P.V.P. SIDDHARTHA INSTITUTE OF TECHNOLOGY	
BRANCH: Common to CSE, IT, CSE (AI&ML), CSE (Data Science))	**Regulations: PVP23**
Program: B. Tech	**Course: OBJECT ORIENTED PROGRAMMING THROUGH JAVA**
Course Code: 23CS3302/23IT3302/23AM3302/23DS3302	**Year and Semester: II Year-I Sem**
QUESTION BANK	

UNIT I
Short Answer Questions (2 Marks Each)

Q. NO.	QUESTIONS	CO	Bloom's Level	MARKS
1	Define the term "Object-Oriented Programming" and list out the principles of object-oriented programming.	CO1	L1	2M
2	What is the purpose of the final keyword in Java?	CO1	L2	2M
3	Demonstrate command line arguments by writing a program that accepts two numbers from the command line, adds them, and prints the result.	CO1	L2	2M
4	Explain why the main method is defined as static, public with an array of strings as an input argument.	CO1	L2	2M
5	Write a Java program that reads a line of text from the user and counts the number of vowels in the input	CO1	L2	2M
6	What methods of the Scanner class are used to read an integer and string input from the user? Explain with examples.	CO1	L2	2M
7	Explain the precedence and associativity of arithmetic operators in Java. Evaluate the expression " 100 / 10 * 2 + 5 - 3 % 2"and determine the result.	CO1	L2	2M

8	Explain about formatted output and write a Java program that takes a user's name, age, and GPA as input and prints this information in a formatted manner.	CO1	L2	2M
9	Explain the differences between print(), println(), and printf() methods in Java. Write a Java program to demonstrate the use of each of those methods.	CO1	L2	2M
10	Illustrate the usage of for-each loop by writing a Java program to iterate over an array of integers and calculate the sum of all elements.	CO1	L2	2M

Long Answer Questions (10 Marks Each)

Q. No.		QUESTIONS	CO	Bloom's Level	Marks
1	(a)	Explain the structure of a basic Java program, including the purpose of the main method and the importance of class definitions. Discuss how comments and escape sequences contribute to program readability and functionality.	CO1	L2	5M
	(b)	Discuss how conditional statements are used in the program to determine the tax amount. Write a Java program to calculate the tax on a salary. The program should prompt the user to enter their annual salary. Use the following tax brackets: No tax for salaries up to 2,50,000 rupees, 5% tax for salaries between 2,50,001 and 5,00,000 rupees, and 10% tax for salaries above 5,00,000 rupees. Display the tax amount based on the entered salary.	CO1	L2	5M
2	(a)	Explain the concept of final variable, method and class using examples.	CO1	L2	5M
	(b)	Demonstrate the use of a static variable to maintain the count of method calls. Write a java program to create a logging	CO1	L2	5M

		utility that tracks how many times a particular method is called throughout the application.			
3	(a)	Explain the concepts of scope and lifetime in Java. Write a Java program that demonstrates the scope and lifetime of variables.	CO1	L2	5M
	(b)	Illustrate the difference between Procedural Oriented and object oriented programming.	CO1	L2	5M
4	(a)	What are java buzzwords? Give a brief description.	CO1	L2	5M
	(b)	Explain about Command line arguments. Write a java program to accept student marks as command line arguments and calculate the sum, percentage and grade of student.	CO1	L2	5M
5	(a)	Explain symbolic constants in Java and how they differ from literal constants. Write a program using symbolic and literal constants to calculate the final price of an item after applying a discount.	CO1	L2	5M
	(b)	Is Java a pure object-oriented program or not? Justify your answer.	CO1	L2	5M
6	(a)	Demonstrate implicit and explicit type casting with an example program.	CO1	L2	5M
	(b)	Explain about formatted input and output statements. Write a Java program that takes the name, quantity, and unit price of a product as input and prints a receipt showing the total price, formatted to two decimal places.	CO1	L2	5M
7	(a)	List and explain the Data types in Java program with examples.	CO1	L2	5M

	(b)	Explain the difference between static and final keywords in Java. Illustrate your explanation with an example	CO1	L2	5M
8	(a)	List and explain the features of Java language.	CO1	L2	5M
	(b)	Write a Java program to find the first even and last odd number in an array of integers and print it	CO1	L2	5M
9		Explain the different types of tokens. Write a Java program that incorporates tokens to create a simple calculator that performs basic arithmetic operations and displays the result.	CO1	L2	10M
10	(a)	Explain the concepts JDK, JRE and JVM.	CO1	L2	5M
	(b)	Explain different iterative statements available in Java.Write a Java program to track book loans in a library. The program should prompt the user to enter the following for each borrowed book: ● The number of books borrowed. ● The number of days each book was borrowed. ● The number of days each book was returned before the due date. Assume that the user will be charged 1 rupee per day for borrowing each book. If a book is returned before its due date, a 10% discount will be applied to the total charge for that book. Calculate and display the total charge for all books after applying any discounts.	CO1	L2	5M

UNIT II
Short Answer Questions (2 Marks Each)

Q. NO.	QUESTIONS	CO	Bloom's Level	MARKS
1	What is the purpose of the public and private access modifiers in Java classes?	CO2	L2	2M

2	What is a constructor in Java? How is it different from a method?	CO2	L2	2M
3	What is the String class in Java? How does it differ from the StringBuilder class?	CO2	L2	2M
4	List and briefly describe two methods of the String class that can be used to modify a string.	CO2	L2	2M
5	Explain the term object. Write a simple Java program that declares a class “Book” with attributes “title” and “author”. Create two Book objects and demonstrate how to assign the values of one Book object to another and print their attributes.	CO2	L3	2M
6	What “this” pointer? Write a Java class “Employee” with attributes “name” and “salary”. Use “this” keyword within a method to display the current object’s attributes.	CO2	L3	2M
7	Create a Java class “Product” with private “productCode”, “price” attributes, and use getter and setter methods to access and modify these attributes in a main program.	CO2	L3	2M
8	What is method overloading? Write a simple java program to demonstrate method overloading.	CO2	L2	2M
9	Explain how the “charAt” method works in the String class. Provide a simple example.	CO2	L2	2M
10	Write a Java program that takes a string input from the user and replaces all occurrences of a specified character with another character. Print the modified string.	CO2	L3	2M

Long Answer Questions (10 Marks Each)

Q. NO.		QUESTION	CO	Bloom’s Level	MARKS

1	(a)	Create a Java program that reads a string from the user and performs the following operations: find the length of the string, convert it to uppercase, and search for a specific substring. Use String methods to accomplish these tasks and print the results.	CO2	L3	5M
	(b)	What is constructor overloading? Write a java program to demonstrate constructor overloading	CO2	L3	5M
2		Explain the concept of class declaration and modifiers in Java. Write a Java program to define a class "Library" with public and private members. Demonstrate the use of public, protected, and private access modifiers by creating a Library object and accessing its members from another class.	CO2	L3	10M
3		What is a Nested class? Explain the different types of nested classes. Write a program to demonstrate each of the nested class types with an example.	CO2	L3	10M
4		Explain the "CharSequence" interface in Java. What are its key methods, and how does it relate to other classes such as String, StringBuilder, and StringBuffer? Write a Java program using the "CharSequence" interface to display the sub-sequence of the taken string.	CO2	L3	10M
5		Explain the "StringBuffer" class in Java. How does it differ from the String class in terms of immutability and performance? What are the key methods provided by "StringBuffer" for manipulating strings? Explain with an example.	CO2	L2	10M
6		Discuss how class objects can be used as parameters in methods. What are the advantages of passing objects as parameters? Write a Java class "Rectangle" with methods to calculate the area and perimeter. Create another class "AreaCalculator" with a method that takes a "Rectangle" object as a parameter and calculates the	CO2	L3	10M

		area. Demonstrate the usage of this method in a main program.			
7		Explain the purpose of constructors in Java and the difference between a default constructor and a parameterized constructor. Write a Java class "Book" with both a default constructor and a parameterized constructor. Demonstrate how to create Book objects using both constructors and initialize their attributes.	CO2	L3	10M
8		Discuss the difference between passing arguments by value and passing arguments by reference in Java. Write a Java program with methods that demonstrate passing primitive types and object references. Show how modifications to parameters affect the original values.	CO2	L3	10M
9	(a)	Explain the role of the "this" keyword in Java. How does it help in accessing instance variables and methods? Write a java program to demonstrate "this" keyword.	CO2	L3	5M
	(b)	What is recursion? How does a recursive method work, and what are the key considerations when implementing recursive methods? Write a Java method to compute the Fibonacci sequence using recursion	CO2	L3	5M
10		Explain the "String" class in Java and its role in string manipulation. List and explain various methods of the "String" class for extracting characters, comparing strings, searching within strings, and modifying strings. Write a Java program that demonstrates the usage of these methods.	CO2	L3	10M

UNIT III
Short Answer Questions (2 Marks Each)

Q. NO.	QUESTIONS	CO	Bloom's Level	MARKS

1	Demonstrate about multidimensional arrays in java.	CO2	L2	2M
2	Compare and contrast abstract class and interface.	CO2	L2	2M
3	Describe an interface? How does it support multiple inheritance in java	CO2	L2	2M
4	Explain about the super keyword with examples.	CO2	L2	2M
5	Discuss whether java supports multiple inheritance? Justify your answer.	CO2	L2	2M
6	Explain how you print the number of elements in an array?	CO2	L3	2M
7	Explain the different methods of declaring and initialization of arrays	CO2	L2	2M
8	Explain about final keyword	CO2	L2	2M
9	Explain about Inheritance of interfaces.	CO2	L2	2M
10	Describe various sorting techniques.	CO2	L2	2M

Long Answer Questions (10 Marks Each)

Q. NO.		QUESTIONS	CO	Bloom's Level	Marks
1	(a)	Develop a program to perform matrix multiplication.	CO2	L3	5M
	(b)	Explain about the Object class in Java with its methods.	CO2	L2	5M
2	(a)	Develop a Java Program to implement Binary Search Mechanism	CO2	L3	5M
	(b)	Differentiate implements & extends keywords with	CO2	L3	5M

		suitable examples.			
3	(a)	Differentiate abstract classes & Interfaces.	CO2	L3	5M
	(b)	Illustrate The Use of Super keyword with suitable example.	CO2	L3	5M
4	(a)	Develop a Java Program to implement Bubble Sort	CO2	L3	5M
	(b)	Explain about Dynamic Method Dispatch with an example.	CO2	L3	5M
5	(a)	Explain about Arrays class and its methods	CO2	L3	5M
	(b)	Explain about different types of inheritance with examples	CO2	L2	5M
6		Develop a java program to check whether the given 2D array has non zero elements in the diagonal position and zeros in the non-diagonal positions .	CO2	L3	10M
7	(a)	What is method overriding? Illustrate the concepts of method overriding and constructor overriding.	CO2	L3	5M
	(b)	Develop a Java program to interchange the rows and columns of a given matrix.	CO2	L3	5M
8	(a)	Explain the member access mechanism in the inheritance with an example.	CO2	L3	5M
	(b)	How can you extend one interface by the other interface? Discuss	CO2	L3	5M
9	(a)	Develop a program to demonstrate the use of arrays as vectors.	CO2	L3	5M
	(b)	Explain the procedure to call super class members with an example.	CO2	L3	5M
10		Create an interface Shape with an abstract method draw(). Create two classes, circle and rectangle which implements interface Shape. Draw() should print the text indicating its shape. Create a reference to the shape and object of either circle or rectangle depending on the user ‘s choice and call the method draw().	CO2	L3	10M

UNIT IV
Short Answer Questions (2 Marks Each)

Q. NO.	QUESTIONS	CO	Bloom’s Level	Marks

1	List some of the checked exception classes in Java.	CO1	L2	2M
2	What is the use of CLASSPATH in Java?	CO1	L2	2M
3	What is an unchecked exception?	CO1	L2	2M
4	Differentiate throw and throws in exception handling.	CO1	L2	2M
5	How can you obtain the Class object for a specific class in Java?	CO1	L2	2M
6	Illustrate unboxing by converting an Integer object to an int.	CO1	L2	2M
7	Provide an example of autoboxing for converting an int to an Integer.	CO1	L2	2M
8	Write a program that calculates the square root of a given positive number using Math.sqrt().	CO3	L3	2M
9	For the primitive data types in Java (e.g., int, double, char) list their corresponding wrapper classes?	CO1	L2	2M
10	Illustrate the class hierarchy of the Throwable class.	CO1	L2	2M

Long Answer Questions (10 Marks Each)

Q. NO.		QUESTIONS	CO	Bloom's Level	Marks
1	(a)	Explain the behaviour of different access specifiers in packages.	CO3	L3	5M
	(b)	Develop a java program to handle multiple exceptions like Division by zero and Number Formatted Exception.	CO3	L3	5M

2	(a)	What is an exception? Explain exception handling mechanism with an example.	CO1	L2	5M
	(b)	Develop a Java program by defining, creating and accessing a package	CO3	L3	5M
3	(a)	What is the purpose of the java.lang package in Java? Which classes are automatically imported from this package?	CO1	L2	5M
	(b)	Explain the role of the Object class in Java. Why is it considered the root class for all other classes?	CO1	L2	5M
4	(a)	Develop a java program that demonstrates how certain exception types are not allowed to be thrown.	CO3	L3	5M
	(b)	Suppose you have a package named com.example.myapp. How would you import a class named MyClass from this package into another Java file?	CO3	L3	5M
5	(a)	Develop a java program that illustrates the application of multiple catch statements	CO3	L3	5M
	(b)	How can you write data to a file using FileOutputStream? Provide a code snippet demonstrating the process.	CO3	L3	5M
6	(a)	Demonstrate the class Throwable with the help of a Java program.	CO3	L3	5M
	(b)	Compare character streams (Reader and Writer) with byte streams (InputStream and OutputStream). When would you choose one over the other?	CO3	L3	5M
7	(a)	Give a brief description about the role of wrapper classes in java.	CO1	L2	5M
	(b)	Write a program that reads integers from the user using Scanner and calculates their sum.	CO3	L3	5M

8	(a)	Write a program to demonstrate the working of user defined exceptions.	CO3	L3	5M
	(b)	Describe the significance of the Math class. What mathematical operations can you perform using its static methods?	CO1	L2	5M
9	(a)	Discuss the importance of exception handling when working with files. What exceptions can occur during file I/O operations?	CO3	L3	5M
	(b)	Describe the role of standard I/O streams (System.in, System.out, and System.err) in Java. How can you read user input from the console?	CO1	L2	5M
10	(a)	Write a try-catch block that handles exceptions when opening a file for reading.	CO3	L3	5M
	(b)	What is the purpose of byte streams in Java I/O? Explain with an example of reading data from a file using FileInputStream.	CO1	L2	5M

UNIT V

Short Answer Questions (2 Marks Each)

Q. NO.	QUESTIONS	CO	Bloom's Level	MARKS
1	List the states in the lifecycle of a Thread?	CO4	L4	2M
2	What is context-switching in multi-threading?	CO4	L1	2M
3	Explain what is a thread.	CO4	L2	2M
4	Distinguish between a thread and a process?	CO4	L4	2M
5	List interfaces used in Java Collections Framework.	CO4	L2	2M
6	Summarize ArrayList in Java?	CO4	L2	2M
7	Develop a Java Program to create a List in Java?	CO4	L2	2M

8	Show the generic representation of Queue Interface	CO4	L1	2M
9	List out the operations on sets.	CO4	L4	2M
10	Construct a Java method to Find the element exists or not in a HashSet.	CO4	L3	2M

Long Answer Questions (10 Marks Each)

Q. NO.		QUESTIONS	CO	Bloom's Level	Marks
1	(a)	Analyze different ways of implementing a thread?	CO4	L4	5M
	(b)	Discover How threads communicate with each other?	CO4	L4	5M
2	(a)	Illustrate Priorities in Multithreading	CO4	L2	5M
	(b)	Examine the threads to prevent concurrency problem.	CO4	L4	5M
3	(a)	Distinguish sleep() and suspend() methods in multithreading with example code.	CO4	L4	5M
	(b)	Construct a Java program to create a multithreading using runnable interface	CO4	L3	5M
4	(a)	Explain the creation of a thread using extending a thread class.	CO4	L2	5M
	(b)	Compare a List with Set in Java	CO4	L4	5M
5	(a)	Conclude a priority queue in Java? How to declare it? Show with an example code.	CO4	L4	5M
	(b)	Explain the hierarchy of the Collection framework in Java.	CO4	L2	5M
6	(a)	Explain about HashSet.	CO4	L2	5M

	(b)	Classify in how many ways we can get the elements using index from a HashSet	CO4	L4	5M
7	(a)	Construct a program to iterate the list using the lambda expression.	CO4	L3	5M
	(b)	Develop a program in java to get the values present in a HashSet	CO4	L3	5M
8	(a)	Examine how to set and get elements to a list? Show with an example code.	CO4	L4	5M
	(b)	Examine how to insert and delete elements into an existing queue? Discuss.	CO4	L4	5M
9	(a)	Construct a Sample program to illustrate the sets.	CO4	L3	5M
	(b)	Develop a java program to ignore duplicate elements using hashset.	CO4	L3	5M
10	(a)	List the constructors of a Priority queue. Show with an example code.	CO4	L4	5M
	(b)	List the ArrayList methods of java. Explain any two with syntax and example	CO4	L4	5M

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