

Java Software Development Quiz 12

1. Which of these are core interfaces in the collections framework?

Select the three correct answers.

- (a) Set<E>
- (b) Bag<E>
- (c) LinkedList<E>
- (d) Collection<E>
- (e) Map<K,V>

2. Which of these implementations are provided by the java.util package?

Select the two correct answers.

- (a) HashList<E>
- (b) HashMap<K,V>
- (c) ArraySet<E>
- (d) ArrayMap<K,V>
- (e) TreeMap<K,V>

3. Which sequence of digits will the following program print?

```
import java.util.ArrayList;
import java.util.LinkedList;
import java.util.List;
public class Lists {
    public static void main(String[] args) {
        List<String> list = new ArrayList<String>();
        list.add("1");
        list.add("2");
        list.add(1, "3");
        List<String> list2 = new LinkedList<String>(list);
        list.addAll(list2);
        list2 = list.subList(2, 5);
        list2.clear();
        System.out.println(list);
    }
}
```

Select the one correct answer.

- (a) [1, 3, 2]
- (b) [1, 3, 3, 2]
- (c) [1, 3, 2, 1, 3, 2]
- (d) [3, 1, 2]
- (e) [3, 1, 1, 2]

(f) None of the above.

4. Which statements are true about maps?

Select the two correct answers.

- (a) The return type of the values() method is Set.
- (b) Changes made in the set view returned by keySet() will be reflected in the original map.
- (c) The Map interface extends the Collection interface.
- (d) All keys in a map are unique.
- (e) All Map implementations keep the keys sorted.

5. Which code, when inserted independently at (1), will result in the following output from the program: {1=Odd, 2=Even, 3=Odd}?

```
import java.util.Map;
import java.util.TreeMap;
public class StringMap {
    public static void main(String[] args) {
        Map<Integer, String> myMap = new TreeMap<Integer, String>();
        for (Integer key : new int[] {1, 2, 1, 3, 1, 2, 3, 3}) {
            // (1) INSERT CODE HERE ...
        }
        System.out.println(myMap);
    }
    private static String toggle(String str) {
        if (str.equals("Odd"))
            str = str.replace("Odd", "Even");
        else
            str = str.replace("Even", "Odd");
        return str;
    }
}
```

Select the one correct answer.

- (a) `String value = myMap.get(key);`
`myMap.put(key, (value == null) ? "Odd" : StringMap.toggle(value));`
- (b) `String value = myMap.get(key);`
`if (value == null)`
`value = "Odd";`
`else`
`StringMap.toggle(value);`
`myMap.put(key, value);`
- (c) `String value = myMap.get(key);`
`if (!myMap.containsKey(key))`
`myMap.put(key, "Odd");`
`else`
`StringMap.toggle(value);`
- (d) All of the above.

Answer

1. (a), (d), and (e)

Set, Collection, and Map are core interfaces in the collections framework. LinkedList is a class that implements the List interface. There is no class or interface named Bag.

2. (b) and (e)

The java.util package provides map implementations named HashMap and TreeMap. It does not provide any implementations named HashList, ArraySet, and ArrayMap.

3. (a)

[1, 3, 2] is printed. First, "1" and "2" are appended to an empty list. Next, "3" is inserted between "1" and "2", and then the list is duplicated. The original list is concatenated with the copy. The sequence of elements in the list is now "1", "3", "2", "1", "3", "2". Then a sublist view allowing access to elements from index 2 to index 5 (exclusive) is created (i.e., the subsequence "2", "1", "3"). The sublist is cleared, thus removing the elements. This is reflected in the original list and the sequence of elements is now "1", "3", "2".

4. (b) and (d)

Although all the keys in a map must be unique, multiple identical values may exist. Since values are not unique, the values() method returns a Collection instance and not a Set instance. The collection objects returned by the keySet(), entrySet(), and values() methods are backed by the original Map object. This means that changes made in one are reflected in the other. Although implementations of SortedMap keep the entries sorted on the keys, this is not a requirement for classes that implement Map. For instance, the entries in a HashMap are not sorted.

5. (a)

Strings are immutable. In (b) and (c) the argument value in the call to the method toggle() refers to the old string after completion of the call, so the value in the map is not updated with the new string.