AMIETE – CS/IT (OLD SCHEME)

Code: AC11 / AT22   **Subject: OBJECT ORIENTED PROGRAMMING**
Time: 3 Hours   **Max. Marks: 100**

DECEMBER 2010

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 half an hour 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 best alternative in the following:** (2×10)

a. Identify the operator that is not used with pointers.

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

b. Function template can accept

   (A) any type of parameter   **(B)** only one parameter
   (C) only parameters of basic type   **(D)** only parameters of derived type

c. Run time Polymorphism is achieved by

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

d. In C++, binary operator '+' has associativity from _____

   (A) left to right   **(B)** right to left
   (C) arbitrary   **(D)** depends on usage

e. Inheritance depicts _____ relationship.

   (A) FOR-A   **(B)** IS-A
   (C) HAS-A   **(D)** Friend

f. In C++, a class may have _____ copy constructors.

   (A) no or zero   **(B)** atmost one
   (C) one or more than one   **(D)** more than one

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g. What will be the result of the expression 14 & 23?

  (A) 37   **(B)** 25
  (C) 6   **(D)** 12

h. What would be the output for the following program?

```
#include<iostream.h>
void main( )
{
char *ptr="abcd";
char ch;
ch=++*ptr++;
cout<<ch; }
```

  (A) a   **(B)** b
  (C) c   **(D)** d

i. Exception handling is targeted at

  (A) Run time error   **(B)** Compile time error
  (C) Logical error   **(D)** All of the above

j. An array element is accessed using:

  (A) A FIFO approach   **(B)** An index number
  (C) An operator   **(D)** A member name

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

Q.2 a. Describe the basic characteristics of Object-oriented Programming. **(6)**

  b. What are Inline functions? Give an example. What are the advantages and disadvantages of Inline functions? **(5)**

  c. An election is contested by five candidates. The candidates are numbered 1 to 5 and the voting is done by marking the candidate number on the ballot paper. Write a program to read the ballots and the count the votes cast for each candidate using an array variable count. In case, a number read is outside the range 1 to 5, the ballot should be considered 'spoilt ballot', and the program should also count the number of spoilt ballots. **(5)**

Q.3 a. A friend function can not be used to overload the assignment operator =. Explain why? When is a friend function compulsory? Give an example. **(6)**

  b. Write a program to display only those lines of a file that start with "/*". **(6)**

  c. Why is a destructor function required in class? Can a destructor accept arguments? **(4)**

Q.4 a. Write a program to overload Insertion and Extraction operator.

b. Explain the concept of operator overloading. List various constraints on operator overloading in C++. **(6)**

Q.5 a. What are the two methods of opening a file? Explain with example. What is the difference between the two methods? **(8)**

b. What is multiple inheritance? Write a program that explains how to pass parameters to the constructors of base classes in multiple inheritance. **(8)**

Q.6 a Explain the differences and similarities between macro and inline function. **(6)**

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

c. What are the advantages of **new** operator over **malloc** function? **(4)**

Q.7 Write a note on each of the following giving suitable example: **(4 × 4)**
(i) Compile time Polymorphism
(ii) Run time Polymorphism
(iii) Virtual Functions
(iv) Abstract Class

Q.8 a. Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base class shape. Add to the base class a member function get_data() to initialize base class data members and another member function display_area() to compute and display the area of figures. Make display_area() as a virtual function and redefine this function in the derived classes to suit their requirements. **(6)**

b. Using three classes designed in the **Q8 a** above, write a program that will accept dimensions of a triangle or a rectangle interactively, and display the area. **(6)**

c. Extend the above program to calculate and display the area of circles. **(4)**

Q.9 a. What are generic classes? Why are they useful? Write a function template for sorting a list of arrays. **(10)**

b. What does 'this' pointer points to? Write a C++ program to demonstrate its use. **(6)**