S.E. (Comp.) Semester – IV (Revised 07-08) Examination, May/June 2009

OBJECT ORIENTED PROG. AND DESIGN USING C++

Duration : 3 Hours | Total Marks : 100

Instructions : *i) Answer **any** 5 questions selecting at least **one** from **each** Module.*

*ii) Make necessary assumptions if **required**.*

MODULE – I

1. a) List and explain various restrictions on operator overloading. 6

   b) For each of the following, write statements that perform the indicated task : 5

      i) Output the characters 'P' and 'K' in one statement with ostream function put.

      ii) Print integer 200 in octal, hexadecimal and decimal using stream manipulators.

      iii) Print 4321 right justified in a 10-digit field.

      iv) Use istream member function, write to output 20 characters from a char array 'array1'.

      v) Use stream member function to set the fill character to '%' for printing field widths larger than the values being output. Set field width to 7.

   c) Define the term inheritance. Write a short note on constructors and destructors in derived classes. 5

   d) Distinguish between : 4

      i) Virtual function and pure virtual function

      ii) Static binding and dynamic binding.

2. a) List and explain the stream error states. 6

   b) Write a C++ program that computes area and circumference of circles of different radii. Area should be printed with five digits of precision and circumference should be printed with three digits of precision. Use the formulae :

   Area = pi * r * r

   Circumference = 2 * pi * r

   where pi = 3.14 and r is the value of radius entered by user. The output should be printed in two right justified columns and values in area column should be preceded by their signs. 6

P.T.O.

c) Draw an inheritance hierarchy to illustrate : 4
   i) base class
   ii) indirect base class
   iii) single inheritance
   iv) multiple inheritance.

d) Write a note on overloading prefix and postfix ++ operator. 4

MODULE – II

3. a) Write a C++ program to handle divide-by-zero exception. 5

b) Distinguish between sequential files and random-access-files. 2

c) What does the statement throw; do ? 2

d) List and explain any three file open modes. 3

e) Explain any two : 8
   i) Overloading function templates
   ii) Constructors, destructors and exception handling
   iii) Input/output of objects to a file.

4. a) Explain the use of function set-new-handler to handle new failures. Illustrate with the help of a program. 6

b) Write a C++ program to add, subtract and multiply two numbers (integer or float) using function template. 6

c) Explain standard library exception hierarchy. 6

d) What is an exception specification ? Give example. 2

MODULE – III

5. a) Explain the following functions. Give an example for each. 6
   i) find-first -not-of
   ii) r find
   iii) find-last-of

b) Write a note on iterations in STL. Explain the iterator category hierarchy. 8

c) Write a C++ program to illustrate push, pop and top operations on stack adapter. 4

d) Explain # define preprocessor directive. 2

6. a) What is the difference between splice and merge operations ? Give syntax of each of the above functions. 4

b) Write a note on algorithms in STL. 6

c) Explain the following : 6

i) # error

ii) # include

iii) # pragma.

d) Find errors in each of the following and explain how to correct them : 2

i) String str 1 (27);

String str 2 ('a');

ii) Const char *ptr = name.data();

ptr [3] = '–';

cont << ptr << endl;

e) What will be the output of the following program ? 2

```
# include <iostream>
# include <string>
int main ()
{
String str 1 ("Object Programming");
String str 2 ("Oriented");
Cont << str 1 << endl << str 2 << endl;
Str 1. insert (>, str 2, 0, string : : hpos);
Cont << "after performing insert" << endl;
Cont << str 1;
return 0;
}
```

MODULE – IV

7. a) Define the following terms (**any 4**) : 4
   i) Actor
   ii) Precondition
   iii) Guarantee
   iv) Trigger
   v) Use case
   vi) Scenario.

   b) Distinguish between centralized control and distributed control in a sequence diagram. 2

   c) Draw a state machine diagram for an electric switch. 3

   d) Draw class diagrams for the following : 6
   i) Dependency
   ii) Composition
   iii) Generalization.

   e) Explain in brief the levels of use cases. 5

8. a) Define the following : 3
   i) Time boxing
   ii) Requirements churn
   iii) Query.

   b) Explain the three ways of using UML. 6

   c) Draw a sequence diagram for the following pseudocode : 6

```
Procedure dispatch
For each (item)
    if (product_price > 1000)
      overnight_dispatch
    else
      regular_dispatch
    end if
end for
    if (needs acknowledgement)
      message_confirm
    end procedure.
```

   d) What is multiplicity ? Explain different types of multiplicities used in class diagrams. 5