

B.Sc. II YEAR Computer Science (For Regular Students)

Paper	Subjects	Internals			Theory	Total (B)	Total A+B	Practical	Grand Total
		3 Months	6 Months	Total (A)					
I	Object Oriented Programming using C++ and Java	10	10	20	40	80	100	50	150
II	Data Structures and Software Engineering				40				

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B.Sc. II YEAR COMPUTER SCIENCE
PAPER I
OBJECT ORIENTED PROGRAMMING USING C++ AND JAVA

Course Objective: To understand concepts of Object-Oriented Programming Language like classes, objects, polymorphism, memory management and garbage collection, inheritance using C++. Course is further extended to understand the process management using thread and creating GUI application in platform independent environment using java.

Course Outcome: Student will be able to implement classes, object, inheritance, reusability, security and many more OOPS tricks for better and effective programming in C++ and Java. Multithreading gives an opportunity to learning process working. Applet provided students to create their internet and user-friendly application.

UNIT-I

Introduction to C++: Programming paradigms, Key concepts of object-oriented programming, advantages of OOP's. Input and output in C++: pre-defined streams, formatted and unformatted console I/O operations, parts of C++ program, types of tokens: keywords, identifiers, data types, constants, operators, precedence of operators, referencing and dereferencing operators, and scope access operator. Control statements.

UNIT-II

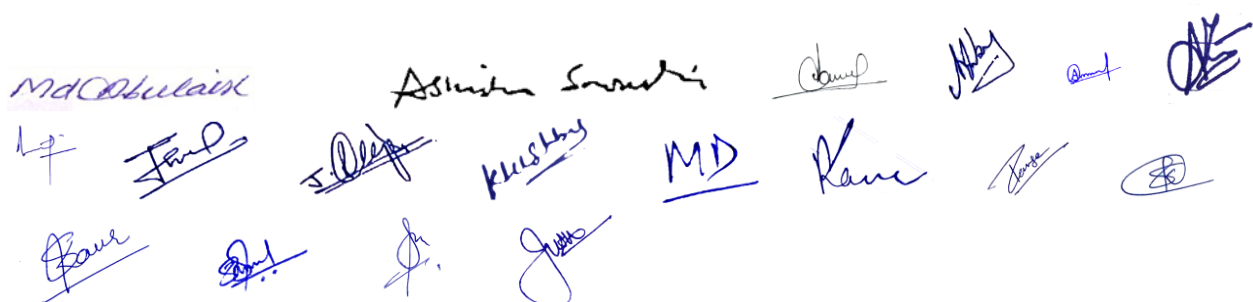
Functions: main(), parts of function, passing. Arguments: value, address, reference, inline functions, Function Overloading: Principles, precautions, library functions. Classes and objects: declaring classes and objects, accessing class members, Visibility Controls, defining member function: member function inside the class, member function outside the class, static members, friend function, friend class, overloading member function. Constructor: characteristics, applications, types of constructor, constructor overloading, Destructor.

UNIT-III

Operator overloading: overloading unary operator, binary operator. Inheritance: public, private and protected inheritance, types of inheritances: single, multiple, hierarchical, multilevel, hybrid, multipath, virtual base class. Pointers: pointer declaration, pointer arithmetic, pointer to class & object, Array: declarations & initialization, arrays of classes. Polymorphism: static (Early) binding, dynamic (Late) binding, virtual function, pure virtual function.

UNIT-IV

C++ vs JAVA, JAVA environment, Structure of Java, JAVA virtual machine. Define a Class, Adding Variables and Methods, Creating Objects, Accessing Class Members, Constructors, Method Overloading, Static Members, Nesting of Methods. Arrays: One Dimensional & two Dimensional, Strings, Vectors, Wrapper Classes. Define Interface, Extend Interface, Implement Interface, Package: in-built and user defined packages.



A collection of approximately 15 handwritten signatures in blue ink, arranged in three rows. The signatures are of various styles, including 'Md Abdulain', 'Ashish Sankar', 'MD', 'Ravi', and others.

4. Write a program in java, create class product as abstract class. Create another class fan which must inherits product class.
5. Write java program, create a class string_calculate and implement following methods: toLowerCase, toUpperCase, toString, substr, equals, equalsIgnoreCase, toCompare, chatAt, trim, indexOf.
6. Write a program in java to that show implementation of Interface.
7. Write a program in Java to show implementation of Applet.
8. Write a program in Java to show implementation of Thread.
9. Write a program in java to that show implementation type casting.
10. Write a program in java to that show implementation final class.

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different life-cycle models. Requirement Analysis and Specification: Properties of a good SRS document. DESIGN CONCEPTS AND PRINCIPLES: Cohesion, Coupling and Functional Dependence, need of function independence, function-oriented design and object-oriented design, DFD model of a system.

UNIT-V

PROJECT ESTIMATION: Project planning, Metrics for software project size estimation: Lines of Code (LOC), Function point (FP), Limitations of function point (FP) metric. PROJECT ESTIMATION TECHNIQUES: Empirical estimation techniques - COCOMO Model SOFTWARE TESTING FUNDAMENTALS: Black Box Testing - equivalence class partitioning, Boundary Value Analysis. White Box Testing, Control flow graph, Cyclomatic complexity. SOFTWARE TESTING STRATEGIES: Unit Testing, Regression Testing, System Testing: Alpha and Beta Testing, Integration testing, Recovery Testing, Stress Testing, Performance Testing.

Text Books:

1. Software Engineering: A Practitioner's Approach, Author: Roger S. Pressman
2. Data Structures Through C (A practical Approach), Author: G.S. Baluja
3. An Integrated Approach to Software Engineering Author: Pankaj Jalote

Reference Books:

1. Data Structures using C++ Author: D.S. Malik Second Edition
2. Principles of Data Structures using C and C++ Author: Vinu V Das New Age International Publishers
3. A Practical Introduction to Data Structures and Algorithm Analysis Author: Clifford A. Snaffer Third Edition (Java)
4. Data Structures and Algorithms Made Easy Narasimha Karumanchi

Practical List

1. Write a program to find the factorial of a given number using recursion
2. Write a program to find GCD using recursion
3. Write a program for bubble sorting
4. Write a program for linear search
5. Write a program for binary search
6. Write a program for selection sorting
7. Write a program for quick sorting
8. Write a program for insertion sorting
9. Write a program to print Fibonacci series using recursion
10. Write a program to perform insertion and deletion operation on stack
11. Write a program to perform insertion and deletion operation on queue using static implementation

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12. Write a program to perform insertion and deletion operation on queue using dynamic implementation
13. Write a program to insert a node at the beginning in singly linked list.
14. Write a program to insert a node at the middle of singly linked list
15. Write a program to insert a node at the last of singly linked list
16. Write a program to delete a node from the beginning of singly linked list
17. Write a program to delete a node from the middle of singly linked list
18. Write a program to delete a node from last in the singly linked list.
19. Write a program to traverse all the nodes in singly linked list.
20. Write a program to insert a node in the beginning of circular linked list.
21. Write a program to insert a node in the last of circular linked list.
22. Write a program to evaluate postfix operation.

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