

- 8) Define wrapping up?

Answer : Importing a C++ program in a Python program is called wrapping up of C++ in Python. Wrapping or creating Python Interfaces for C++ programs are done in many ways.

- 9) What is the use cls command?

Answer : To clear the screen in command Window use cls command.

- 10) How will you access the module function?

Answer : Using the module name we can access the functions defined inside the module. The dot (.) operator is used to access the functions.

3 Marks

10 x 3 = 30

11) Differentiate PYTHON and C++.

Answer :

S.NO	PYTHON	C++
(i)	Python is typically an "interpreted" language	C++ is typically a "compiled" language
(ii)	Python is a dynamic typed language	C++ is compiled statically typed language
(iii)	Data type is not required while declaring variable	Data type is required while declaring variable
(iv)	It can act both as scripting and general purpose language	It is a general purpose language

12) What are the applications of scripting language?

- Answer :**
- (i) To automate certain tasks in a program
 - (ii) Extracting information from a data set
 - (iii) Less code intensive as compared to traditional programming language
 - (iv) can bring new functions to applications and glue complex systems together
 - (v) Conjunction with other programming languages HTML, Java, C++.

13) What is MinGW? What is its use?

- Answer :**
- (i) MinGW refers to a set of runtime header files, used in compiling and linking the code of C, C++ and FORTRAN to be run on Windows Operating System.
 - (ii) MinGw- W64 (version of MinGW) is the best compiler for C++ on Windows. To compile and execute the C++ program, need 'g++' for Windows. MinGW allows to compile and execute C++ program dynamically through Python program using g++.
 - (iii) Python program that contains the c++ coding can be executed only through 'MinGW_w64 project' run terminal. The run terminal open the command -line window through which Python program should be executed.
 - (iv) g++ is a program that calls GCC (GNU C compiler) and automatically links the required C++ Library files to the object code.

14) Identify the module, operator, definition name for the following `welcome.display()`.

- Answer :**
- welcome → module name
 - → operator name
 - display() → definition name

15) What is `sys.argv`? What does it contain?

Answer : `sys.argv` is the list of command-line arguments passed to the Python program. `argv` contains all the items that come along via the command-line input, it's basically an array holding the command-line arguments of the program. To use `sys.argv`, we will first have to import `sys`. The first argument, `sys.argv [0]`, is always the name of the program as it was invoked and `sys.argv [1]` is the first argument we pass to the program.

Example:

`main (sys.argv [1])` - Accepts the program file and the input file as a list. `argv[0]` contains the python program which is need not to be passed because by default `_main_` contains source code reference and `argv[1]` contains the name of the C++ file which is to be processed.

16) Write short notes on python language.

Answer : Python is actually an interpreter, high-level, general-purpose programming language that can be used on any modern computer operating System. It can be used for processing text, numbers, images, and scientific data, and just about anything else we might save on a computer. Nowadays, large applications are written almost exclusively in Python.

17) Write short notes on Python program to import C++.

Answer : Python contains many modules. For a problem Python allows programmers to have the flexibility in using different modules at their convenience. The Python program that we have written contains a few new commands which we have not come across in the basic Python program. Since our program is an integration of two different languages, we have to import the modules like os, sys, and getopt.

18) Write a C++ Program to check the given number is palindrome or not.

Answer : Program:

```
#include < iostream >
using namespace std;
intmain ( )
{
int n, num, digit, rev = 0;
cout < < "Enter a positive number: ";
cin > > num;
n = num;
while(num)
{digit = num % 10;
rev = (rev * 10) + digit;
num = num / 10; }
cout< < "The reverse of the number is:" < < rev < < endl;
if(n == rev)
Cout< < "The number is a palindrome";
else
cout< < "The number is not a palindrome ";
return 0;
}
```

19) Write the steps for executing C++ program.

Answer : The steps for executing the C++ program to check a given number is palindrome or not is given:

Step 1: Type the C++ program to check whether the input number is palindrome or not in notepad and save it as "pali_cpp.cpp".

Step 2: Type the Python program and save it as pali.py.

step 3: Click the Run Terminal and open the command window.

Step 4: Go to the folder of Python using cd command.

Step 5: Type the command Python pali.py -i pali_cpp.

20) Write a C++ program to print a Transpose of Matrix.

Answer : Program:

```
#include < iostream >
using namespace std;
int main ( )
{
int a [3] [3], i, j;
for(i=0; i< 3; i++)
{
for(j=0; j< 3; j++)
{cout<< "enter the value for array["<< i+ 1<< "]"<< "["<< j+ 1<< "]:";
cin >> a[i][j];
}
}
system ("cls");
cout<< "\n\nOriginal Array\n";
for(i=0; i< 3; i++) {
for(j=0; j< 3; j++ )
cout<< a[i] [j]<< ' ';
cout<< endl; }
cout<< "\n\n The Transpose of Matrix \n";
for (int i = 0; i < 3; i++)
{
for (int j = 0; j < 3; j++)
cout<< a [j] [i]<< ' ';
cout<< endl;
}
return 0;
}
```

5 Marks

5 x 5 = 25

21) Write any 5 features of Python.

- Answer :** (i) Python uses Automatic Garbage Collection whereas C++ does not.
(ii) C++ is a statically typed language, while Python is a dynamically typed language.
(iii) Python runs through an interpreter, while C++ is pre-compiled.
(iv) Python code tends to be 5 to 10 times shorter than that written in C++.
(v) In Python, there is no need to declare types explicitly where as it should be done in C++.
(vi) In Python, a function may accept an argument of any type, and return multiple values without any kind of declaration beforehand. Whereas in C++ return statement can return only one value.

22) Explain each word of the following command.

Python < filename.py > - < i > < C++ filename without cpp extension >

Answer : Python < filename.py > - < i > < C++ filename without cpp extension >

Python	Keyword to execute the Python program from command-line
filename.py- i	Name of the Python program to executed input mode
C++ filename without cpp extension	Name of C++ file to be compiled and executed

For example type Python pycpp.py - i pali in the command prompt and press enter key. If the compilation is successful we will get the desired output. Otherwise the error will be displayed.

23) What is the purpose of sys, os, getopt module in Python.Explain.

Answer : (i) Python's Sys module:

This module provides access to some variables used by the interpreter and to functions that interact strongly with the interpreter.

sys.argv:

(i) sys.argv is the list of command-line arguments passed to the Python program. argv contains all the items that come along via the command-line input, it's basically an array holding the commandline arguments of the program.

(ii) To use **sys.argv**, we will first have to **import sys**. The first argument, sys.argv[0], is always the name of the program as it was invoked, and sys.argv[1] is the first argument you pass to the program (here it is the C++ file).

Example:

main (sys.argv [1]) Accepts the program file and input file as a list. argv [0] contains the Python program which is need not to be passed because bydefault_main_contains source code reference and argv [1] contains the name of the C++ file.

(ii) Python's OS module:

The OS module in Python provides a way of using operating system dependent functionality.

The functions that the OS module allows to interface with the windows operating system where Python is running on.

OS.system(): Execute the C++ compiling command in the shell.

Example:

os.system < 'g++'+< variable - name 1 > - '< mode > ' < variable_name 2 >

os.system:	Function system() defined in os module.
g++:	General compiler to compile C++ program under windows Operating system.
Variable_name 1:	Name of the C++ file without extension. cpp in string format.
Mode:	To specify input or output mode. Here it is o prefixed with hyphen.
Variable_name 2:	Name of the executable file without extension.exe in string format.

(iii) Python getopt module:

The getopt module of python helps to parse command-line options and arguments. This module provides two functions to enable command-line argument parsing.

getopt.getopt method:

This method parses command line options and parameter list.

Syntax:

< opts > , < args > = getopt.getopt(argv, options, [long_options])

argv - This is the argument list of values to be parsed.

options - This is string of option letters that the Python program recognize as, for input or for output with options 'i' or 'o' that followed by a colon(:).

Long- options - This parameter is passed with a list of strings. Argument of long options should be followed by an equal sign '='.

24) Write the syntax for getopt() and explain its arguments and return values.

Answer : getopt() method returns value consisting of two elements. Each of these values are stored separately in two different list opts and args. opts contains list of splitted strings like made, path and args contains any string if at all not splitted because of wrong path or mode. args will be an empty array if there is no error in splitting strings by getopt().

Example:

The Python code which is going to execute the C++ file p4 in command line will have the getopt() method.

Syntax:

opts, args = getopt.getopt (argv, "i:", ['ifile ='])

where opts contains ('-i','c:\pyprg\p4')]

-i:- option nothing but mode should be followed by

'c:\pyprg\p4' value nothing but the absolute path of C++ file,

Since the entire command-line commands are parsed and no leftover arguments, the second argument args will be empty[].

25) Write a Python program to execute the following c++ coding.

```
#include < iostream >
using namespace std;
int main()
{ cout<< < "WELCOME";
return(0);
}
```

The above C++ program is saved in a file welcome.cpp

Answer : Execution Steps:

```
//save above file as welcome.cpp
#Now select File - > New in Notepad and type the Python program
#save the file as fun.py
#Program that compiles and executes a .cpp file
#Python fun.py- iC: |pyprg| welcome - file.cpp
```

Program:

```
import sys, os, getopt
def main (argv):
    cpp_file=""
    exe_file=""
    opts, args = getopt.getopt(argv, "i:", ['ifile='])
    for o a in opts
    if o in ("-i, "--ifile"):
        cpp_file=a+ '.cpp'
        exe_file = a+ 'exe'
    run (cpp_file, exe_file)
def run (cpp_file, exe_file):
    print("Compiling" + Cpp_file)
    os.system ('g++' + cpp_file+'_o'+exe_file)
    print("Running" + exe_file)
    print("-----")
    print
    Os.system(exe_file)
    print
if_name_=='_main_':
    main (sys.argv [1:])
```

Output:

welcome.