INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, SRI CITY

TERM-III EXAMINATION – MONSOON 2024

Object Oriented Programming

CSE:UG2 /PC

Duration: 90 Mins (02:45-04:15 PM)

Date: 21-11-2024

Max. Marks: 20

Instructions: Roll No: S20230010255

1. All questions are compulsory.
2. Write the answers neatly and clearly without any overwriting or corrections on the answer sheet; otherwise, an appropriate penalty will be imposed.
3. Attach the question paper with the answer sheet

Answer all the questions

PART-A

1.	Fill in the blanks. a. System.in is an object of type_____ ; System.out and System.err are objects of type _____ . b. _____ interface should be implemented by a class to run a thread in Java. c. _____ method of _____class is used to establish a connection with the database from a Java application.	[3 Marks]

2	What will be the output/possible error of the following code snippets (consider all the required packages have been imported).
	a. public class Main extends Thread {
	public void run(){
	  System.out.println(Thread.currentThread().getPriority());
	
	}
	public static void main(String args[]) {
	Thread t = Thread.currentThread();
	System.out.println(t.getPriority());
	Main t1=new Main();
	Main t2=new Main();
	t1.setPriority(Thread.MAX_PRIORITY);
	t1.start();
	t2.setPriority(Thread.MIN_PRIORITY);
	t2.start();
	
	}
	
	}
		[1 Mark]

		[1 Mark]

	b. ```java
	public class Test {
	    public static void main(String[] args) {
	    Deque<String> deque=new ArrayDeque<String>();
	    deque.offer("Hi");
	    deque.add("Java");
	    deque.offerFirst("Hello,");
	    deque.offer("Programming");
	    System.out.println("The queue is ...");
	    for(String s:deque){ System.out.println(s); }
	    deque.poll(); deque.pollLast();
	    System.out.println("The queue after poll...");
	    for(String s:deque){
	        System.out.println(s);
	    } }
	}```	

	c. ```java
	class demoFile
	{
	    public static void main(String args[]) {
	        File f = new File("C:/java/xyz");
	        System.out.print(f.getName());
	        System.out.print(f.getParent());
	        System.out.print(" " + f.isFile());
	    }}```
		[1 Mark]

3.	Which of the following classes is used for reading characters from a file in Java? A) FileInputStream B) BufferedReader C) FileWriter D) ObjectInputStream	[1 Mark]
4.	Which of the following statements correctly distinguishes between Iterator, Iterable, Collection, and Collections in Java? A) Iterable is an interface that provides a way to iterate over elements, and Iterator is a class that implements the Iterable interface to allow iteration over collections. B) Iterator is an interface that provides methods to iterate over a collection, and Iterable is a class that must be implemented by all collection classes. C) Collection is an interface that represents a group of elements, and Collections is a utility class that provides static methods for working with collections. D) Collection is a class that holds a group of elements, and Collections is an interface that provides a common set of methods for working with collections.	[1 Mark]

PART-B

5.	Design and implement a Student Management System in Java with the following features: Create a Student class with attributes studentId, name, major, and gpa, ensuring the gpa is validated to be between 0.0 and 4.0, throwing a custom GPAValidationException for invalid values. Implement a method to read student records from a CSV file, validate each record and skip invalid entries. Store valid records in a relational database table students using JDBC, ensuring no duplicate entries based on studentId. Use multithreading to insert records into the database concurrently while maintaining thread safety. NB: No need of implementing the driver class	[4 marks]
6.	a. Are user-defined exceptions in Java categorized as checked or unchecked exceptions? Create a custom *InvalidAgeException* for a voting system that throws this exception when the age is less than 18. b. With an example context, show the use of bounded types in Java generics.	[2+2 marks]
7.	a. Discuss the steps and methods required to achieve java database connectivity through JDBC API. b. Explain what is collection, and discuss all the interfaces and classes in the Collection framework hierarchy with a diagram.	[2+2 Marks]