The City College of New York

Department of Compute Science – CSc 221: Software Design Laboratory – 3rd Exam

Name:_____ ID:_____

Q1) (6p) Java offers different methods to write data to persistent storage (e.g. Har Disk Drive). One of these methods is *XML* serialization. Briefly describe each of the following.

JAXB

Marshalling

Unmarshal

Q2) (6p) Java streams offer, *lazy* and *eager* operations. Briefly describe each type's return and behavior.

Lazy Operations:

Eager Operations:

Q3) (6p) An example of a generic method is $public\ static\ <T>\ void\ printArr(T[\ ]\ inputArr)$**. (1) What are two advantages of using generic methods instead of overloaded ones? (2) Why is the type of** $inputArr$ **set to** T**. (3) What happens to** T **once the program compiles?**

Form A

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Q4) (13p) Consider the following code block and answer the questions that follow.

```
int values[ ] = {1, -5, -3, 3, 0, 7, 9, 11};
IntStream intRange = IntStream.of(values);
intRange.forEach(num -> System.out.println(num));
```

A. (6p) Rewrite the above code using traditional Java looping structures. Both outputs must be identical.

```
int values[ ] = { 1, -5, -3, 3, 0, 7, 9, 11 };
```

B. (3p) Show the last three printed lines from the code above?

C. (4p) Using the *intRange* variable only, print the *maximum* of the values?

Q5) (19p) Consider a plain text file consisting of multiple lines. Each line contains exactly one word. *Using the Java streams library ONLY* complete the main method such that:

1. **Using the *Files* class, read the content of the file**
2. **Exclude words that have less than 3 characters – Don't use an IF statement**
3. **Convert each word to upper case and add the values to the *stack*.**
4. **Finally print the values of the *stack*.**

```
public class FileTester {
    public static void main(String[] args) throws IOException {

        Path path = Paths.get("Words.txt");

        Stack<String> stack = _____
```