MID-SEMESTER EXAMINATION, May-2023
DATA STRUCTURE AND ALGORITHMS (CSE 2001)

Programme: B.Tech/BCA/MCA/MSc/M.Tech **Semester:2nd**
Full Marks: 30 **Time: 2 Hours**

Subject/Course Learning Outcome	*Taxonomy Level	Ques. Nos.	Marks
Able to state and explain the basic programming syntax, semantics, building blocks.	L1	4(a,c) 5(b)	6
Able to develop java programs using the programming constructs like conditional statements, looping, arrays, methods and structures.	L2	2(a,b,c) 3(a,b,c) 4(b) 5(a)	16
Able to analyze, debug and test the programs and correctly predict their outputs.	L3	1(a,b,c) ,5(c)	8

*Bloom's taxonomy levels: Remembering (L1), Understanding (L2), Application (L3), Analysis (L4), Evaluation (L5), Creation (L6)

Answer all questions. Each question carries equal mark.

1. (a) Find output of the given code snippet. 2

```
class p2
{
        static int x=-55;
        public static void main(String args[])
        {
          p2 obj1=new p2();
          obj1.x=obj1.x*2-66;
          System.out.println(obj1.x);
          p2 obj2=new p2();
          obj2.x=obj2.x+66;
          System.out.println(obj1.x+" "+obj2.x);
        }
        static
        {
              System.out.println(x);
        }
}
```

(b) Find Error or output of the below given code. If error then re-write the correct code. 2

```
public class p2
{
        public static final int x=4;
        public static void main(String[] args)
        {
         int a=10,b=5;
         switch(a<b?a:b-1)
         {
          case 5:
               System.out.println("Wow");
               break;
          case 3:
               System.out.println("Its working");
               break;
          case x:
               System.out.println("Ooh...");
               break;
          default:
               System.out.println("Fine...");
        }
   }
}
```

(c) Find Error or output of the below given code. If error then re-write the correct code. 2

```
abstract class Bank
{
    private String bankName;
    Bank(String bankName)
    {
        this.bankName=bankName;
    }
    public String getBankName()
    {
      return "Your bank is:"+bankName;
    }
}
class p2 extends Bank
{
        p2()
        {
          super("SBI");
          super("AXIS");
```

```
    }
    public static void main(String args[])
    {
      Bank bank=new p2();

System.out.println(bank.getBankName());
    }
}
```

2. (a) Define a class called Complex with instance variables real, imag and instance methods display() and add(). Initialize the two complex number by using parameterized constructor. Write a Java program to add two complex number. The prototype of add method is: *public Complex add(Complex, Complex).* 2

(b) Write a Java program to declare a Class named as Person which contains name and age as instance members and Person (name,age) and displayStudent () as constructor and instance methods. A derived class Employee is created from the class Person. The derived class contains eid, dept, salary as instance members. Use proper constructor to initialize Employee details. The displayDetails () is to print the employee details. 2

(c) For the Question no. 3(a) Create an array of objects of the Employee class and display the details of 50 employees. 2

3. (a) Define an interface StaffInterface (void displayStaff(), void giveBonus(double amount)). Define an abstact class Staff (Fname, Lname, salary). 2

(b) Use Question no. 4(a) and define a concrete class Supervisor(bonous) subclass of staff and define the interface methods. Use proper constructor in the class hierarchy. Ensure bonous amount should not be zero, handle it using exception handling. Create an array of interface references and populate the supervisor objects. 2

(c) Initialize an array with name of the Animals. Identify the 2 exceptions that may be generated and write the exception handler in Java. 2

4. (a) Why multiple inheritance is not supported in java. Explain with proper examples. 2

(b) Write a java program to print an array of different type using single Generic method. The signature of printArray method is given below.
public static <T> void printArray(T a[])

(c) What is auto boxing and unboxing explain with proper examples. 2

5. (a) Write a java program to read dsa_mark from keyboard. If the dsa_mark>100 then throw an user defined Exception "MarkException" with a customized message "Mark can't be greater than 0". 2

(b) What is the use of finally block in Exception Handling. Explain with proper examples. 2

(c) For the below given code snippet which line having error. Identify the error. Correct the error and re-write the code. 2

```
abstract class Bank
{
        private abstract void withdraw();//Line
1
        abstract void deposit();
        public void balance();//Line 2
}
class office extends Bank
{
        void deposit()//Line 4
        {

        }
}
```

End of Questions