Course: JAVA (2) **Semester**: 1st term 2026/2027.	**Lecturer**: Dr. Mohammed AbdelFattah **Assistants**: Engs. / Osama El-Samadony, Mostafa El-Mansy, Mohammed Osama, Mohammed Saeed, Hazem Hamdy, Mena-Allah, Mariem Fathy, Youssef Mohammed, Mohammed Adel, AbdelRahman Ibrahim

Tutorial: *Sheet 4*

Part A – True or False:

1. A `HashSet` allows duplicate elements. (___)
2. The elements in a `HashSet` are stored in a specific order. (___)
3. A `HashMap` stores data in key-value pairs. (___)
4. In a `HashMap`, keys must be unique. (___)
5. The `Iterator` interface allows you to loop through a collection safely. (___)
6. You can use a `for-each` loop to iterate through a `HashSet`. (___)
7. A `try` block in Java must always be followed by a `catch` block. (___)
8. The `IOException` is a checked exception in Java. (___)
9. You can read a text file in Java using classes like `FileReader` or `BufferedReader`. (___)
10. The `finally` block executes only if no exception occurs. (___)

Part B – Multiple Choice Questions

1. Which of the following allows only unique elements?
   a) `ArrayList` b) `HashMap` c) `HashSet` d) `LinkedList`
2. What does a `HashMap` store?
   a) Only keys b) Only values c) Key-value pairs d) None of the above
3. Which method is used to add an element to a `HashSet`?
   a) `insert()` b) `add()` c) `put()` d) `push()`
4. In a `HashMap`, if you add another value with an existing key:
   a) It throws an error b) It adds a duplicate key
   c) It replaces the old value d) It ignores the new value
5. What method is used to get a value from a `HashMap` using its key?
   a) `find()` b) `get()` c) `search()` d) `lookUp()`
6. Which method of the `Iterator` interface checks if more elements are available?
   a) `hasNext()` b) `next()` c) `previous()` d) `checkNext()`
7. Which of the following exceptions must be handled using try-catch or declared using `throws`?
   a) `IOException` b) `ArithmeticException`
   c) `NullPointerException` d) `ArrayIndexOutOfBoundsException`
8. Which class is used to write text into a file?
   a) `FileReader` b) `FileWriter` c) `FileInputStream` d) `FileScanner`
9. What happens if an exception occurs inside a `try` block without a matching `catch`?
   a) The program crashes immediately b) The exception is ignored
   c) The program will compile but stop at runtime d) The exception is thrown to the calling method
10. Which loop type is best for iterating through a `HashSet`?
    a) `for` loop with index b) `while` loop only
    c) `for-each` loop or `Iterator` d) None of the above

Part C: Programming Tasks

1. **HashSet Example:**

   Create a `HashSet` of strings, add 5 elements, and print them using a for-each loop.

2. **HashMap Example:**

   Create a `HashMap` that stores student names and grades, then print each key-value pair.

3. **Iterator Example:**

   Create a `HashSet` of integers and use an `Iterator` to display all elements.

4. **Exception Handling:**

   Write a program that divides two numbers entered by the user and handles `ArithmeticException` if the denominator is zero.

5. **Working with Files:**

   Write a Java program that creates a text file and writes "Welcome to Java!" into it using `FileWriter`.