|  |  |  |
| --- | --- | --- |
| **Module -1** | **Sl No.** | 1. **Java Fundamentals** |
|  | Describe the general structure of a simple Java Program |
|  | Name the Principles of OOPs. Explain |
|  | Explain the key attributes of Java programming language. |
|  | What is JVM? Why do we need it? |
|  | What is Java development kit and java runtime environment? |
|  | What is Keywords and Identifiers? List the rules to write an identifier. |
|  | Explain the following :   1. Bytecode 2. Javac utility 3. Java utility |
| 1. **Introducing Data types Operators** | |
|  | Discuss various data types used in Java. |
|  | What is type Conversion and Casting? Explain automatic type promotion in expressions with rules and demo program. |
|  | Explain the term with an example:   1. >>> 2. Left shift 3. Bitwise operators 4. && 5. Right Shift |
|  | 1. **Program Control Statements** |
|  | What are the ways input characters from the keyboard? Explain |
|  | Discuss the Conditional Statements (all if statements) with an example. |
|  | Explain different types of Iteration Statements (while, do-while, for) and Jump Statements  ( break, continue) with an example. |
|  | Explain for-each loop with an example. |
|  | Explain multi-way conditional statement (switch) with syntax. Give an example |
|  | Explain usage of break with label and continue with label with an example. |
|  | 1. **Introducing Classes, Objects and Methods** |
|  | Define class. Give its general form. |
|  | What are objects? How objects are created? |
|  | What are constructors? Explain types of constructors |
|  | Explain the usage of “this” keyword. |
|  | Explain the following:   1. finalize() 2. “this” keyword |

|  |  |  |
| --- | --- | --- |
|  |  | **5.More Data Types and Operators** |
|  |  | What are Arrays? Explain different types of an array. |
|  |  | How many ways an array can be initialized? Explain with a syntax. |
|  |  | What are Irregular array? Write a program to find the sum of all the elements in an Irregular array. |
|  |  | Write a short note on length member in an array. |
|  |  | **6.Strings** |
|  | 1. | What are the three string-related languages features |
|  | 2 | Explain obtaining the characters within a string |
|  | 3 | Explain 5 methods to compare string |
|  | 4 | String indexOf and lastindexOf() |
|  | 5 | What are the methods to obtain a modified string |
|  | 6 | Short notes on |
|  |  | Length() |
|  |  | Uppercase and lowercase method |
|  |  | indexOf and lastindexOf |
|  | 7 | Difference between String Buffer and String |
|  |  |  |
| **Module -2** |  | **1 : A Closer look at methods** |
| 1 | Explain how arguments are passed in the method |
| 2 | Define recursion. Write a program to search a key using binary search, factorial, Fibonacci |
| 3 | Explain static method , static variable, static block |
| 4 | What are nested class? Give its general form. What are the types of nested classes? |
| 5 | Explain how to create instance of inner class. |
| 6 | With suitable program. Explain varargs in java. |
|  | **2: Inheritance** |
| 1 | Describe the various forms inheritance |
| 2 | Demonstrate a program. How to achieve run time polymorphism |
| 3 | What is dynamic method dispatch? Demonstrate with example |
| 4 | Explain the uses of super keyword |
| 5 | Explain how super class constructor are called using super keyword. |
| 6 | Uses of final(final class, final variable, final method) |
| 7 | Object class |
| 8 | Abstract class |
| **Module-3** |  | **1: Interface** |
|  | What are interfaces? Write a program to implement multiple interfaces |
|  |  |
|  |  |

**Programs List**

|  |  |
| --- | --- |
|  | Write a program to convert from uppercase to lowercase using bitwise operator. |
|  | Write a program to convert from lowercase to uppercase using bitwise operator. |
|  | Write a program to print the following pattern  A  A B  A B C  A B C D |
|  | Write a program to display bits within a byte(for Integer type) |
|  | Write a program to find minimum and maximum element of an array. |
|  | Write a program to searching an element of an array. |
|  | Write a program to sort elements of an array. |
|  | Write a program to sum all elements in an array. |
|  | Write a program to Transpose of Matrix. |
|  | Write a program to sum of diagonal elements of a matrix. |
|  | Write a program to multiplication of two matrix. |