



~~23/5/2016~~
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DOON UNIVERSITY, DEHRADUN
School of Technology

Integrated MCA, Second Semester, End Semester Examination, 2016
STM-513: Object Oriented Programming (C++)

Time Allowed: 3 Hours

Maximum Marks: 50

Note: Complement your answer with suitable examples (code segments)

SECTION: A (Short Answer Type Questions)

(Total Marks: 5 x 2 = 10)

1. Choose the correct option:

a) Which of the following return value of the main function signifies successful termination of a C++ program?

- A) -1
- B) 0
- C) 1
- D) Any non-zero value

b) Consider the array allocation statement

```
int *pa = new int[100];
```

Which of the following represents the correct syntax for releasing this array?

- A) delete pa;
- B) delete pa[100];
- C) delete *pa;
- D) delete []pa;

c) If file is a fstream object, then which of the following statements, represents the correct syntax for opening a file "Exam" for performing both input and output operations?

- A) file.open("Exam", ios::in & ios::out);
- B) file.open("Exam", ios::in, ios::out);
- C) file.open("Exam", ios::in | ios::out);
- D) file.open("Exam", ios::in | out);

d) What will be the output of the following C++ statement?

```
cout << setw(6) << setfill('#') << 100 << 1 << endl;
```

- A) 1001###
- B) ###1001
- C) 100##1
- D) #1001#

2. Fill up the blanks:

- a) _____ form of **catch** is used to catch all exceptions that you don't want to handle explicitly.
- b) In contrast to pointer in C, _____ is used in C++ that acts as an alias for an already existing object.
- c) Run-time polymorphism is achieved only when a _____ function is accessed through a _____ pointer.
- d) _____ and _____ flags are used to display the trailing zeros and plus sign respectively.

3. What will be the output of the following C++ statements?

a) `cout << strcmp("strcmp()", "strcmp()");`

b) `char s[] = "C++"; cout << s << endl; s++; cout << s;`

4. Find errors, if any, in the following C++ statements.
 - a) enum (off, on);
 - b) int & num = 2;
5. a) What is the only difference between a structure and a class in C++?
 b) How does protected access specifier differ from private access specifier?

SECTION: B (Long Answer Type Questions)

(Total Marks: 5 x 4 = 20)

Consider a custom class **String** with following two private data members:

```
char *p; // p points to the first character of the string
int len; // len holds the length of the string (including the terminating '\0' character)
```

1. a) Define a constructor for the **String** class that takes one quoted string as an input argument with default value as a null string "".
 b) Define a destructor for the **String** class.
2. a) State the necessity of defining a copy constructor for a C++ class.
 b) Define copy constructor for the **String** class.
3. a) Why might it be useful to overload the assignment operator for a C++ class?
 b) Define overloaded assignment operator for the **String** class.
4. a) What is the arity of [] operator? What are the operands for the same?
 b) Overload [] operator to access the ith character of the string directly using the **String** object.
5. a) In which situation, an overloaded binary operator is defined as a friend function?
 b) Define inserter and extractor for the **String** class.

SECTION: C (Very Long Answer Type Questions)

(Total Marks: 4 x 5 = 20)

1. a) How do you pass parameters to base class constructors? What is the order of execution of constructors and destructors of base and derived classes when a derived class object comes into/goes out of existence?
 b) Explain the concept of virtual base class.
2. a) Differentiate virtual functions from pure virtual functions.
 b) Differentiate function overloading from function overriding.
3. a) What is a function template? Define a generic function to search for an element in an array using binary search.
 b) What is a class template? Define a generic class to create a stack of elements with essential stack operations.
4. Write short note on the following C++ functions:
 - a) getline()
 - b) read()
 - c) write()
 - d) setf()
 - e) open()