CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING
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C++ and Data Structures (60 Minutes)

1 Assume a class D that is privately derived from class B, which of the following can an object of class D located in main() access ?
   1. Public members of B
   2. Protected members of B
   3. Protected members of D
   4. Public members of D

2. A variable that is declared protected
   1. Is visible only in subclasses (and not in the class it is declared in)
   2. Is visible only in the class it is declared in
   3. Is visible to all classes but modifiable only in the class where it is declared
   4. Is visible in the class it is declared in, all its sub classes

3. When two or more objects are derived from a common base class, you can prevent multiple copies of the base class from being present in an object derived from those object by declaring base class when it is inherited
   1. Public
   2. Protected
   3. Virtual
   4. Private

4. The Restriction that apply to friend function is
   1. Friend function can not access private members
   2. Friend function can not access private and public members
   3. Both 1 and 2 are correct
   4. A derived class does not inherit friend function

5. Function overloading and operator overloading comes under
   1. Run time polymorphism
   2. Compile time polymorphism
   3. Both a and b are correct
   4. None of the above

6. The Capability of the operator to work on different types of operand is referred as
   1. Inheritance
   2. Polymorphism
   3. Encapsulation
   4. None of the above

7. How can we differentiate between a Pre and Post increment operator while overloading
   1. Mentioning the keyword int as the parameter in the post increment form of the operator ++()
   2. Mentioning the keyword int as the parameter in the pre increment form of the operator ++()
   3. No, we can not differentiate
   4. None of the above

8. What is difference between copy constructor and assignment operator
   1. Copy constructor create a object, assignment operator does not create a object
   2. Copy constructor does not create a object, assignment operator create a object
   3. Copy constructor is used to initialize object, assignment operator is used to initialize only variables
   4. There is no difference between copy constructor and assignment operator

9. VTABLE contains
   1. addresses of virtual functions
   2. addresses of virtual pointers
   3. address of virtual table
   4. None of the above

10. What is upcasting
   1. storing the address of VTABLE in VPTR
   2. storing the address of virtual functions in VPTR
   3. storing the address of base class object in base class pointer
   4. storing the address of derived class object in the base class pointer

11. Virtual function calls are implemented through
   1. Early binding
   2. Late binding
   3. Both 1 and 2 are correct
   4. None of the above

12. If we do not override virtual function in derived class then
   1. VTABLE of the derived class would contain the address of base class virtual function
   2. VTABLE of the base class would contain the address of derived class member function
   3. VPTR would not contain the address of VTABLE
   4. None of the above

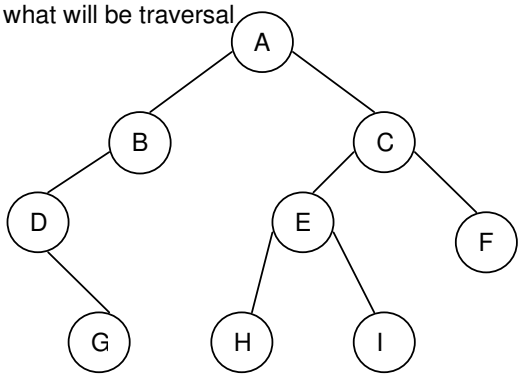
13. Namespace definition can only appear at
   1. global scope
   2. local scope
   3. both local scope and global scope
   4. None of the above

14. RTTI is used to find out
   1. The address of class
   2. The address of static member function
   3. The exact type of object using a pointer or reference to the base class
   4. The address of virtual function

15. Adding an element to the stack means
   1. placing an element to the front end
   2. placing an element at the top
   3. placing an element at the rear end
   4. None of the above

16. The end at which a new element gets added to queue is called
   1. Front
   2. Rear
   3. Top
   4. Bottom

17. If we traverse a following tree in Pre order then what will be traversal



    1. ABDGCEHIF
    2. ABDGHEICF
    3. ABDGFCIEH
    4. None of the above

18. The advantage of link list over array is
    1. Link list can grow and shrink in size during life time
    2. Less space is required for storing elements
    3. Both 1 and 2 are correct
    4. None of the above

19. Which one of the following algorithm is NOT an example of divide and conquer technique
    1. Quick Sort
    2. Merge Sort
    3. Bubble Sort
    4. Binary Search

20. What will be the output of the following code

```
#include<iostream.h>
void main()
{
        char *p=”hello”;
        char *q=p;
        cout<<p<<endl<<q;
        q=”goodbye”;
        cout<<endl<<p<<endl<<q;
}
```

    1. hello
hello
goodbye
hello
    2. hello
hello
hello
goodbye
    3. hello
hello
goodbye
goodbye
    4. None of the above

21. What will be the wrong with the following code

```
class a
{
  int i;
}
  main()
{
  //code
}
```

    1. there should be semicolon after the class declaration
    2. the return type of the main should be specified
    3. No error. Class a is considered as return type of main()
    4. None of the above

22. What will be the output of the following code

```
#include<iostream.h>
#define MAXROW 3
#define MAXCOL 4
void main()
{
        int (*p) [MAXCOL];
        p=new int[MAXROW][MAXCOL];
        cout<<endl<<sizeof(p)<<endl<<sizeof(*p);
}
```

    1. 2(under Dos) or 4(under Linux)
8(under Dos) or 16(under Linux)
    2. 4(under Dos) or 8(under Linux)
8(under Dos) or 16(under Linux)
    3. compilation error
    4. runtime error

23. Object oriented design decomposes a system into
    1. Classes
    2. Objects
    3. Structures
    4. Methods

24. If a class member function is declared a const, the function.
    1. Does not change the value of any data member of that class
    2. Does not change the value of any data member of implied object
    3. All of the above
    4. None of the above

25. What is the output of the program?

```
#include <stdio.h>
float cal (float value)
{
   return (3 * value);
}
void main()
{
   int a = 10;
   float b = cal ("123");
}
```

    1. 369
    2. 123
    3. Compilation error - Cannot convert from char to float
    4. None of the above

26. What is the output of the program?

```
#include <iostream.h>
void main ()
{
        for(int j = 1, sum = 0; j < 5; j++)
        sum += j;
        sum = j;
        cout << sum;
}
```

    1. 5
    2. 10
    3. Compilation error. Undefined variable sum and j
    4. 6

27. Which one supports unknown data types in a single framework?
    1. Inheritance

2. Virtual functions
3. Templates
4. Abstract Base Class

28. Which of the following is false about struct and class in C++?
    1. The members of a struct are public by default, while in class, they are private by default
    2. Struct and class are otherwise functionally equivalent
    3. A class supports all the access specifiers like private, protected and public
    4. A struct cannot have protected access specifier
29. Protected keyword is frequently used
    1. For function overloading
    2. For protecting data
    3. For inheritance
    4. For security purpose
30. Abstract base class is one, which has
    1. All virtual functions
    2. At least one pure virtual function
    3. Functions with abstract keyword
    4. No pure virtual functions
31. What is the output of the program?

```
#include <iostream.h>
inline int max(int x, int y)
{
   return(x > y ? x : y);
}
   void main()
{
    int(* max_func)(int,int)=max;
   cout << max_func(75,33);
}
```

    1. 75
    2. Error - Undefined symbol max_func
    3. 33
    4. None of the above
32. Which keyword is used to decide on the choice of function or method at runtime?
    1. abstract
    2. virtual
    3. protected
    4. static
33. Which of the following is a correct statement?
    1. Abstract class object can be created
    2. Pointer to abstract class can be created
    3. Reference to abstract class can be created
    4. Both 2 and 3
34. What is the output of the following?

```
#include <iostream.h>
int add(int, int = 5, int = 10);
void main() {
      cout << add(10) << " " << add(10, 20) << " "
      << add(10, 20, 30);
}

int add(int a, int b, int c)
{
     return a + b + c;
}
```

    1. compilation error
    2. 25 40 60
    3. 15 30 60
    4. 20 40 60
35. What is the output of the program?

```
#include <iostream.h>
 char *buf1 = "Genesis", *buf2 = "InSoft";
 void main()
 {
    char* const q=buf1;
    *q='x';
    cout << *q;
 }
```

    1. x
    2. xenesis
    3. Runtime Error
    4. None of the above
36. What happens when new operator is called?
    1. It invokes operator new, then invokes the constructor and then does type casting
    2. It invokes the constructor, calls operator new and then does type casting
    3. It invokes operator new and then invokes the constructor
    4. It invokes the constructor and then does type casting
37. Which of the following are true about default arguments?
    1. Default arguments must be the last argument
    2. A default argument cannot be redefined in later declarations even if the redefinition is identical to the original
    3. Additional default arguments can be added by later declarations
    4. All of the above
38. What is the output of the program?

```
#include <iostream.h>
main()
{
int a=5, b=10;
if (a=b)
cout<<"Hi";
else
cout<<"Hello";
cout<<"Bye"<<a;
}
```

    1. HiBye10
    2. HelloBye10
    3. HiBye5
    4. Bye10
39. What is the output of the program?

```
#include <iostream.h>
class A
{
  static int x;
  public:
  A()
  {
  x=5;
  }
  void show()
  {
  cout<<x;
  }
};

int A::x=10;

void main()
```

```
{
  A obj[5];
  obj[1].show();
}
```

1. 5
2. 10
3. Compiler error
4. Undefined

40. A graph is said to be a tree, if it satisfies which of the properties:
    1. If it is connected and there are no cycles in the graph.
    2. If it is not connected and there are cycles in the graph
    3. If it connected and there are cycles in the graph
    4. None of the above

41. Null Pointer is used to tell
    1. End of linked list
    2. Empty pointer field of a structure
    3. The linked list is empty
    4. All of the above
42. Hashing refers to the process of deriving
    1. A record key from storage address
    2. Storage address from a record key
    3. A floating-point code from a record key
    4. None of the above
43. The inorder traversal of some binary tree produces the sequence DBEAFC, and the postorder traversal of the same tree produced the sequence DEBFCA. Which of the following is a correct preorder traversal sequence?
    1. DBAECF
    2. ABEDFC
    3. ABDECF
    4. None of the above
44. How many cycles should be contained in a tree?
    1. 0
    2. at least 1
    3. any number
    4. None of the above
45. If graph G has no edges then corresponding adjacency matrix is
    1. unit matrix
    2. zero matrix
    3. matrix with all 1's
    4. None of the above
46. What is not true for linear collision processing?
    1. It is easier to program
    2. It may include more collision
    3. It requires space for links
    4. All are true
47. In an adjacency matrix parallel edges are given by
    1. Similar columns
    2. Similar rows
    3. Not representable
    4. None of the above
48. The element at the root of heap is
    1. largest
    2. smallest
    3. depending on type of heap it may be smallest or largest
    4. None of the above
49. A dynamic data structure where we can search for desired records in O(log2n) time is
    1. heap
    2. binary search tree
    3. circularly linked list
    4. array
50. We can efficiently reverse a string using a
    1. linear queue
    2. circular queue
    3. stack
    4. doubly linked list