04-06-15(M)

COMP 3 – 2 (RC)

S.E. (Computer) (Semester – III) (RC) Examination, May/June 2015
BASICS OF C++

Duration: 3 Hours | Total 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) Explain what is meant by the term "software development model". **4**

   b) What is the principal mechanism for encapsulation in C++ ? **3**

   c) How does a constant defined by "const" differ from the constant defined by the pre-processor statement #define ? Explain with example. **4**

   d) Write a C++ program to print the following output using the for loops. **5**

   E E E E E
   D D D D
   C C C
   B B
   A

   e) Explain the following with example code segment. **4**

   i) nested if statement

   ii) namespaces.

2. a) Describe the basic data types of C++ along with their bytes of memory occupied and their minimal precision. **4**

   b) Explain the various control structures and loops in C++ using flow charts and examples. **6**

   c) Write a C++ program to display the roots of a quadratic equation using switch statement. **4**

   d) Write a C++ program to display first M natural numbers along with their square, square root, cube and cube roots using **6**

   i) for loop

   ii) do-while loop.

P.T.O.

MODULE – II

3 a) Explain with an example the address operator '&' and how it can be used with pointers. 4

b) Write a program which reads in a list of real numbers from an user. It should allocate just sufficient space for an array to store the values. The program should then calculate the average, maximum and minimum of the numbers. The allocated space should be freed at the end of the program. 8

c) Explain the following : 8

i) default parameters

ii) function prototype

iii) inline functions

iv) auto, static, global variables.

4. a) Write a function in C++, which given two 3 x 3 float arrays representing matrices as arguments, calculates their matrix product. 6

b) What is meant by the term 'Arrays out of bounds' ? Does C++ automatically check and stop the programmer from going out of bounds with array ? Explain. 4

c) Write a program to read a character string and

i) display the same in reverse order

ii) count the number of vowels in it

iii) check whether a given substring is present in it

iv) arrange the characters in the string in ascending order. 10

MODULE – III

5. a) What is a friend function ? Explain its use with an appropriate example. 5

b) Write a C++ program to overload unary operators to perform increment and decrement operations on objects of a class of complex numbers. 7

c) What are the differences between structures and classes in C++ ? 3

d) A company plans to store the following information about its employees.

i) name

ii) designation

iii) year of experience

iv) monthly salary.

Declare a structure to store this information. Write a program to read the information of 10 employees and display them. 5

6. a) What do you understand by the term 'Data Encapsulation' ? Explain how C++ supports data abstraction. 5

   b) Explain the use of constructors and destructors with examples. 5

   c) Define a class called distance with data members feet and inches. Define the member functions like get data() and print data() to read and display the data. Define functions

      i) to subtract two distance objects

      ii) to compare two distance objects

      iii) to convert the distance form feet-inches to meter-centimeter

      iv) to overload –+ operator. 10

MODULE - IV

7. a) Explain the need of inheritance with suitable examples. 4

   b) What are the differences between inherting a class with public and private visibility mode ? 4

   c) Construct three classes Mammal, Person and student such that person is inheriting from Mammal and student is inherting from person. Define suitable data members and member function to demonstrate the concepts of function overloading, function overriding, data overriding and polymorphism. 12

8. a) What are virtual classes ? Explain the need for virtual classes while building a class hierarchy. 4

   b) Explain the concept of dynamic memory allocation. 3

   c) Write a program to construct a three dimension array using dynamic memory allocation. Define the functions to read and display the contents of the array. 8

   d) Explain how exceptions work in C++ with suitable code segments. 5