Intake 48

1. a) What is the difference between "Checked" and "Unchecked" exceptions? What will be the output of the following code? Give proper reasoning.

```
public class ExceptionExample (
public static void main(String[] args) {
outer TryO;
} catch (Exception e) {
System.out.println("Exception caught in the main method: " + e);
public static void outer Try {
try {
inner Try;
¿ catch (ArithmeticException e) {
System.out.println("Exception in the outerTry method: " + e);
public static void inner TryO
try f
int result = 10 / 0;
System.out.println("Result: " + result);
} catch (NullPointer Exception e) {
System.out.println("Exception in the innerTry method: " + e);
```

b) What will be the outputs of the following code-

```
public static void main(String (] args) {
        String s1 = "Java";
        String s2 = new String ("Java");
        System.out.println(sl.lengthQ);
        System.out.println(sl+9+9);
        System.out.println(sl.charAt(3));
        System.out.println(s|=s2);
        System.out.println(sl.compareTo(s2));
        }
```

2. (a) Write a function that takes a string as input and returns the string in the reversed form. (You cannot use the reverse) method of StringBuilder.)
   For example:
   Input: "hello"
   Output: "olleh"

   (b) How do threads communicate with each other? Just write the names of 3 methods. What are the different ways to create a Thread? Show such ways by java example.

3. (a) Write the output of the given code -

```
public static void main(String (] args) {
        List<String> colors = new ArrayList<>();
         colors.add("Red");
        colors.add("Green");
         colors.add("Blue");
         colors.add("Blue");
        colors.add("Yellow");

        System.out.println(colors.set(4, "Orange"));
        System.out.println(colors.indexOf("Purple"));
        colors.remove "Blue");
        System.out.println(colors.get(2));
        System.out.println(colors.contains("Blue"));
        System.out.println(colors.subList(1,3));
        }
```

(b) Complete the method 'countUniqueElements' that returns the count of unique elements of the array.

```
public static void main(String) args› {~/
        int [] nums = {1, 2,3,4,2,5,6,1,7,8,9,5};
        int uniqueCount = countUniqueElements(nums);
        System.out.println(uniqueCount);
        }
```

4. (a) Write a Java program that takes a string as input and prints the count of each character in the string using a HashMap.
For example:
Input: "Java"
Output: {a - 2, v - 1,J - 1}

(b) Write a Java program that copies the contents of one text file to another. Use BufferedReader and Bufferedwriter.

Intake 49

1. (a) In how many ways thread classes can be created? Explain with examples.

   (b) There is an input file named "input.txt". Read all the strings from that file. Now calculate the length of all strings and write them to "output.txt" file.

Input.txt	Output.txt
Mango Apple	5 5

2. (a) Imagine you have a bank account. You can deposit and withdraw money from your account. You should keep in mind that the total amount of money withdrawn from your account must not exceed the total balance present in your account. If such a scenario happens, you need to safely execute from the banking system. Implement the above case in Java with the proper utilization of user-defined exception mechanisms.

   (b) Create a class named Vehicle which has the property named price(double), vehicle-type(string), speed(double) etc. The value of price, vehicle-type and speed will be initialized when we create an object of that class. Make 5 objects of Vehicle class and add them into an ArrayList. Those vehicles whose price is over 150000 taka will be shown in output. Complete the Program.

3. (a) Create a class named Book. Write a program to insert 5 Book objects in a Stack list.
   Now take user input for a variable named "option". If option is 1 then insert another Book object. If option is 2, delete the top Book object from the stack list. If option is 3, just output the top Book object. Use proper stack list methods.

   (b) There are two strings given:
   S1 = "Happy New Year"
   S2 = "Change is the only constant in life"
   Now extract "New" from SI and "life" from S2. Add these two words to make a sentence. Capitalize this sentence and find the last occurrence of "E' from the sentence. Perform all of these tasks using proper String class functions.

4. (a) Write a program to create three threads. Inside the first thread print your names 15 times but wait for l second before printing each time. Inside the second thread print your student ID 10 times. Inside the third thread print your CGPA 10 times. Make sure the second thread gets more OS access than the first thread and the third thread starts after finishing the second thread.

   (b) Suppose two threads are calling the increment and decrement methods-concurrently on the same Counter object. Discuss the possible problem that can occur in this situation. How to avoid this kind of problem? Analyze the situation by implementing the above mentioned code.

Intake 50

1. a) Design a flight booking system that validates passengers' age, seat availability, and payment status while fetching flight details from a server. Passengers must be between 18 and 80 years old; otherwise, throw custom exceptions Too YoungException or TooOld Exception, as there are no built-in exceptions for such validations. If no seats are available, throw a NoSeatsAvailableException, ensuring the check is logged using a finally block. Write methods to handle the scenarios, and demonstrate their use in a program, ensuring all exceptions are caught, logged, and properly managed using try, catch, throw, and finally.

   b) Consider a scenario where you might want to catch an Exception inside a try block. Now generate a code for the nested try-catch.

2. a) You are writing a paragraph and you want to know how many words you have written. Now write one function where it counts the number of words from a given String. You cannot use any built-in function.

   b) A data annotator is inputting everyones name through a software. But for some reason, he is facing some issues. An unwanted character is getting inside the name. For example, when he is inputting "Chandra Mukhi", the software is showing the as "Chan---dra M-u--kh-i". The unwanted character is *". Now generate a function where it will take a String as input, remove these unwanted characters and return the noiseless String.

3. a) An employee could save any of his two values. For example, he can save his name or id. Or he could save his height and job description. Now generate a class called Employee that can save any two types of values.

   b) You have a list that consists of integers. You have to remove all the repeating integers from the List. Example:
   Input - [1, 2, 2, 3, 3, 3, 4, 4]
   Output - [1, 2, 3, 4]

4. a) Given a List of integers, generate the maximum and the minimum integers of that list,

   b) Suppose there are two tables. One table saves the name and the student _id. The other table saves the student _id and grade. Now generate a function where it takes name as an input and you have to determine the grade of that student. Solve this problem using map.