

1

Suppose that you have a collection of products for sale in a database and you need to display those products. The products are not unique. Which of the following collections classes in the `java.util` package best suit your needs for this scenario?

- A. `Arrays`
- B. `ArrayList`
- C. `HashMap`
- D. `HashSet`
- E. `LinkedList`

2

Suppose that you need to work with a collection of elements that need to be sorted in their natural order, and each element has a unique string associated with its value. Which of the following collections classes in the `java.util` package best suit your needs for this scenario?

- A. `ArrayList`
- B. `HashMap`
- C. `HashSet`
- D. `TreeMap`
- E. `TreeSet`
- F. `Vector`

3

What is the result of the following statements?

```
3: List list = new ArrayList();
4: list.add("one");
5: list.add("two");
6: list.add(7);
7: for (String s: list)
8: System.out.print(s);
```

- A. `onetwo`
- B. `onetwo7`
- C. `onetwo` followed by an exception
- D. Compiler error on line 6
- E. Compiler error on line 7

4

What is the result of the following statements?

```
3:   ArrayDeque<String> greetings = new ArrayDeque<String>();
4:   greetings.push("hello");
5:   greetings.push("hi");
6:   greetings.push("ola");
7:   greetings.pop();
8:   greetings.peek();
9:   while (greetings.peek() != null)
10:       System.out.print(greetings.pop());
```

- A. hello
- B. hellohi
- C. hellohiola
- D. hi
- E. hihello
- F. The code does not compile.
- G. An exception is thrown.

5

Which of these statements compile? (Choose all that apply.)

- A. `HashSet<Number> hs = new HashSet<Integer>();`
- B. `HashSet<? super ClassCastException> set = new HashSet<Exception>();`
- C. `List<String> list = new Vector<String>();`
- D. `List<Object> values = new HashSet<Object>();`
- E. `List<Object> objects = new ArrayList<? extends Object>();`
- F. `Map<String, ? extends Number> hm = new HashMap<String, Integer>();`

6

What is the result of the following code?

```
1: public class Hello<T> {  
2:     T t;  
3:     public Hello(T t) { this.t = t; }  
4:     public String toString() { return t.toString(); }  
5:     public static void main(String[] args) {  
6:         System.out.print(new Hello<String>("hi"));  
7:         System.out.print(new Hello("there"));  
8:     } }
```

- A. hi
- B. hi followed by a runtime exception
- C. hithere
- D. Compiler error on line 4
- E. Compiler error on line 6
- F. Compiler error on line 7

7

Which of the following statements are true? (Select two.)

```
3: Set<Number> numbers = new HashSet<>();  
4: numbers.add(new Integer(86));  
5: numbers.add(75);  
6: numbers.add(new Integer(86));  
7: numbers.add(null);  
8: numbers.add(309L);  
9: Iterator iter = numbers.iterator();  
10: while (iter.hasNext())  
11:     System.out.print(iter.next());
```

- A. The code compiles successfully.
- B. The output is 8675null309.
- C. The output is 867586null309.
- D. The output is indeterminate.
- E. There is a compiler error on line 3.
- F. There is a compiler error on line 9.
- G. An exception is thrown.

8

What is the result of the following code?

```
TreeSet<String> tree = new TreeSet<String>();  
tree.add("one");  
tree.add("One");  
tree.add("ONE");  
System.out.println(tree.ceiling("On"));
```

- A. On
- B. one
- C. One
- D. ONE
- E. The code does not compile.
- F. An exception is thrown.

9

Which of the answer choices are valid given the following declaration?

```
Map<String, Double> map = new HashMap<>();
```

- A. map.add("pi", 3.14159);
- B. map.add("e", 2L);
- C. map.add("log(1)", new Double(0.0));
- D. map.add('x', new Double(123.4));
- E. None of the above

10

What is the result of the following program?

```
import java.util.*;

public class MyComparator implements Comparator<String> {

    public int compare(String a, String b) {
        return b.toLowerCase().compareTo(a.toLowerCase());
    }

    public static void main(String[] args) {
        String[] values = { "123", "Abb", "aab" };
        Arrays.sort(values, new MyComparator());
        for (String s: values)
            System.out.print(s + " ");
    }
}
```

- A. Abb aab 123
- B. aab Abb 123
- C. 123 Abb aab
- D. 123 aab Abb
- E. The code does not compile.
- F. A runtime exception is thrown.

11

What is the result of the following code?

```
3: Map<Integer, Integer> map = new HashMap<>(10);
4: for (int i = 1; i <= 10; i++) {
5:     map.put(i, i * i);
6: }
7: System.out.println(map.get(4));
```

- A. 16
- B. 25
- C. Compiler error on line 3.
- D. Compiler error on line 5.
- E. Compiler error on line 7.
- F. A runtime exception is thrown.

12

Which of these statements can fill in the blank so that the Helper class compiles successfully? (Choose all that apply.)

```
3: public class Helper {
4:     public static <U extends Exception> void printException(U u) {
5:         System.out.println(u.getMessage());
6:     }
7:     public static void main(String[] args) {
8:         _____
9:     } }
```

- A. Helper.printException(new FileNotFoundException("A"));
- B. Helper.printException(new Exception("B"));
- C. Helper.<Throwable>printException(new Exception("C"));
- D. Helper.<NullPointerException>printException(new NullPointerException("D"));
- E. Helper.printException(new Throwable("E"));

13

Which of these statements can fill in the blank so that the Wildcard class compiles successfully? (Choose all that apply.)

```
import java.util.*;

public class Wildcard {
    public void showSize(List<?> list) {
        System.out.println(list.size());
    }
    public static void main(String[] args) {
        Wildcard card = new Wildcard();
        _____
        card.showSize(list);
    } }
```

- A. ArrayDeque<?> list = new ArrayDeque<String>();
- B. ArrayList<? super Date> list = new ArrayList<Date>();
- C. List<?> list = new ArrayList<?>();
- D. List<Exception> list = new LinkedList<java.io.IOException>();
- E. Vector<? extends Number> list = new Vector<Integer>();
- F. None of the above

What is the result of the following program?

```
import java.util.*;
public class Sorted implements Comparable<Sorted>, Comparator<Sorted> {
    private int num;
    private String text;

    Sorted(int n, String t) {
        this.num = n;
        this.text = t;
    }
    public String toString() { return "" + num; }
    public int compareTo(Sorted s) { return text.compareTo(s.text); }
    public int compare(Sorted s1, Sorted s2) { return s1.num - s2.num; }

    public static void main(String[] args) {
        Sorted s1 = new Sorted(88, "a");
        Sorted s2 = new Sorted(55, "b");
        TreeSet<Sorted> t1 = new TreeSet<>();
        t1.add(s1); t1.add(s2);
        TreeSet<Sorted> t2 = new TreeSet<>(s1);
        t2.add(s1); t2.add(s2);
        System.out.println(t1 + " " + t2);
    } }
```

- A. [55. 88] [55, 88]
- B. [55. 88] [88, 55]
- C. [88. 55] [55, 88]
- D. [88. 55] [88, 55]
- E. The code does not compile.
- F. A runtime exception is thrown.

15

What is the result of the following code?

```
Comparator<Integer> c = (o1, o2) -> o2-o1;  
List<Integer> list = Arrays.asList(5, 4, 7, 1);  
Collections.sort(list, c);  
System.out.println(Collections.binarySearch(list, 1));
```

- A. 0
- B. 1
- C. 2
- D. The result is undefined.
- E. The code does not compile.
- F. A runtime exception is thrown.

16

Which of the following statements are true? (Choose all that apply.)

- A. Comparable is in the java.util package.
- B. Comparator is in the java.util package.
- C. compare() is in the Comparable interface.
- D. compare() is in the Comparator interface.
- E. compare() takes one method parameter.
- F. compare() takes two method parameters.

17

Which two options can fill in the blanks to make this code compile? (Choose all that apply.)

```
1: public class Generic_____ {  
2:     public static void main(String[] args) {  
3:         Generic<String> g = new Generic_____( );  
4:         Generic<Object> g2 = new Generic( );  
5:     }  
6: }
```

- A. On line 1, fill in with <>.
- B. On line 1, fill in with <T>.
- C. On line 1, fill in with <?>.
- D. On line 3, fill in with <>.
- E. On line 3, fill in with <T>.
- F. On line 3, fill in with <?>.



18

Which of the following lines can be inserted to make the code compile? (Choose all that apply.)

```
class A {}  
class B extends A {}  
class C extends B {}  
  
class D<C> {  
    // INSERT CODE HERE  
}
```

- A. A a1 = new A();
- B. A a2 = new B();
- C. A a3 = new C();
- D. C c1 = new A();
- E. C c2 = new B();
- F. C c1 = new C();

19

Which options are true of the following code? (Choose all that apply.)

```
3: _____<Integer> q = new LinkedList<>();  
4:   q.add(10);  
5:   q.add(12);  
6:   q.remove(1);  
7:   System.out.print(q);
```

- A. If we fill in the blank with List, the output is [10].
- B. If we fill in the blank with List, the output is [10, 12].
- C. If we fill in the blank with Queue, the output is [10].
- D. If we fill in the blank with Queue, the output is [10, 12].
- E. The code does not compile in either scenario.
- F. A runtime exception is thrown.

20

What is the result of the following code?

```
4: Map m = new HashMap();  
5: m.put(123, "456");  
6: m.put("abc", "def");  
7: System.out.println(m.contains("123"));
```

- A. false
- B. true
- C. Compiler error on line 4.
- D. Compiler error on line 5.
- E. Compiler error on line 7.
- F. A runtime exception is thrown.

21

What code change is needed to make the method compile?

```
public static T identity(T t) {  
    return t;  
}
```

- A. Add <T> after the public keyword.
- B. Add <T> after the static keyword.
- C. Add <T> after T.
- D. Add <?> after the public keyword.
- E. Add <?> after the static keyword.
- F. No change required. The code already compiles.