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COMP 3 – 2 (RC)

S.E. (COMP.) (Semester – III) Examination, November/December 2013
(Revised Course)
BASICS OF C++

Duration: 3 Hours   Total Marks: 100

Instructions : 1) *Answer **any five** questions selecting at least **one** from **each** Module.*

2) *Make necessary assumptions **if required**. **Clearly** state any such assumptions made.*

MODULE – I

1. a) Compare and contrast structured programming Vs object oriented programming.   4

   b) What is the output when the following code fragment is executed ?   5

   ```
   int n, k = 5;
   n = (100 % k ? k + 1 : k – 1);
   cout << "n = " << n << " k = " << k << endl;
   ```

   c) Write a program to read a set of numbers and find   9
      i) Sum of all odd integers
      ii) Smallest of them
      iii) Range (i.e. difference between smallest and largest numbers)
      (Do not use arrays)

   d) What is the difference between local and static variables ?   2

2. a) Explain typecasting. What are explicit and implicit type conversions ?   4

   b) Write code to demonstrate the difference between the New and delete operators.   4

   c) If a four digit number is input through a keyboard write a C++ program to obtain the sum of the first and last digits of this number.   6

P.T.O.

d) Remove all the unnecessary tests from the nested conditional statements below :   6

```
float income;

cout << "Enter your monthly income : ";

cin >> income;
if (income < 0.0)

cout << "You are going farther into debt every month." << endl;

else if (income >= 0.0 && income < 1200.00)

cout << "You are living below the poverty line." << endl;

else if (income >= 1200.00 && income < 2500.00)

cout << "You are living in moderate comfort." << endl;

else if (income >= 2500.00)

cout << "You are well off." << endl
```

MODULE – II

3. a) Write a program to compute factorial of a number using
   (i) Iteration (ii) Recursion. Compare the two methods.   8

   b) Explain the following pointer declaration in C++ :   6
      i) &i
      ii) *(&j)
      iii) *j.

   c) How do you initialize two dimensional arrays ? Explain with example.   6

4. a) Write a program in C++ that allows the user to create a character string and then reverse the characters. Use the concept of functions.

   (Use in built functions and user defined functions as well to implement the program)

   (Eg : Hello-> olleH)   6

   b) Write a function to add two numbers using pointers.   6

c) Write a function named "subtotal" takes as its arguments the following :   8

   i) An array of floating point values;

   ii) An integer that tells the number of cells in the array.

   The function should replace the contents of each cell with the sum of the contents of all the cells in the original array from the left end to the cell in question.

MODULE – III

5. a) What do you understand by enumerated data types ? Explain with examples.   4

   b) Consider a Bank Account class with Acc No. and balance as data members. Write a C++ program to implement the member functions

      get_Account_Details ( ) and display_Account_Details( ). Also write a suitable main function.   8

   c) What are inline functions ? Write an inline function for finding the perimeter of a rectangle.   8

6. a) Explain the following object oriented principles :   6

      i) Encapsulation

      ii) Data abstraction.

   b) Write a C++ program that can take either two integers or two floating point numbers and outputs the smallest number using class, friend functions and function overloading.   9

   c) Explain the use of constructor and destructors in C++ with suitable example.   5
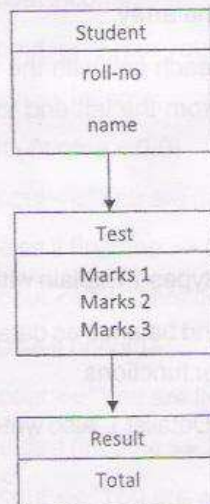
MODULE – IV

7. a) Write a program to dynamically construct a matrix with size n × m. Write functions to add thus obtained matrices.   8

   b) What are virtual functions ? Where are they needed ? Are virtual functions inherited ? Justify your answer with the help of an example.   6

c) Write a C++ program to implement the following :　　　6

```
┌─────────────┐
│   Student   │
├─────────────┤
│   roll-no   │
│    name     │
└─────────────┘
       │
       ▼
┌─────────────┐
│    Test     │
├─────────────┤
│   Marks 1   │
│   Marks 2   │
│   Marks 3   │
└─────────────┘
       │
       ▼
┌─────────────┐
│   Result    │
├─────────────┤
│    Total    │
└─────────────┘
```

8. a) Consider example of book shop which sells books and video tapes. These two classes are inherited from the base class called media. In base class define member functions that are virtual. Write a program which models the class hierarchy for book shop and processes objects of these classes using pointers to base class.　　　8

b) What is the difference between an error and exception ? How is an exception handled in C++ ? Explain with an example.　　　8

c) With a simple example distinguish between early binding and late binding.　　　4