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Unit-1

CLASS 10

INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING CONCEPTS

A. Tick (✓) the correct option.

1. Which of the following describes abstraction?

   (a) Hiding implementation details ☐   (b) Reusing code ☐

   (c) Overloading functions ☐   (d) Sharing global data ☐

2. Which of the following programming paradigms does NOT support object-oriented programming?

   (a) Java ☐   (b) BASIC ☐

   (c) Python ☐   (d) C++ ☐

3. What is the primary focus of object-oriented programming?

   (a) Functions ☐   (b) Objects ☐

   (c) Global variables ☐   (d) Procedures ☐

B. Fill in the blanks.

1. .... programming is based on real-world objects.

2. The .... principle allows objects to take multiple forms.

3. .... programming does not use objects or classes.

C. Write 'T' for true and 'F' for false.

1. Encapsulation is used to restrict access to data within a class. ....

2. OOP makes it harder to debug programs. ....

3. C++ supports both procedural and object-oriented programming. ....

D. Short Answer Questions.

1. What are the key benefits of object-oriented programming?

2. How does inheritance help in code reusability?

3. Explain how abstraction helps in software development.

4. What is the difference between a class and an object?

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ELEMENTARY CONCEPT OF OBJECTS AND CLASSES

Unit-2

CLASS 10

A. Tick (✓) the correct option.

1. What does the "this" keyword refer to in Java?
   - (a) A static method ☐
   - (b) The current object instance ☐
   - (c) A parent class ☐
   - (d) None of these ☐

2. In Java, which of the following statements is correct?
   - (a) A class can have multiple constructors ☐
   - (b) An object can be created without a class ☐
   - (c) A constructor is called explicitly ☐
   - (d) None of the above ☐

3. What is true about an object?
   - (a) An object is a runtime entity ☐
   - (b) An object is an instance of a class ☐
   - (c) An object has a state and behavior ☐
   - (d) All of the above ☐

B. Fill in the blanks.

1. .... is the process of creating objects from a class.

2. A .... is a real-world entity that has state and behavior.

3. A constructor is automatically called when an .... is created.

C. Write 'T' for true and 'F' for false.

1. A constructor and a method are the same in Java. ....

2. An object can be created without a class. ....

3. The "this" keyword is used to refer to the current object. ....

D. Short Answer Questions.

1. What are the key features of an object?

2. How does a constructor differ from a method?

3. Explain the importance of the "this" keyword in Java.

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Unit-3

VALUES AND DATA TYPES

A. Tick (✓) the correct option.

1. Which of the following is the correct way to declare a constant variable in Java?
   - (a) const int MAX_VALUE 100;
   - (b) final int MAX_VALUE = 100;
   - (c) static int MAX_VALUE = 100;
   - (d) constant int MAX_VALUE = 100;

2. Which operator is used for logical OR in Java?
   - (a) &&
   - (b) ||
   - (c) !
   - (d) ==

3. What is the size of the short data type in Java?
   - (a) 1 byte
   - (b) 2 bytes
   - (c) 4 bytes
   - (d) 8 bytes

B. Fill in the blanks.

1. A variable that holds memory addresses is called a .... variable.

2. The ASCII standard represents text using .... bits per character.

3. The keyword used to create a class in Java is ....

C. Write 'T' for true and 'F' for false.

1. The boolean data type in Java allows storing numerical values. ....

2. Java allows implicit conversion from double to int automatically. ....

3. The String class in Java is a non-primitive data type. ....

D. Short Answer Questions.

1. Explain the concept of ASCII and Unicode in Java.

2. What are Java tokens? Name different types of tokens.

3. Differentiate between implicit and explicit type conversion with examples.

4. What is the purpose of escape sequences in Java?

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Unit-4

CLASS 10

OPERATORS IN JAVA

A. Tick (✓) the correct option.

1. Which of the following operators is NOT a relational operator?

   (a) >=   (b) <=

   (c) !=   (d) &

2. Which operator is used to compare two values for inequality?

   (a) ==   (b) !=

   (c) >   (d) <

3. What will be the output of the following expression?

   System.out.println(5 – 6 + 3 * 2);

   (a) 16   (b) 11

   (c) 10   (d) None of the above

B. Fill in the blanks.

1. The assignment operator in Java is represented by ....

2. The relational operator used to check if one value is greater than or equal to another is ....

3. The bitwise AND operator in Java is represented as ....

4. In the expression 5 + 3 * 2 – 3 % 8 , ... operator will execute first.

C. Write 'T' for true and 'F' for false.

1. The += operator is used to multiply two values and assign the result. ....

2. The != operator is used to check if two values are not equal. ....

3. Java's && operator returns true only if both conditions are true. ....

D. Short Answer Questions.

1. What is the difference between the == operator and the = operator?

2. Explain how the ternary operator works in Java with an example.

3. What is operator precedence? How does it affect the execution of expressions?

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Unit-5

CLASS 10

INPUT IN JAVA

A. Tick (✓) the correct option.

1. 1.Which of the following statements is TRUE about comments in Java?
    (a) Comments are compiled into the bytecode and affect performance.
    (b) Comments are ignored by the compiler and do not affect runtime behavior.
    (c) Comments are executed along with Java code.
    (d) Comments are required in every Java program.

2. Which of the following is a valid declaration of the main() method in Java?
    (a) public static void start(String[] args)
    (b) public static void begin(String args[])
    (c) public static void main(String[] args)
    (d) Assignment Operator

B. Fill in the blanks.

1. In Java, the try block is used to handle ...., while the catch block is used to handle ....

2. The three types of errors in Java are ...., ..., and ....

3. To read input from the keyboard, we use the .... class.

C. Write 'T' for true and 'F' for false.

1. The Scanner class can read input from both the console and files. ....

2. Comments in Java can change the behavior of the program at runtime. ....

3. System.out.println() is used to read input from the user. ....

D. Short Answer Questions.

1. What are the different types of comments in Java? Explain with examples.

2. What is an exception in Java? Give an example of a runtime exception.

3. Explain the difference between try and catch blocks in exception handling.

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Unit-6

CLASS 10

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INPUT IN JAVA

A. Tick (✓) the correct option.

1. Which of the following is the correct way to initialize an integer variable x with the value 10 in Java?
   - (a) int x = 10; ☐
   - (b) int x := 10; ☐
   - (c) let x = 10; ☐
   - (d) x = 10; ☐

2. What type of operator is != in Java?
   - (a) Arithmetic Operator ☐
   - (b) Logical Operator ☐
   - (c) Relational Operator ☐
   - (d) Assignment Operator ☐

3. Which of the following methods is used to input a float value using the Scanner class?
   - (a) next() ☐
   - (b) nextInt() ☐
   - (c) nextDouble() ☐
   - (d) nextFloat() ☐

B. Fill in the blanks.

1. The java.lang package contains fundamental classes such as ...., ..., and Math.

2. The Java method used to input a string value from the user is ....

3. A runtime error in Java is also known as a(n) ....

C. Write 'T' for true and 'F' for false.

1. The next() method of the Scanner class reads an entire line of input. ....

2. A syntax error occurs when a program tries to divide by zero. ....

3. The Scanner class belongs to the java.util package. ....

D. Short Answer Questions.

1. Write the syntax to input a short type value using the Scanner class.

2. Explain the difference between syntax errors and runtime errors.

3. What is the purpose of command-line arguments in Java?

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CLASS 10

CONDITIONAL CONSTRUCTS IN JAVA

Unit-7

A. Tick (✓) the correct option.

1. Which of the following will execute an if block?
   (a) x > y ☐   (b) x == y ☐
   (c) x < y ☐   (d) x >= y ☐

2. What is the result of the following expression?

   ```
   int a = 5, b = 10;
   String result = (a > b) ? "a is greater" : "b is greater";
   System.out.println(result);
   ```
   (a) a is greater ☐   (b) b is greater ☐
   (c) true ☐   (d) false ☐

B. Fill in the blanks.

1. The `&&` operator is known as the .... operator.

2. The ternary operator is a shorthand for .... statements.

3. A `switch` case executes until a .... statement is encountered.

4. The `if...else` statement can have multiple .... conditions.

C. Write 'T' for true and 'F' for false.

1. The `switch` statement cannot be used for String values.

2. The `break` statement is optional in a `switch` statement.

3. The ternary operator requires three operands.

4. The `if` statement can be used without an `else` block.

D. Short Answer Questions.

1. Write a Java program to check whether a number is divisible by 7.

2. Explain the use of the `switch` statement in menu-driven programs.

3. What is the purpose of the `default` case in a switch statement?

4. How does the `if...else` statement work in nested conditions?

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Unit-8

CLASS 10

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ITERATIVE CONSTRUCTS IN JAVA

A. Tick (✓) the correct option.

1. Which loop is best suited when the number of iterations is fixed?
   - (a) for loop ☐
   - (b) while loop ☐
   - (c) do-while loop ☐
   - (d) switch statement ☐

2. What is an Automorphic number?
   - (a) A number whose square ends in the same digits as the original number ☐
   - (b) A number divisible by the sum of its digits ☐
   - (c) A number whose sum of factorials of digits equals the number ☐
   - (d) A number that remains the same when reversed ☐

3. Which of the following is a Krishnamurthy number?
   - (a) 145 ☐
   - (b) 121 ☐
   - (c) 23 ☐
   - (d) 10 ☐

B. Fill in the blanks.

1. A number is Niven if it is divisible by the .... of its digits.
2. The perfect number is a number equal to the sum of its ....
3. The trimorphic number is a number whose .... contains the original number.
4. A spy number is a number where the sum of digits is equal to the .... of the digits.

C. Write 'T' for true and 'F' for false.

1. A Niven number is always even. ....
2. The factorial of Krishnamurthy numbers is equal to the number itself. ....
3. The do-while loop executes at least once. ....

D. Short Answer Questions.

1. Write a Java program to check if a number is an Automorphic number.
2. How does a Niven number work? Provide an example.
3. Write a menu-driven program to check if a number is Perfect or Trimorphic.

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Unit-9

CLASS 10

NESTED LOOP

A. Tick (✓) the correct option.

1. Which loop structure is required to generate the following pattern?

    A
    B C
    D E F
    G H I J

    (a) A single loop ☐   (b) A while loop ☐

    (c) A nested for loop ☐   (d) A switch case ☐

2. A Krishnamurthy Number is a number whose sum of the factorial of digits is equal to:

    (a) The sum of its digits ☐   (b) The square of the number ☐

    (c) The number itself ☐   (d) Twice the number ☐

B. Fill in the blanks.

1. A Trimorphic Number is a number whose cube ends in ....

2. The sum of all Armstrong numbers up to n is called the .... sum.

3. A Factorial Number is calculated using the .... function.

4. The outer loop in a nested loop runs for each complete execution of the .... loop.

C. Write 'T' for true and 'F' for false.

1. A Krishnamurthy Number is always odd.   ....

2. A Trimorphic Number is a number whose cube ends in its original value.   ....

3. A nested loop can have more than two levels of loops.   ....

4. A while loop always runs at least once.   ....

D. Short Answer Questions.

1. Write a Java program to check whether a number is a Krishnamurthy Number.

2. What is a Trimorphic Number? Give an example.

3. How does a nested loop work? Explain with an example.

4. Write a program to print the Floyd's Triangle pattern.

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CLASS 10

USER-DEFINED METHODS

Unit-10

A. Tick (✓) the correct option.

1. What is the purpose of String[] args in the main() method?
   (a) It is an array of String objects that stores command-line arguments
   (b) It is a single String value used as a variable
   (c) It stores integer inputs
   (d) It is a syntax error in Java

2. How do you correctly define a method that calculates the perimeter of a rectangle?
   (a) int perimeter(int length, int breadth) { return length + breadth; }
   (b) double perimeter(double length, double breadth) { return 2 * (length + breadth); }
   (c) void perimeter() { System.out.println("Perimeter"); }
   (d) None of these

B. Fill in the blanks.

1. The method `areaOfCircle(double radius)` calculates the .... of a circle.

2. A static method can be called without creating an .... of the class.

3. A method that does not return any value uses the .... keyword.

C. Write 'T' for true and 'F' for false.

1. A method must always have parameters. ....

2. The main method in Java is a user-defined method. ....

3. Methods help in reducing redundancy in a program. ....

D. Short Answer Questions.

1. What is the purpose of return statements in methods?

2. How does Java handle method calls with arguments?

3. Write a program using recursion to find the factorial of a number.

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CLASS AS THE BASIS OF ALL COMPUTATION

A. Tick (✓) the correct option.

1. Which of the following statements about method overloading is TRUE?
   (a) Methods must have the same return type
   (b) Methods must have the same name but different parameter lists
   (c) Methods must have the same number of parameters
   (d) Methods must have different access modifiers

2.. What is the primary purpose of method overloading?
   (a) To write multiple methods with different names
   (b) To increase memory usage
   (c) To allow multiple methods with the same name but different parameters
   (d) To prevent the use of constructors

B. Fill in the blanks.

1. A constructor is a special method used to .... an object.
2. Method overloading allows multiple methods in the same class with the same name but different ....
3. A parameterized constructor accepts ....
4. The default constructor does not accept ....

C. Write 'T' for true and 'F' for false.

1. A constructor can return a value.
2. Method overloading allows different methods to have the same name but different parameter lists. ....
3. Java automatically provides a default constructor if none is defined. ....

D. Short Answer Questions.

1. What is method overloading? Give an example.
2. Explain the difference between a default constructor and a parameterized constructor.
3. What happens when a constructor is not defined in a class?

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CLASS 10

CONSTRUCTORS

Unit-12

A. Tick (✓) the correct option.

1. What is the primary purpose of a default constructor?
   - (a) To initialize instance variables with default values
   - (b) To allow constructor overloading
   - (c) To make the class abstract
   - (d) To perform complex initialization logic

2. What is the correct way to declare an object of a class named `Employee`?
   - (a) Employee e = Employee();
   - (b) Employee e = new Employee();
   - (c) Employee e = object Employee();
   - (d) new Employee e();

B. Fill in the blanks.

1. The main purpose of a constructor is to .... an object.
2. A constructor must have the same .... as the class name.
3. A constructor is called automatically when an .... is created.
4. Constructor overloading allows multiple constructors with different .... lists.

C. Write 'T' for true and 'F' for false.

1. A constructor can have a void return type. ....
2. A default constructor does not accept any parameters. ....
3. A parameterized constructor allows initialization of objects with specific values. ....

D. Short Answer Questions.

1. What is the difference between a default constructor and a parameterized constructor?
2. Write a Java program that includes a constructor to initialize employee details.
3. What happens when multiple constructors are defined in a class?

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LIBRARY CLASSES

Unit-13

CLASS 10

A. Tick (✓) the correct option.

1. What will be the output of Character.isLowerCase('a')?
   - (a) true ☐
   - (b) false ☐
   - (c) null ☐
   - (d) 0 ☐

2. Which method is used to convert an int to a String?
   - (a) Integer.toString(int) ☐
   - (b) Integer.parseInt(int) ☐
   - (c) Integer.valueOf(int) ☐
   - (d) Integer.toCharArray() ☐

3. Which method is used to convert a String to a double?
   - (a) Double.parseDouble(String) ☐
   - (b) Double.valueOf(String) ☐
   - (c) Double.toString(String) ☐
   - (d) Both a & b ☐

4. What does the Character.isLetterOrDigit('5') method return?
   - (a) true ☐
   - (b) false ☐
   - (c) null ☐
   - (d) None of the above ☐

B. Fill in the blanks.

1. The Character.toUpperCase('c') method returns ………………....

2. Integer.parseInt("250") returns a value of type …………………..

3. To check if a character is a letter, we use Character. …………………..(char).

4. Double.toString(4.5) converts a double into a …………………..

C. Write 'T' for true and 'F' for false.

1. Character.isUpperCase('Z') returns true. ……………

2. Integer.parseInt("300") returns a String. ……………

3. Double.valueOf("7.2") returns a double. ……………

D. Short Answer Questions.

1. What is the purpose of Character.isLetter(char ch)?

2. Explain the concept of autoboxing with an example.

3. How does Double.toString(double) work?

4. What is the difference between isDigit() and isLetter() methods?

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LIBRARY CLASSES

Unit-14

A. Tick (✓) the correct option.

1. What will be the output of Character.isLowerCase('a')?
   - (a) true
   - (b) false
   - (c) null
   - (d) 0

2. Which method is used to convert an int to a String?
   - (a) Integer.toString(int)
   - (b) Integer.parseInt(int)
   - (c) Integer.valueOf(int)
   - (d) Integer.toCharArray()

3. Which method is used to convert a String to a double?
   - (a) Double.parseDouble(String)
   - (b) Double.valueOf(String)
   - (c) Double.toString(String)
   - (d) Both a & b

4. What does the Character.isLetterOrDigit('5') method return?
   - (a) true
   - (b) false
   - (c) null
   - (d) None of the above

B. Fill in the blanks.

1. The Character.toUpperCase('c') method returns ………………..
2. Integer.parseInt("250") returns a value of type ………………..
3. To check if a character is a letter, we use Character.………………(char).
4. Double.toString(4.5) converts a double into a ………………..

C. Write 'T' for true and 'F' for false.

1. Character.isUpperCase('Z') returns true. ………………
2. Integer.parseInt("300") returns a String. ………………
3. Double.valueOf("7.2") returns a double. ………………

D. Short Answer Questions.

1. What is the purpose of Character.isLetter(char ch)?
2. Explain the concept of autoboxing with an example.
3. What is the difference between isDigit() and isLetter() methods?

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ARRAYS

Unit-15

CLASS 10

A. Tick (✓) the correct option.

1. Which of the following sorting algorithms is commonly used for sorting an array in Java?

   (a) Bubble Sort   (b) Selection Sort

   (c) Quick Sort   (d) All of these

2. What happens when a negative index is used in an array?

   (a) It throws an ArrayIndexOutOfBoundsException

   (b) It returns null

   (c) It accesses the last element of the array

   (d) It returns -1

3. How do you initialize an array with predefined values?

   (a) int arr = new int(5);   (b) int arr[] = {1, 2, 3, 4, 5};

   (c) int arr = (1, 2, 3, 4, 5);   (d) int arr[5] = {1, 2, 3, 4, 5};

B. Fill in the blanks.

1. The default value of a String array element is ....

2. The last index of an N element array is ....

3. .... search is used to search an element in a sorted array efficiently.

C. Write 'T' for true and 'F' for false.

1. The default value of a double array element in Java is 0.0.   ....

2. Java allows multidimensional arrays of different sizes.   ....

3. Java allows direct resizing of arrays without creating a new array.   ....

D. Short Answer Questions.

1. Explain the concept of a binary search in arrays.

2. How can you reverse an array in Java?

3. What are the differences between an array and an ArrayList in Java?

4. How does selection sort work in sorting an array?

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ARRAYS

A. Tick (✓) the correct option.

1. Which method is used to find the length of a string?

   (a) length()   (b) size()

   (c) count()   (d) getSize()

2. How do you create a new string object in Java?

   (a) String s = new String("Hello");   (b) String s = "Hello";

   (c) Both a and b   (d) None of these

3. What will be the output of the following code?

```
String s = "Hello World";
System.out.println(s.substring(1,7));
```

   (a) ello Wo   (b) ello W

   (c) Hello W   (d) Compilation error

B. Fill in the blanks.

1. The method used to convert a string to uppercase is ………………..

2. The ……………… method returns a substring of a string.

3. The equalsIgnoreCase() method compares two strings while ignoring ………………..

4. The ……………… method returns the last occurrence of a specified character in a string.

C. Write 'T' for true and 'F' for false.

1. The substring() method can extract a portion of a string.   ………….

2. The equals() method ignores case while comparing two strings.   ………….

3. The replace() method replaces all occurrences of a character in a string. ………….

D. Short Answer Questions.

1. Write a Java program to extract a substring from a given string.

2. Write a Java program to check if a given string is a palindrome.

3. Describe the use of the indexOf() and lastIndexOf() methods in Java.

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