ROLL NO. _____

**Code: AC55/AT55 Subject: OBJECT ORIENTED PROGRAMMING WITH C++**

## AMIETE – CS/IT

**JUNE 2013**

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

***PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.***

**NOTE: There are 9 Questions in all.**

- **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.**

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

a. Which of the following is not an input/output stream class?

**(A)** ios **(B)** istream
**(C)** ostream **(D)** None of these

b. *return* is an example of a

**(A)** Keyword **(B)** Function
**(C)** Statement **(D)** Comment

c. The *insertion operator* is another name for

**(A)** input operator **(B)** output operator
**(C)** extraction operator **(D)** None of these

d. When you call a function by passing the address of a data variable, it is called _____.

**(A)** call by reference **(B)** call by value
**(C)** call by two directions **(D)** Both **(B)** and **(C)**

e. Which of the following functions in C++ replace the usage of macros in C?

**(A)** friend function **(B)** virtual function
**(C)** inline function **(D)** All of these

f. Consider the following code segment:

```
int main()
{
        double f, *f_ptr=&f;
        f=5.25
        f_ptr=4.5;
        cout<< "Value of f is:" << "  " << f;
        return 0;
}
```

What is the output of the above code?

**(A)** Value of f is: 5.25
**(B)** Value of f is: <hexadecimal address>
**(C)** Value of f is: 4.5
**(D)** Compiler error

g. Which of the following function(s) does allow you to operate data in binary form?

**(A)** write() **(B)** read()
**(C)** get() **(D)** Both **(A)** and **(B)**

h. Which is not associated with Object-oriented programming?

**(A)** Data abstraction **(B)** Automatic initialization
**(C)** Dynamic binding **(D)** Non-data encapsulation

i. Which of the following is true about scope resolution operator?

**(A)** Qualifies a namespace member to its namespace
**(B)** Allows you to access a global variable
**(C)** Qualifies the hidden variable
**(D)** All of these

j. Which of the following is not a member-dereferencing operator?

**(A)** ::* **(B)** ::
**(C)** * **(D)** →*

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

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**Q.2** a. What is meant by Programming Paradigm? Discuss four main programming paradigms. **(8)**

b. What are the three basic logic operators available in C++? Write a small program in C++ that uses these operators and discuss the output of the program.**(8)**

**Q.3** a. Write a program in C++ that print a pattern similar to the following pattern using a for loop.

```
*****
****
***
**
*
```

**(7)**

b. How a multidimensional array can be initialized in C++? Explain various methods by giving suitable examples. **(5)**

c. List four most common conditions that invalidates a pointer value or memory location of a valid item. **(4)**

**Q.4** a. Explain function declaration, function definition and function cell using a suitable example. What is function prototype? **(5)**

b. What do you mean by function overloading? When do we use this concept? Illustrate the concept by writing a C++ program. **(5)**

c. Explain the following:
(i) Return by reference (ii) Pointer to function **(6)**

**Q.5** a. List any three restrictions that apply to class members. **(3)**

b. Is it possible for one class to be a friend of another class? Demonstrate this using a suitable C++ program. **(5)**

c. Why a destructor function in a derived class is executed before the destructor in the base? Write a C++ program that illustrates the order in which constructors and destructors are executed. Also discuss the output. **(8)**

**Q.6** a. Write a C++ program that creates a class called Loc, which stores longitude and latitude values. Overload the '+' operator using a friend function, assignment '=' operator and unary operator '++' relative to this class. **(8)**

b. Write a program to illustrate user-defined conversions in operator overloading. **(4)**

c. Give the syntax of operator overloading for:
(i) Pre-increment (ii) Post increment **(4)**

**Q.7** a. Create a base class called figure that store the dimensions of various geometrical objects and compute their areas. Define a function set_dim( ),a standard member function and show_area( ), a virtual function. Write a C++ program that uses figure to derive three specific classes, called square, triangle, and circle. The program calculates and prints the area of objects belonging to these classes. **(10)**

b. Is it possible to inherit a base class as protected? When this is done, what happens to all public and protected members of the base class become protected members of the derived class? Write a suitable C++ program to demonstrate. **(6)**

**Q.8** a. What is an exception? When do they occur? Illustrate using an example how to provide your own exception handler. **(8)**

b. Can you restrict the types of exception that a function can throw? Can you also prevent that function from throwing any exceptions whatsoever? Explain the concept giving a small C++ routine. **(8)**

**Q.9** a. Define Standard Streams and file streams. Differentiate between two types of stream. **(6)**

b. Write a program in C++ that inputs characters from the keyboard and prints them in reverse case. That is, uppercase prints as lowercase, and lowercase as uppercase. The program halts when a period is typed. **(6)**

c. What do you mean by Containers? Define Sequence and Associative containers. **(4)**