Sets Practice

Answer each of the following questions. Some questions may require you to do a little research.

```
illegal]?
1. Is the following code [ legal
                                                    Collection c = new Collection();
                               ıllegal 19
2. Is the following code [ legal /
                                                    Collection c = new List();
3. Is the following code [ legal]
                                illegal ]?
                                                    Collection c = new ArrayList();
                                illegal
4. Is the following code [ legal
                                                    List x = new Set();
                                illegal 15
5. Is the following code [ legal
                                                    List x = new TreeSet();
6. Is the following code [ legal
```

7. What is the big0 of the add, remove, and contains methods for a TreeSet?

illegal]?

```
O(log_2N)
                0(1)
                       / O(N)
```

8. What is the big0 of the add, remove, and contains methods for a HashSet?

```
[O(log_2N)
                  0(1)
                             O(N)
```

9. What is output by the code below?

```
Set<Integer> s = new TreeSet<Integer>();
System.out.println( s.add( 675 ) );
```

true

10. What is output by the code at right?

```
Set<Integer> s = new TreeSet<Integer>();
s.add(5);
s.add(6);
s.add(6);
s.add(7);
out.println(s);
```

Collection x = new TreeSet();

11. What is output by the code at right?

```
Set<Integer> a = new TreeSet<Integer>();
a.add(9);
out.println(a.add(6));
out.println(a.add(6));
a.add(1);
out.println(a);
```

12. What is output by the code at right?

```
Set<String> b = new TreeSet<String>();
b.add("a");
b.add("6");
b.add("A");
b.add("d");
out.println(b);
```

13. What is a set?

set is a group of items all of same type with no duplicates. 14. What does it mean when two sets are disjoint?

15. What is the cardinality of a set?

- elements in t

16. What is the complement of a set?

- a. A set that contains all elements not in the other set
- b. A set that contains only elements in the other set
- c. An equal set
- d. Elements that are in the set
- e. Elements that are not in the set

17. What is the resulting set?

$$A = \{1, 4, 5, 7\}, B = \{2, 4, 5, 9\}$$

$$A \cup B$$

18. What is the resulting set?

$$A = \{1, 4, 5, 7\}, B = \{2, 4, 5, 9\}$$

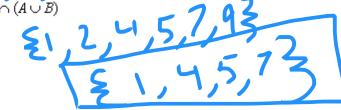
$$A \cap B$$



19. What is the resulting set?

$$A = \{1, 4, 5, 7\}, B = \{2, 4, 5, 9\}$$

$$A \cap (A \cup B)$$



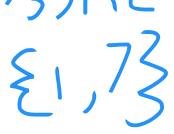
20. What is the resulting set?

$$A = \{1, 4, 5, 7\}, B = \{2, 4, 5, 9\}, C = \{1, 2, 7, 9\}$$

$$(A-B) \cap C$$

a. {1, 4, 5, 7} b. {2, 3, 5, 9}

- $\{1, 2, 7, 9\}$
- d. {1, 2, 7, d. {1, 7}
- e. Ø (empty set)



21. What is the resulting set?

$$A = \{1, 4, 5, 7\}, B = \{2, 4, 5, 9\}, C = \{1, 2, 7, 9\}$$

$$(A \cap B) \cap C$$

- a. {1, 4, 5, 7}
- b. {2, 3, 5, 9}
- c. $\{1, 2, 7, 9\}$
- d. {1, 7}
- (empty set)



22. What is the difference between a HashSet and TreeSet?

A hoshset sorts elements by hashcole and is very more efficient than a treeset. A treeset has its even ents naturally sorted.

- 23. What set operation does Set.addAll() implement?
- **a** union
- b. intersection
- c. set difference
- d. cartesian product
- e. set complement
- 24. What set operation does Set.retainAll() implement?
- a. union
- b, intersection
- c. set difference
- d. cartesian product
- e. set complement
- 25. What set operation does Set.removeAll() implement?
- a. union
- **b** intersection
- c. set difference
- d. cartesian product
- e. set complement