(v) Delegation model is associated with
(a) Garbage Collection (b) awt
(c) Exception Handling (d) Event Handling.

(vi) By repaint(), the method that gets invoked by runtime environment is
(a) actionPerformed() (b) init ()
(c) stop() (d) paint().

(vii) Which one is not a Thread class method?
(a) init (b) paint (c) start (d) run.

(viii) Which of the following permits function overloading on C++?
(a) type (b) number of arguments
(c) both of the mentioned (d) none of the mentioned.

(ix) Pick out the correct statement.
(a) A friend function may be a member of another class.
(b) A friend function may not be a member of another class.
(c) A friend function may or may not be a member of another class.
(d) None of the mentioned.

(x) What will happen while using pass by reference?
(a) The values of those variables are passed to the function so that it can manipulate them
(b) The location of variable in memory is passed to the function so that it can use the same memory area for its processing
(c) The function declaration should contain ampersand (& in its type declaration)
(d) All of the mentioned.

Group - B

2. (a) Write two functions that swap (exchanges the values of) two integers. Use int* as the argument type of the first function and use int& as the argument type of the second function.

(b) What are the differences between structures and classes in C++? What is 'this' pointer?

(c) When is a friend function compulsory for operator overloading? Justify your answer with an example.

4 + (2 + 2) + 4 = 12

3. (a) What is a parameterized constructor? Explain with an example.

(b) Write the output of the following:

```
int* c = new int;
*c = 10;
int* p = c;
*p += 3;
cout << *c << *p;
```

(c) Correct the errors in the following :
You are not allowed to change code where there is no error.

```
string c = "Hello";
string* p = c;
cout << *p;
```

(d) What is the default access for members of C++ class? Describe the various access specifiers that C++ offers.

5 + 2 + 2 + (1+2) = 12

Group - C

4. (a) What is an operator function? Describe operator function with syntax and example. Define a namespace named Constant that contains declarations of some constants.

(b) Write a program that uses the constants defined in the namespace Constant.

(c) Consider a class named as STUDENT with appropriate members. Write a program in C++ to overload stream operators for reading and displaying contents of objects of STUDENT class.

(1 + 3) + 5 + 3 = 12

5. (a) Write the output of the following :

```
vector<char> b(3);
b[0]='r'; b[1]='a'; b[2]='c';
b.push_back('e');
for (int i=2; i>=0; i--)
b.push_back(b[i]);
for (int=0; i<b.size(); b++)
cout << b[i];
```

(b) Explain how base class member functions can be invoked in a derived class if the derived class also has a member function with the same name. Justify the need for virtual functions in this regard.

(c) What are abstract classes? Explain the role of abstract class while building a class hierarchy.

(d) Write a program with following:
A try block to throw exception if condition divide by zero occurs and appropriate catch blocks to handle the exceptions

2 + 4 + 4 + 2 = 12

Group – D

6. (a) What is Byte code in JAVA? Explain constructor overloading in JAVA with an example. How does protected and default access specifiers differ?

(b) What are the restrictions of static methods in JAVA? What is Dynamic Method Dispatch? Explain with example. Is inner class static?

(1+ 3+ 1) + (2 + 4 + 1) = 12

7. (a) Is there explicit need to destroy object in Java? If yes, how is it done? If no, explain how Java takes care of it.

(b) Write a program that writes all the command line arguments received on to the default output.
Does an abstract class have a constructor? Can you create an abstract object using new operator? Give reasons for your answer.

(2 + 4) + (3 + 1 + 2) = 12

Group - E

8. (a) Why do we need interface in Java? How does it differ from abstract class?

(b) What is package? What is the use of it? Why do we need import statement?

(2 + 4) + (2 + 2 + 2) = 12

9. (a) What is the difference between throw and throws? Explain with example. Describe Thread life cycle.

(b) What is Event delegation model? State the differences between applet and application program.

(2 + 1 + 3) + (3 + 3) = 12

OBJECT ORIENTED PROGRAMMING
(CSEN 2103)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) Which of the following is not supported in JAVA?
(a) Single Inheritance (b) Multilevel Inheritance
(c) Multiple Inheritance (d) None of these.

(ii) In Java what is the default priority of a newly created thread?
(a) MIN_PRIORITY (which is defined as 1 in the Thread class.)
(b) NORM_PRIORITY (which is defined as 5 in the Thread class.)
(c) MAX_PRIORITY (which is defined as 10 in the Thread class.)
(d) A thread inherits the priority of its parent thread.

(iii) What is the purpose of method parseInt defined in Integer class?
(a) The method converts an integer to a String.
(b) The method is used to convert String to an integer, assuming that the String represents an integer.
(c) The method is used to convert String to Integer class, assuming that the String represents an integer.
(d) The method converts the Integer object to a String.

(iv) Which of the following is not true about preprocessor directives in C++?
(a) They begin with a hash symbol
(b) They are processed by a pre-processor
(c) They form an integral part of the code
(d) They have to end with a semi colon