2/12/14 Regular (M) Comp

COMP 3 – 2 (RC)

S.E. (Computer) (Semester – III) (RC) Examination, Nov./Dec. 2014
BASICS OF C++

Duration: 3 Hours | Max. Marks: 100

Instructions : *i) Attempt **any five** questions by selecting at least **one** question from **each** Module.*
*ii) Make suitable assumptions **if required**.*

MODULE – I

1. a) List the basic differences between C and C++. 4

   b) Write a C++ program to print multiplication table upto the table of any N, using do while loop. 8

   c) Write a program in C++ to construct the following pyramid of digits. 8

```
                1
            2   3   2
        3   4   5   4   3
    4   5   6   7   6   5   4
5   6   7   8   9   8   7   6   5
```

2. a) Explain Johnstons rules for programmers. 3

   b) What do you mean by precedence of operators ? Give the precedence of arithmetic, relational, bitwise and logical operators in C++.

   Solve 5 + 8 <14 – Z || 16 > 3, using precedence. 7

   c) Write a C++ program to print the sum of first N odd numbers. 5

   d) Write a C++ program for computing factorial of a number using while loop. 5

MODULE – II

3. a) Explain the differences between pointers and references. 2

   b) Explain the various functions defined in string.h library using an example for each. 5

   c) Write a function to take an integer number as an argument and return 1 if it is a prime number and 0 otherwise. Use the function to display all prime numbers less than 1000. 8

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d) Explain the following :
   i) Passing a two dimensional array to a function
   ii) Returning an array from function. 5

4. a) Explain the array out of bounds situation. Explain the ways to handle this situation. 4

   b) Show how the elements of one and two dimensional arrays can be manipulated by means of pointer variables, or interchangeably, by using the index ? 4

   c) What are default arguments ? How are actual arguments different from formal arguments ? 4

   d) Write C++ functions to find a transpose of given square matrix of size N and to check the symmetric property of a square matrix of size N. Write a main() function to call these functions. 8

MODULE – III

5. a) Differentiate a class and a structure. 3

   b) What are different access specifiers in C++ ? Illustrate their usage with examples. 3

   c) What do you understand by enumerated data type ? Explain with examples. 4

   d) Define a class called book with data members book name, author name, publisher, year of publication and cost. Define functions to add, delete and modify the information regarding the book. Display all the book information ordered according to their year of publication. 10

6. a) What is operator overloading ? Explain the importance of operator overloading. 4

   b) Define a class to represent a bank account. Include the following data members : Account holder's name, account number, account type, date of account opening and balance. Define functions to initialize values, deposit an amount into account if it is of Saving Bank type and withdraw an amount after verifying the balance. Write a main function also. 8

   c) What is an automatic default constructor, and what does it do ? 2

   d) Write a C++ program to overload binary operator '–' for the subtraction of two complex numbers using classes. 6

MODULE – IV

7. a) Explain how new and delete are used in dynamic memory allocation. 3

   b) What is inheritance ? Explain the need of inheritance with suitable examples. 4

   c) How is dynamic binding achieved ? State rules for defining virtual functions. 5

   d) Write a program to define a class part with data members part name, part number and part cost. The part class should inherit product class and design class. The data members of product class are height, weight and date. Whereas, the data members of design class are design no, track and name of designer. Define constructors and destructors for all the classes. Define function showdata() at each class. Write a main program to display the values of data members. 8

8. a) Explain the ways to allocate memory for 2-D and 3-D arrays in dynamic fashion. Give relevant code segments. 6

   b) Under what circumstances is it useful to catch exceptions by reference or pointer ? 3

   c) Write a program to compute a ratio of two integers. Include exception handling features to guard against division by zero error. 8

   d) What is virtual base class ? Explain. 3