

**JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY–NOIDA**  
**CI311- Object-Oriented Programming**  
**Tutorial / LAB – Week 1 [11/08/14 to 16/08/14]**

Note: For all assignments you have to read any one book from the reference list on C++, in order to get hold of the syntactical difference in C and C++ procedural programming.

- Maintain a separate comprehensive OOPS notebook (for noting your work in lecture, tutorials, homework and lab work).
- **You will not be allowed to enter the lab without notebook and a book.**
- Notebook will be randomly checked and signed. Negative marking for not presenting notebook.

Ques-1 Read any book on C++. Make a list of syntactical differences in C and C++ procedural programming.

- a) Compile all the differences in your lab notebook and show it to your instructor.
- b) Mention the advantages of C++ over C language.
- c) How do you encapsulate the data using C language.

Ques-2 Create a structure in C++ to implement the following Data Structures:

- a) Stack
- b) Queue

with members an integer array of variable size (**use only pointer no predefined size**) and necessary index locator e.g top, front, rear etc. Declare and Define functions to represent behaviour of stack (LIFO) and Queue (FIFO) with appropriate parameters wherever required. Can you put these functions inside structures definitions, test it and give result. Can you invoke those functions using structure variables, try out all the possibilities using main method.

Study use of new operator in C++ for dynamic memory allocation.

Ques-3 What happens when the following code is embedded in main, compiled and run. Write your observation in notebook. Write errors / output interpretation in notebook, correct them and run the code.

```
a) for(int i = 1; i < 3; i++)  
    for(int j = 3; j > i; j--)  
        cout<<j;assert i!=j
```

```
b) for(int i = 1; i < 3; i++)  
    for(int j = 3; j >= 1; j--)  
        cout<<j;assert i!=j
```

```
c) for(int i = 1; i < 4; i++)  
    for(int j = 1; j < 4; j++)  
        if(i < j)  
            cout<<j; assert i!=j
```

Study use of function assert in assert.h

For Ques 4-7 Read Chapter -9 from “C++ How to Program (7th Edition) by Harvey & Paul Deitel & Deitel and Harvey Deitel”.

Ques 4. Ques 9.5 on Page 515-516

Ques 5. Ques 9.6 on Page 516

Ques 6. Take the Time Class and provide a constructor that is capable of using current time from the time function declared in C++ library to initialize object of Time class.

Ques 7. Ques 9.11-9.13 on Page 517

Ques 8. Ques 9.14 on Page 517

Ques 9. Ques 9.7 on Page 517

Ques 10. Define a class Income having the interface pay salary, Compute Deductions, Calculate Tax. Salary consists of Basic, DA, 15% of basic as HRA. Deductions are for the staff canteen and PF at 8% of Basic. Tax is 20% for annual incomes less than one lakh rupees and 30% above this. A tax surcharge of 10% is additionally charged for the latter income group.