DSCE
DEPARTMENT OF INFORMATION SCIENCE

DAYANANDA SAGAR COLLEGE OF ENGINEERING
DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

QUESTION BANK

Subject: OOPS With C++ **Subject code: 18IS4DCOOP**

UNIT I- Introduction

1. Describe the following characteristics of Object Oriented Programming

i) Encapsulation ii) Polymorphism iii) Inheritance (10 Marks)

2. Write the general form of function. Explain the different types of argument passing techniques, with example. (10 Marks)
3. Discuss function prototyping, with an example. Also write its advantages. (10 Marks)
4. Define 'this' pointer, with an example, indicate the steps involved in referring to members of the invoking object. (10 Marks)
5. State the important features of Object Oriented Programming. Compare the Object Oriented system, with Procedure Oriented system. (10 Marks)
6. What is function overloading? Write a program in C++ to overload the function add(S1,S2) where S1 and S2 are integers and floating point values. (10 Marks)
7. What is function overloading? Write a C++ program to define three overloaded functions area(), to find area of rectangle, area of rectangular box and area of circle. (10 Marks)
8. What is an inline function? Explain the working of inline functions with its general syntax, merits and demerits. (10 Marks)
9. What is a structure? Explain with example how entire structure can be passed to functions. (10 Marks)
10. Define objects. Create a class FLOWER with following characteristics: Name, Color, Price. Display the names of all flowers costing more than 25 rupees. (10 Marks)
11. Explain class and objects. With the help of example explain how data hiding and encapsulation characteristics are achieved in C++. (10 Marks)
12. Write a C++ program to define a class called box with length, breadth and height as data members, and input( ),print( ) and volume( ) as member function. (10 Marks)

UNIT 2-Classes & Objects – I

1. What is class? How it is created? Write a C++ programme to create a class called employee with data members: name, age, salary. Display at least '5' employee information. (10 Marks)
2. Differentiate between class and objects. Write a C++ program to define a class called TIME with hour, minute and second as data members and read (), display() and add() as member functions. (10 Marks)
3. What are constructors? How is a constructor different from member function? Illustrate with example. (10 Marks)
4. What is Data hiding? How is it achieved in C++ ? Explain with example. (10 Marks)
5. Explain how you can overload member functions with an example. (10 Marks)
6. How can member functions be made inline? Give an example? (10 Marks)
7. Write a C++ program to sort the list of students depending on their roll numbers. (10 Marks)
8. What are friend non-member functions and friend member functions? Explain with suitable examples (10 Marks)
9. Write a C++ program to count the number of objects of a certain class. (10 Marks)
10. What is a friend class? Illustrate friends as bridges. (10 Marks)
11. What are nested classes explain with suitable example. (10 Marks)
12. What is a constructor? What are its characteristics? Define a suitable parameterized constructor with default values for the class box with data members length, breadth and height. (10 Marks)
13. What are constructors and destructors? Explain the different types of constructor with suitable example. (10 Marks)
14. What is static data member? Explain its general syntax with suitable example program. (10 Marks)
15. What is destructor? Explain its prototype with example program. What is the difference between constructors and destructors (10 Marks)
16. What is static member function? Explain with example program. (10 Marks)
17. What is class? Explain 2 different ways of defining member function. (10 Marks)

18. Explain the various applications of scope resolution operator with suitable examples. (10 Marks)

UNIT 3 - Operator Overloading

1. What are friend functions? Explain the need of friend functions in C++ with suitable example. (10 Marks)
2. What is the use of operator overloading? Write a program to overload the following operators:

   i) Pre-increment ii) Post-increment iii) Post-decrement (10 Marks)
3. What is friend class? Explain with suitable example program. (10 Marks)
4. Explain with suitable programs how objects are passed and returned as arguments to function? (10 Marks)
5. What is copy constructor? Explain its general syntax with suitable program. (10 Marks)
6. Explain the usage of Template function. (10 Marks)
7. Write a C++ program to swap two integer and floating point numbers, using a friend template. (10 Marks)
8. What are generic classes? Explain its general syntax with suitable example program. (10 Marks)
9. What is operator overloading? Write a program to overload + and - operator using friend function (10 Marks)
10. What is operator overloading? Write a C++ program to add two complex numbers by overloading the + operator. Also overload the >>and << operators for reading and displaying the complex numbers. (10 Marks)
11. What are the major advantages of using friend functions in C++. Write a program to overload << and >> operators using friend function. (10 Marks)

UNIT 4- Inheritance – I

1. Explain the visibility of the base class members, for the access specifiers: private, protected and public while creating the derived classes. (10 Marks)
2. Differentiate between private members and protected members. Write a C++ program to illustrate protected members in the base class. (10 Marks)

3. With an example explain multiple inheritance. (10 Marks)

4. What is inheritance? How to inherit a base class as protected? Explain the inheriting multiple base classes. (10 Marks)

5. Explain with example base class access control. (10 Marks)

6. Explain the order in which constructors and destructors are inherited. (10 Marks)

7. Can friendship be inherited? Explain with example. (10 Marks)

8. What is inheritance? Mention different kinds of inheritance. Explain any two. (10 Marks)

9. Discuss with examples, the implications of deriving a class from an existing class by the 'public' and 'protected' access specifiers. (10 Marks)

10. How are multiple base classes inherited. Explain with suitable example (10 Marks)

11. Explain the different ways in which derived class can inherit the base class and its effect based on the access specifiers. (10 Marks)

12. Write a C++ program to create a class called EMPLOYEE with five data members. Using inheritance, create class PART-TIME EMPLOYEE and FULL-TIME EMPLOYEE having respective data members. Using the concept of inheritance calculate the wages of PART-TIME EMPLOYEE and FULL-TIME EMPLOYEE (10 Marks)

1. What is function overriding? Give an example. Justify the statement: "function overriding is a form of function overloading" (10 Marks)

2. Write a C++ program to initialize base class members through a derived class constructor. (10 Marks)

3. Write a C++ program to create a class STUDENT with data members USN, name and age. Using inheritance, create class UGSTUDENT having fields semester, fees and stipend. Enter data for atleast 5 students and compute the semester wise average age for UG students. (10 Marks)

4. What are the ambiguities that arise when multiple base classes are inherited? How can they be removed? Explain the above with suitable programs. (10 Marks)

5. Explain the concept of inheriting from multiple base classes with suitable example. (10 Marks)

6. With an example explain the order of invocation of constructors and destructors and passing arguments to base class constructors in multilevel inheritance. (10 Marks)

7. What are the ambiguities that arise in multiple inheritance? How to overcome this? Explain with examples. (10 Marks)
8. Explain with example, "granting access" with respect to inheritance. (10 Marks)
9. Explain the method of passing parameters to base class constructor. (10 Marks)
10. What are virtual base classes explain with suitable example. (10 Marks)
11. Write a program to show the effect of virtual base classes (10 Marks)
12. Write a program having three ambiguities of multiple inheritance and explain how it can be overcome (10 Marks)
13. Explain the benefits of pure virtual function with suitable example. (10 Marks)

UNIT 5-Virtual functions & Class Templates

1. What are virtual functions? What is the need for virtual function? How is early binding different from late binding? (10 Marks)
2. What is pure virtual function? Explain with an example. (10 Marks)
3. How to inherit a virtual attribute? Explain with suitable program. (10 Marks)
4. Write a C++ program to create a base class called shape. Use this class to store two double type values that could be used to compute area of figures. Derive two specific classes called triangle and rectangle from the base 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 derived classes to suit their requirements. (10 Marks)
5. Write a C++ program to create a base class called number with an integer data member and a member function to set the value for this data member. Derive three classes from this base class called hexadecimal, decimal and octal. Include a member function show() in all these three derived classes to display the value of the base class data member in hexadecimal, decimal and octal respectively. Use the concept of pure virtual functions. (10 Marks)
6. Explain how you can define pure virtual functions with an example. (10 Marks)
7. Explain how you can create virtual functions with an example (10 Marks)
8. Define and give the syntax for the following: (10 Marks)

i) Virtual function ii)Pure virtual function iii)abstract base class

9. Write an example program to call a virtual function through a base class reference. (10 Marks)

10. Write an example program to call a virtual function through a base class pointer. (10 Marks)

11. What is pure virtual function? Differentiate between virtual function and pure virtual function. (10 Marks)

12. Differentiate between early and late binding. (10 Marks)

13. Explain how Virtual attribute is inherited with example program. (10 Marks)

14. What are abstract classes? Explain the same with an example program. (10 Marks)