Code: AC55/AT55   Subject: OBJECT ORIENTED PROGRAMMING

AMIETE – CS/IT (NEW SCHEME)

Time: 3 Hours   **DECEMBER 2011**   Max. Marks: 100

NOTE: There are 9 Questions in all.

- **Please write your Roll No. at the space provided on each page immediately after receiving the Question Paper.**
- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1   **Choose the correct or the best alternative in the following:**   **(2×10)**

a. RunTime polymorphism is achieved by _____

   (A) friend function   **(B)** virtual function
   (C) operator overloading   **(D)** function overloading

b. Which of the following is false for cin?

   (A) It represents standard input.
   (B) It is an object of istream class.
   (C) It is a class of which stream is an object.
   (D) Using cin the data can be read from user's terminal.

c. What will be the result of the expression 13 & 25?

   (A) 38   **(B)** 25
   (C) 9   **(D)** 12

d. What would be the output of the following program?
```
int main()
{
int x,y=10,z=10;
x = (y = =z);
cout<<x;
return 0;
}
```

   (A) 1   **(B)** 0
   (C) 10   **(D)** Error

e. Which of the following operator can be overloaded through friend function?

(A) ->   **(B)** =
(C) ( )   **(D)** *

f. Pure virtual functions

(A) must be redefined in the inherited class
(B) cannot have *public* access specification
(C) are mandatory for a virtual class
(D) None of the above

g. The major goal of inheritance in C++ is:

(A) To facilitate the conversion of data types
(B) To help modular programming.
(C) To extend the capabilities of a class
(D) To hide the details of base class

h. To convert from a user defined class to a basic type, one would most likely use

(A) a built-in conversion function
(B) a one-argument constructor
(C) a conversion function that is a member of the class
(D) an overloaded '=' operator

i. Overloading a postfix increment operator by means of a member function takes

(A) no argument   **(B)** one argument
(C) two arguments   **(D)** three arguments

j. Member functions, when defined within the class specification:

(A) are always inline
(B) are not inline
(C) are inline by default, unless they are too big or too complicated.
(D) are not inline by default

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2   a.   What is Object-oriented programming? Mention a few (atleast five) striking
            features of Object-oriented programming paradigm.   **(6)**

        b.   What is Encapsulation? What are its advantages? How can Encapsulation be
            enforced in C++?   **(5)**

        c.   Illustrate the usage of cast operator by citing suitable examples.   **(5)**

Q.3 a. Write a C++ program to find the sum of digits of a number reducing it to one digit. **(8)**

   b. Write expressions to represent the following:
   (i) p is a function whose argument is a pointer to an array of characters, which returns a pointer to an integer.
   (ii) p is a function whose argument is a pointer to character, which returns a pointer to an array of ten integers. **(4)**

   c. What is the difference between passing a parameter by reference and constant reference? **(4)**

Q.4 Write short notes on the following. Illustrate the concept by giving small C++ program.
   (i)   Reference variables
   (ii) Inline functions
   (iii) Function overloading
   (iv) Recursion in C++ **(4×4)**

Q.5 a. Create a class Time that has separate int member data for hours, minutes and seconds. One constructor should initialize this data to zero and another constructor initializes it to fixed values. Write member function to display time in 12 hour as well as 24 hour format. The final member function should add two objects of class Time. A main() program should create three objects of class time, of which two are initialized to specific values and third object initialized to zero. Then it should add the two initialized values together, leaving the result in the third. Finally it should display the value of all three objects with appropriate headings. **(8)**

   b. List some of the special characteristics of the constructor function. **(4)**

   c. Describe the importance of destructors. Show by an example that the objects are destroyed in the reverse order of creation. **(4)**

Q.6 a. Write a program to overload the unary minus operator using friend function.**(8)**

   b. Explain the concept of operator overloading. Illustrate operator overloading concept by writing a C++ program to concatenate string. **(8)**

Q.7 a. What is visibility in inheritance? Explain the role of protected members in inheritance? **(6)**

   b. The keyword 'virtual' can be used for functions as well as classes in C++. Explain the two different requirement. Illustrate both the concepts by writing C++ program. **(10)**

Q.8   a. Consider the following code segments
Define CUBE(X) ((X)*(X)*(X))
And
Template <class T>
T CUBE (T X)
{return X*X*X}

Explain the difference when CUBE (sqrt(7)) is invoked. Give an example to illustrate that two codes might give different results.   **(4)**

b. When do we use multi catch handlers? Explain with an example.   **(6)**

c. Write a template function to find the maximum number from a template array of size N   **(6)**

Q.9   a. Explain the I/O stream hierarchy in C++.   **(4)**

b. What are the different forms of get() function of istream class? Illustrate the uses by citing proper examples.   **(6)**

c. What is STL? Explain in brief various components of STL.   **(6)**