Name: **Enrolment No:**	

UPES

End Semester Examination, December 2024.

Course: JAVA Programming
Semester: I
Program: Master of Computer Application (MCA) **Time : 03 hrs.**
Course Code: CSEG7031_4 **Max. Marks: 100**

Instructions: Not Applicable.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Write two differences between the 'while' and the 'for' loops in Java. Support your statements with proper code snippets.	**4**	**CO1**
Q 2	Show the inner workings and the outputs for any TWO of the following Java code snippets: (a) 65 ^ 79 [logical bitwise OR operator] (b) -57 >>> 4 [Unsigned Right Shift Operator] (c) ++x + y-- + z++ + x++ + --y + z (where x = 6, y = 9, z = 4)	**2+2=4**	**CO1**
Q 3	Write one similarity and one difference between the static nested class and the anonymous inner classes. Support your points with proper code snippets.	**2+2=4**	**CO2**
Q 4	Write two differences between the type parameters and the wild cards in Java. Support your points with proper code snippets.	**4**	**CO3**
Q 5	Write two advantages of an ArrayList over a vector. Write two advantages of a vector over an ArrayList.	**2+2=4**	**CO4**
	SECTION B **(4Qx10M= 40 Marks)**		
Q 6	(a) Discuss in brief how interface resolves the Diamond Problem in Java. (b) Give one similarity and one dissimilarity between an abstract class and an interface in Java. (Give supporting code snippets). (c) Write a simple Java code (with comments) that shows the scope limitations of different access specifiers with respect to same and different packages (different scenarios: same class, other class – child or non-child).	**2+4+4=10**	**CO2**

Q 7	(a) Write one advantage of Character streams over Byte streams and write one advantage of Byte streams over Character streams. (b) Give two differences between random access files and regular file I/O streams. (c) Write a Java code to perform the following: - Create a file with name "input.txt" in your system - Retrieve the file information (path, readable or not, writable or not, and the size of the file) - Write onto the file a single line on "UPES Examination system" (Consider the case that the file may not be writable also) - Read the file and write the content of the file onto another file, which is already existing in your system, say "output.txt".	**2+2+6=10**	**CO3**
Q 8	(a) Write a Java code to show why thread scheduling is necessary in a multi-threaded program (Explain). (b) Explain any one thread-scheduling technique in Java with supporting code snippet. (c) What is the deadlock in Java? Explain why the producer-consumer scenario faces a deadlock scenario. Explain how we can overcome the problem. (Code is not required)	**3+2+5=10**	**CO3**

Q 9	Debug and handle possible exceptions in the following Java code. Add explanatory comments:
	`import java.util.ArrayList;`
	`class LinkedList{`
	`  public static void main(String[] args){`
	`  ArrayList<> nums = new List<double>();`
	`  Scanner sc = new Scanner(system);`
	`  for(i=0; i>nums.size(); --i)`
	`  item = sc.nextdouble();`
	`  nums.Add(item);`
	`  int k = sc.nextLine();`
	`  System.out.printf("Element: "+ nums.Get(k));`
	`  int x = sc.nextint();`
	`  System.out.println("Updated nums: "+nums.change(x));`
	`  ltrs.clear(sc.nextint());`
	`  System.out.println("Updated nums: "+nums.current());`
	`  }`
	`}`
		5+3+2=10	**CO2+ CO4**

	OR (a) Discuss two similarities and two differences between the Set interface and the Map interface in Java. (b) Write appropriate code snippets to show how the following operations are done in Java: - List traversal using Iterator object - Set traversal using a lambda expression - ArrayList object creation that can hold data of different types simultaneously (c) Explain one similarity and one dissimilarity between a set and a sorted set in Java. Give supporting code snippets.	**4+3+3=10**	
SECTION-C (2Qx20M=40 Marks)			
Q 10	(a) Describe the searching and comparison techniques in Java while dealing with String class objects. Give necessary code snippets. (b) Write a single Java code to show how the following exceptions occur in programs. - ArrayIndexOfBoundsException - NullPointerException - NumberFormatException	**(6+8)+6 = 20**	**CO3**
Q 11	(a) Explain the thread life cycle in Java through a diagram/chart accompanied by a brief description of the different states. (b) Explain through a simple Java code why synchronization is necessary in a multi-threaded program. (c) Explain three different thread-scheduling techniques in Java. Show modifications to the snippets of the above code for each of the techniques. OR Justify or oppose the following statements. Give supporting code snippets (if necessary). (a) Local inner classes cannot access all the variables of the enclosing class/block it is defined in always. (b) File handling with buffered I/O streams is not efficient compared to normal File I/O streams (c) Daemon threads in a program start before the other user-defined threads in the program but die just before the main thread dies. (d) Generics can be used with a class/interface having static fields/methods. (e) We cannot always replace an anonymous inner class in a program with a proper lambda expression.	**7+4+9=20** **5×4=20**	**CO4**