



ICS4U

Arrays (Notes Review)

Answer the following questions on a separate sheet of paper, hand written only. Complete sentences not required. (1pt each unless otherwise stated)

1. What is an array?
2. Given:

```
float [] x;
```

What precisely have you created?
3. Given:

```
x = new float [10];
```

What precisely have you created?
4. What is the index of the first element in an array?
5. What is the index of the last element in an array of size k?
6. Define: physical size and logical size of an array.
7. What is garbage collection?
8. When is an object considered garbage?
9. What is a memory leak?
10. All objects are subclasses of what?
11. If you had a class with only primitive data type fields (eg. int, double, etc.) would you need to write a clone method?
12. Suppose a and b are 2 float arrays. What is the difference between saying:

```
a = b;
```

and

```
a = (float []) b.clone();
```
13. What is a deep copy?
14. All clone methods will have 3 parts. What are these 3 parts?
15. How does a StringBuffer differ from a String?
16. List 4 useful StringBuffer methods.
17. What's a token? delimiter?
18. A StringTokenizer is really only good for one thing. What?
19. Give the code necessary to create an array of 10 Fractions and give each Fraction a value of zero. Assume that a Fraction is a previously declared class and that a constructor with no parameters will initialize it to zero. (5 pts)
20. What is printed if the following code is executed: (2 pts)

```
String s = "hello";
String b = "there";
s = b;
b = "fred";
c.print(s);
```
21. What happened to the String "hello", in the above question?
22. If s was a String, what does `s.replace('e', 'i')` do to s?
23. If s was a StringBuffer, what does `s.append (".")` do to s?

24. If `s = "A test of string methods."`
What are the following? (1 pt each)
- `s.length()`
 - `s.substring(11)`
 - `s.substring(2,5)`
 - `s.charAt(5)`
 - `s.startsWith("test",4)`
 - `s.indexOf("s")`
 - `s.indexOf("st",7)`
25. Write the code necessary to create and fill the following 2D integer array. This is NOT square. (5 pts) You can't use the `= {5 5 5 5...}` etc idea, but must use loops and so on.
- ```
5 5 5 5 5
4 4 4 4
3 3 3
2 2
1
```
26. Draw a picture of what is created in the following code: (4pts)
- ```
SomeObject[] [] r;
r = new SomeObject [2] [3];
for (int i = 0 ; i < 2 ; i++)
    for (int j = 0 ; j < 3 ; j++)
        r [i] [j] = new SomeObject ();
```
27. For the following code, use a numbered list for all the objects that are created and changed and all the garbage created during the running of the program and after it finishes, as in the Notes "Garbage Collection" example. (20pts)
- ```
public static void main (String[] args)
{
 String s, t;
 double[] x = {1.2, 2.5};
 s = "Hello";
 t = s + " there.";
 s = t.substring (0, t.length () - 1) + " Joe.";
 x [0] = 3;
 t = one (s);
 two (x);
}

public static String one (String r)
{
 String w = "One";
 w = r;
 r = r + "one";
 return w;
}

public static void two (double[] k)
{
 double[] h = k;
 k = new double [1];
 k [0] = 5.5;
 h [1] = 8.8;
}
```
- 64 Total Points**