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Question Bank

Chapter 12 : Collections and Generics



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12. Collections and Generics

Q: 01 Given:

```
34. HashMap props = new HashMap();
35. props.put("key45", "some value");
36. props.put("key12", "some other value");
37. props.put("key39", "yet another value");
38. Set s = props.keySet();
39. // insert code here
```

What, inserted at line 39, will sort the keys in the props HashMap?

- A. Arrays.sort(s);
- B. s = new TreeSet(s);
- C. Collections.sort(s);
- D. s = new SortedSet(s);

Answer: B

Q: 02 Click the Exhibit button.

Which statement is true about the set variable on line 12?

```
1. import java.util.*;
2. public class TestSet {
3.     enum Example { ONE, TWO, THREE }
4.     public static void main(String[] args)
5.     {
6.         Collection coll = new ArrayList();
7.         coll.add(Example.THREE);
8.         coll.add(Example.THREE);
9.         coll.add(Example.THREE);
10.        coll.add(Example.TWO);
11.        coll.add(Example.TWO);
12.        Set set = new HashSet(coll);
13.    }
14. }
```

- A. The set variable contains all six elements from the coll collection, and the order is guaranteed to be preserved.
- B. The set variable contains only three elements from the coll collection, and the order is guaranteed to be preserved.
- C. The set variable contains all six elements from the coll collection, but the order is NOT guaranteed to be preserved.
- D. The set variable contains only three elements from the coll collection, but the order is NOT guaranteed to be preserved.

Answer: D

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Q: 03 Given:

```
23. Object [] myObjects = {  
24. new Integer(12),  
25. new String("foo"),  
26. new Integer(5),  
27. new Boolean(true)  
28. };  
29. Arrays.sort(myObjects);  
30. for(int i=0; i<myObjects.length; i++) {  
31. System.out.print(myObjects[i].toString());  
32. System.out.print(" ");  
33. }
```

What is the result?

- A. Compilation fails due to an error in line 23.
- B. Compilation fails due to an error in line 29.
- C. A ClassCastException occurs in line 29.
- D. A ClassCastException occurs in line 31.
- E. The value of all four objects prints in natural order.

Answer: C

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Q: 04 Click the Task button.

Place code into the class so that it compiles and generates the output
answer=42. Note: Code options may be used more than once.

Class

```
public class Place here {  
    private Place here object;  
    public Place here (Place here object) {  
        this.object = object;  
    }  
    public Place here getObject() {  
        return object;  
    }  
  
    public static void main(String[] args) {  
        Gen<String> str = new Gen<String>("answer");  
        Gen<Integer> intg = new Gen<Integer>(42);  
        System.out.println(str.getObject() + "=" +  
            intg.getObject());  
    }  
}
```

Code Options

Gen<T>

Gen<?>

Gen

?

T

Done

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Solution:

- 1.Gen<T>
- 2.T
- 3.Gen
- 4.T
- 5.T

Q: 05 Click the Task button.

Given:

```
public void takeList(List<? extends String> list) {  
    // insert code here  
}
```

Place the Compilation Results on each code statement to indicate whether or not that code will compile if inserted into the takeList() method.

Code Statements

- ☐ list.add("Foo");
- ☐ list = new ArrayList<String>();
- ☐ list = new ArrayList<Object>();
- ☐ String s = list.get(0);
- ☐ Object o = list;

Compilation Results

- ☐ Compilation succeeds
- ☐ Compilation fails

Done

Solution:

1. list.add("foo"); ----- Compilation fails
2. list = new ArrayList<String>(); -----Compilation succeeds
3. list=new ArrayList<Object>(); ---- Compilation fails
4. String s = list.get(0); ----- Compilation succeeds
5. Object o = list; ----- Compilation succeeds

Q: 06 Given:

1. public class Person {
2. private String name;
3. public Person(String name) { this.name = name; }
4. public boolean equals(Person p) {
5. return p.name.equals(this.name);
6. }

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7. }

Which statement is true?

- A. The equals method does NOT properly override the Object.equals method.
- B. Compilation fails because the private attribute p.name cannot be accessed in line 5.
- C. To work correctly with hash-based data structures, this class must also implement the hashCode method.
- D. When adding Person objects to a java.util.Set collection, the equals method in line 4 will prevent duplicates.

Answer: A

Q: 07 Given:

```
1. import java.util.*;
2. public class Old {
3.     public static Object get0(List list) {
4.         return list.get(0);
5.     }
6. }
```

Which three will compile successfully? (Choose three.)

- A. Object o = Old.get0(new LinkedList());
- B. Object o = Old.get0(new LinkedList<?>());
- C. String s = Old.get0(new LinkedList<String>());
- D. Object o = Old.get0(new LinkedList<Object>());
- E. String s = (String)Old.get0(new LinkedList<String>());

Answer: A, D, E

Q: 08 Given:

```
1. import java.util.*;
2. public class Example {
3.     public static void main(String[] args) {
4.         // insert code here
5.         set.add(new Integer(2));
6.         set.add(new Integer(1));
7.         System.out.println(set);
8.     }
9. }
```

Which code, inserted at line 4, guarantees that this program will output [1, 2]?

- A. Set set = new TreeSet();
- B. Set set = new HashSet();
- C. Set set = new SortedSet();
- D. List set = new SortedList();
- E. Set set = new LinkedHashSet();

Answer: A

Q: 09 Given:

```
11. public static Collection get() {
12.     Collection sorted = new LinkedList();
13.     sorted.add("B"); sorted.add("C"); sorted.add("A");
14.     return sorted;
15. }
```


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```
16. public static void main(String[] args) {
17. for (Object obj: get()) {
18. System.out.print(obj + ", ");
19. }
20. }
```

What is the result?

- A. A, B, C,
- B. B, C, A,
- C. Compilation fails.
- D. The code runs with no output.
- E. An exception is thrown at runtime.

Answer: B

Q:10 given

Click the Task button.

Place the correct description of the compiler output on the code fragments to be inserted at lines 4 and 5. The same compiler output may be used more than once.

```
1. import java.util.*;
2. public class X {
3.     public static void main(String[] args) {
4.         // insert code here
5.         // insert code here
6.     }
7.     public static void foo(List<Object> list) {
8.     } }
```

Code

```
ArrayList<String> x1 = new ArrayList<String>();
foo(x1);
```

```
ArrayList<Object> x2 = new ArrayList<String>();
foo(x2);
```

```
ArrayList<Object> x3 = new ArrayList<Object>();
foo(x3);
```

```
ArrayList x4 = new ArrayList();
foo(x4);
```

Compiler Output

Compilation succeeds.

Compilation fails due to an error in the first statement.

Compilation of the first statement succeeds, but compilation fails due to an error in the second statement.

Done

Solution:

1. Compilation of the first statement succeeds ,but compilation fails due to an error in the second statement.
2. Compilation fails due to an error in the first statement
3. Compilation succeeds

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4. Compilation succeeds

Q: 11 Given:

```

11. public static Iterator reverse(List list) {
12. Collections.reverse(list);
13. return list.iterator();
14. }
15. public static void main(String[] args) {
16. List list = new ArrayList();
17. list.add("1"); list.add("2"); list.add("3");
18. for (Object obj: reverse(list))
19. System.out.print(obj + " ");
20. }

```

What is the result?

- A. 3, 2, 1, B. 1, 2, 3,
C. Compilation fails. D. The code runs with no output.
E. An exception is thrown at runtime.

Answer: C

Q: 12 Click the Task button.

Given:

```

1. import java.util.*;
2. class A { }
3. class B extends A { }
4. public class Test {
5.     public static void main(String[] args) {
6.         List<A> listA = new LinkedList<A>();
7.         List<B> listB = new LinkedList<B>();
8.         List<Object> listO = new LinkedList<Object>();
9.         // insert code here
10.    }
11.    public static void m1(List<? extends A> list) { }
12.    public static void m2(List<A> list) { }
13. }

```

Place a result onto each method call to indicate what would happen if the method call were inserted at line 9. Note: Results can be used more than once.

Method Calls		Result
m1(listA);	m2(listA);	Does not compile.
m1(listB);	m2(listB);	Compiles and runs without error.
m1(listO);	m2(listO);	An exception is thrown at runtime.

=====does not compile=====

```
1.m1(listO );
```

```
2.m2(listB);
```

```
3.m2(listO);
```

=====compiles and runs with out error=====

```
1.m1(listA);
```

```
2.m1(listB);
```

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3.m2(listA);

Q: 13 Given:

```
1. import java.util.*;
2. public class PQ {
3. public static void main(String[] args) {
4. PriorityQueue<String> pq = new PriorityQueue<String>();
5. pq.add("carrot");
6. pq.add("apple");
7. pq.add("banana");
8. System.out.println(pq.poll() + ":" + pq.peek());
9. }
10. }
```

What is the result?

- A. apple:apple
- B. carrot:apple
- C. apple:banana
- D. banana:apple
- E. carrot:carrot
- F. carrot:banana

Answer: C



Q: 14 Given:

```
1. import java.util.*;
2. public class WrappedString {
3. private String s;
4. public WrappedString(String s) { this.s = s; }
5. public static void main(String[] args) {
6. HashSet<Object> hs = new HashSet<Object>();
7. WrappedString ws1 = new WrappedString("aardvark");
8. WrappedString ws2 = new WrappedString("aardvark");
9. String s1 = new String("aardvark");
10. String s2 = new String("aardvark");
11. hs.add(ws1); hs.add(ws2); hs.add(s1); hs.add(s2);
12. System.out.println(hs.size()); } }
```

What is the result?

- A. 0

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- B. 1
- C. 2
- D. 3
- E. 4
- F. Compilation fails.
- G. An exception is thrown at runtime.

Answer: D

Q: 15 Given:

```
11. public class Key {  
12.     private long id1;  
13.     private long id2;  
14.  
15. // class Key methods  
16. }
```

A programmer is developing a class Key, that will be used as a key in a standard java.util.HashMap. Which two methods should be overridden to assure that Key works correctly as a key? (Choose two.)

- A. public int hashCode()
- B. public boolean equals(Key k)
- C. public int compareTo(Object o)
- D. public boolean equals(Object o)
- E. public boolean compareTo(Key k)

Answer: A, D

Q: 16 Given a pre-generics implementation of a method:

```
11. public static int sum(List list) {  
12.     int sum = 0;  
13.     for ( Iterator iter = list.iterator(); iter.hasNext(); ) {  
14.         int i = ((Integer)iter.next()).intValue();  
15.         sum += i;  
16.     }  
17.     return sum;  
18. }
```

Which three changes must be made to the method sum to use generics? (Choose three.)

- A. remove line 14
- B. replace line 14 with "int i = iter.next();"
- C. replace line 13 with "for (int i : intList) {"
- D. replace line 13 with "for (Iterator iter : intList) {"
- E. replace the method declaration with "sum(List<int> intList)"
- F. replace the method declaration with "sum(List<Integer> intList)"

Answer: A, C, F

Q: 17 Given:

```
11. // insert code here  
12. private N min, max;  
13. public N getMin() { return min; }  
14. public N getMax() { return max; }
```

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```
15. public void add(N added) {  
16. if (min == null || added.doubleValue() < min.doubleValue()) 17. min = added;  
18. if (max == null || added.doubleValue() > max.doubleValue()) 19. max = added;  
20. }  
21. }
```

Which two, inserted at line 11, will allow the code to compile? (Choose two.)

- A. public class MinMax<?> {
- B. public class MinMax<? extends Number> {
- C. public class MinMax<N extends Object> {
- D. public class MinMax<N extends Number> {
- E. public class MinMax<? extends Object> {
- F. public class MinMax<N extends Integer> {

Answer: D, F

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Q: 18 Given:

```
1. import java.util.*;  
2.  
3. public class LetterASort{  
4. public static void main(String[] args) {  
5. ArrayList<String> strings = new ArrayList<String>();  
6. strings.add("aAaA");  
7. strings.add("AaA");  
8. strings.add("aAa");  
9. strings.add("AAaa");  
10. Collections.sort(strings);  
11. for (String s : strings) { System.out.print(s + " "); }  
12. }  
13. }
```

What is the result?

- A. Compilation fails.
- B. aAaA aAa AAaa AaA
- C. AAaa AaA aAa aAaA
- D. AaA AAaa aAaA aAa
- E. aAa AaA aAaA AAaa
- F. An exception is thrown at runtime.

Answer: C

Q: 19 Click the Task button.

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Given: `NumberNames nn = new NumberNames();`
`nn.put("one", 1);`
`System.out.println(nn.getNames());`

Place the code into position to create a class that maps from Strings to integer values. The result of execution must be [one]. Some options may be used more than once.

```
public class NumberNames {  
    private HashMap<Place here , Place here > map =  
        new HashMap<Place here , Place here Place here >;  
    public void put(String name, int value) {  
        map.put(Place here , Place here );  
    }  
    public Place here getNames() {  
        return map.keySet();  
    }  
}
```

Code

Set<int>	Set<Integer>	HashSet
Set<Integer, String>	Set<int, String>	Set<String, Integer>
Set<String, int>	Set<String>	NumberNames
String	Integer	int
>()	name	value
>		map

Done

Solution:

```
public class NumberNames{  
    private HashMap<String , Integer> map=  
        new HashMap<String , Integer >();  
    public void put(String name , int Value) {  
        map.put(name , Value);  
    }  
    public Set<String> getNames() {  
        return map.keySet();  
    }  
}
```

Q: 20 Which two statements are true about the hashCode method? (Choose two.)

- A. The hashCode method for a given class can be used to test for object equality and object inequality for that class.
- B. The hashCode method is used by the java.util.SortedSet collection class to order the elements within that set.
- C. The hashCode method for a given class can be used to test for object inequality, but NOT object equality, for that class.

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- D. The only important characteristic of the values returned by a hashCode method is that the distribution of values must follow a Gaussian distribution.
- E. The hashCode method is used by the java.util.HashSet collection class to group the elements within that set into hash buckets for swift retrieval.

Answer: C, E

Q: 21 Click the Task button.

Place the code in the appropriate places such that this program will always output [1, 2].

```
import java.util.*;

public class MyInt {
    public static void main(String[] args) {
        ArrayList<MyInt> list = new ArrayList<MyInt>();
        list.add(new MyInt(2));
        list.add(new MyInt(1));
        Collections.sort(list);
        System.out.println(list);
    }
    private int i;
    public MyInt(int i) { this.i = i; }
    public String toString() { return Integer.toString(i); }

    Place here int Place here {
        MyInt i2 = (MyInt)o;
        return Place here ;
    }
}
```

Code

implements	extends	Sortable	Object	Comparable
protected	public	i - i2.i	i	i2.i - i
compare(MyInt o, MyInt i2)	compare(Object o, Object i2)			
sort(Object o)	sort(MyInt o)			
compareTo(MyInt o)	compareTo(Object o)			

Done

Solution:

- 1.implements
- 2.comparable
- 3.public
- 4.coompareTo(Object o)
5. i

Q: 22 A programmer has an algorithm that requires a java.util.List that provides an efficient implementation of add(0, object), but does NOT need to support quick random access.

What supports these requirements?

A. java.util.Queue

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- B. java.util.ArrayList
- C. java.util.LinearList
- D. java.util.LinkedList

Answer: D

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Q: 23 Click the Task button.

Place each Collection Type on the statement to which it applies.

Statements	Collection Types
allows access to elements by their integer index	<code>java.util.Map</code>
defines the method: <code>V get(Object key)</code>	<code>java.util.Set</code>
is designed for holding elements prior to processing	<code>java.util.List</code>
contains no pair of elements <code>e1</code> and <code>e2</code> , such that <code>e1.equals(e2)</code>	<code>java.util.Queue</code>

Solution:

(1)----- (3) (2)----- (1) (3)----- (4) (4)----- (2)

Q: 24 Given:

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```
10. interface A { void x(); }
11. class B implements A { public void x() {} public void y() {} }
12. class C extends B { public void x() {} }
And:
20. java.util.List<A> list = new java.util.ArrayList<A>();
21. list.add(new B());
22. list.add(new C());
23. for (A a : list) {
24.     a.x();
25.     a.y();
26. }
```

What is the result?

- A. The code runs with no output.
- B. An exception is thrown at runtime.
- C. Compilation fails because of an error in line 20.
- D. Compilation fails because of an error in line 21.
- E. Compilation fails because of an error in line 23.
- F. Compilation fails because of an error in line 25.

Answer: F

Q: 25 Click the Task button.

Place the correct description of the compiler output on the code fragments to be inserted at lines 4 and 5. The same compiler output may be used more than once.

```
1. import java.util.*;
2. public class X {
3.     public static void main(String[] args) {
4.         // insert code here
5.         // insert code here
6.     }
7.     public static void foo(List<Object> list) {
8.     } }
```

Code

ArrayList<String> x1 = new ArrayList<String>();
foo(x1);

ArrayList<Object> x2 = new ArrayList<String>();
foo(x2);

ArrayList<Object> x3 = new ArrayList<Object>();
foo(x3);

ArrayList x4 = new ArrayList();
foo(x4);

Compiler Output

Compilation succeeds.

Compilation fails due to an error in the first statement.

Compilation of the first statement succeeds, but compilation fails due to an error in the second statement.

Done

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Solution:

4. Compilation of the first statement succeeds ,but compilation fails due to an error in the second statement.
5. Compilation fails due to an error in the first statement
6. Compilation succeeds
7. Compilation succeeds

Q: 26 Click the Task button.

Given:

```
public void takeList(List<? extends String> list) {  
    // insert code here  
}
```

Place the Compilation Results on each code statement to indicate whether or not that code will compile if inserted into the takeList() method.

Code Statements

<code>list.add("Foo");</code>
<code>list = new ArrayList<String>();</code>
<code>list = new ArrayList<Object>();</code>
<code>String s = list.get(0);</code>
<code>Object o = list;</code>

Compilation Results

Compilation succeeds
Compilation fails

Done

Solution:

1. list.add("foo"); ----- Compilation fails
2. list = new ArrayList<String>(); -----Compilation succeeds
3. list=new ArrayList<Object>(); ---- Compilation fails
4. String s = list.get(0); ----- Compilation succeeds
5. Object o = list; ----- Compilation succeeds

Q: 27 Given:

1. public class Drink implements Comparable {
2. public String name;
3. public int compareTo(Object o) {
4. return 0;
5. }
6. }

and:

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```
20. Drink one = new Drink();
21. Drink two = new Drink();
22. one.name= "Coffee";
23. two.name= "Tea";
23. TreeSet set = new TreeSet();
24. set.add(one);
25. set.add(two);
```

A programmer iterates over the TreeSet and prints the name of each Drink object.

What is the result?

- A. Tea
- B. Coffee
- C. Coffee Tea
- D. Compilation fails.
- E. The code runs with no output.
- F. An exception is thrown at runtime.

Answer: B



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Q:28 Click the Task button.

Given the class definitions:

```
class Animal { }
class Dog extends Animal { }
```

and the code:

```
public void go() {
    ArrayList<Dog> aList = new ArrayList<Dog>();
    takeList(aList);
}
// insert definition of the takeList() method here
```

Place the correct Compilation Result on each takeList() method definition to indicate whether or not the go() method would compile given that definition.

takeList() Method Definition

<code>public void takeList(ArrayList list) { }</code>
<code>public void takeList(ArrayList<Animal> list) { }</code>
<code>public void takeList(ArrayList<? extends Animal> list) { }</code>
<code>public void takeList(ArrayList<?> list) { }</code>
<code>public void takeList(ArrayList<Object> list) { }</code>

Compilation Result

Compilation succeeds.
Compilation fails.

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Solutions:

compilation fails:

Public void takeList(ArrayList<Animal> list) { }

Public void takeList(ArrayList<Object> list) { }

compilation Succeeds

All the remaining

Q: 29 Click the Task button.

Given:

```
1. import java.util.*;
2. public class TestGenericConversion {
3.     public static void main(String[] args) {
4.         List list = new LinkedList();
5.         list.add("one");
6.         list.add("two");
7.         System.out.print(((String)list.get(0)).length());
8.     }
9. }
```

Refactor this class to use generics without changing the code's behavior.

```
1. import java.util.*;
2. public class TestGenericConversion {
3.     public static void main(String[] args) {
4.         Place here
5.         list.add("one");
6.         list.add("two");
7.         Place here
8.     }
9. }
```

Code

List list = new LinkedList();	System.out.print(list.get(0).length());
List<String> list = new LinkedList<String>();	System.out.print(list.get<String>(0).length());
List<String> list = new LinkedList();	System.out.print(<String>list.get(0).length());
List list = new LinkedList<String>();	System.out.print(((List<String>)list.get(0)).length());

Solution:

```
import java.util.*;
public class TestGenericConversion {
    public static void main(String s[] ){
        List<String> list=new LinkedList<String>( );
        list.add("one");
        list.add("two");
        System.out.println(list.get(0).length(); }
    }
```

Q: 30 Given:

```
10. abstract public class Employee {
11. protected abstract double getSalesAmount();
12. public double getCommision() {
13. return getSalesAmount() * 0.15;
14. }
```

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15. }

16. class Sales extends Employee {

17. // insert method here

18. }

Which two methods, inserted independently at line 17, correctly complete the Sales class?
(Choose two.)

- A. double getSalesAmount() { return 1230.45; }
- B. public double getSalesAmount() { return 1230.45; }
- C. private double getSalesAmount() { return 1230.45; }
- D. protected double getSalesAmount() { return 1230.45; }

Answer: B, D

Q: 31 Given:

13. public static void search(List<String> list) {

14. list.clear();

15. list.add("b");

16. list.add("a");

17. list.add("c");

18. System.out.println(Collections.binarySearch(list, "a"));

19. }

What is the result of calling search with a valid List implementation?

- A. 0
- B. 1
- C. 2
- D. a
- E. b
- F. c
- G. The result is undefined.

Answer: G

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Q: 32 Given:

11. public static void append(List list) { list.add("0042"); }

12. public static void main(String[] args) {

13. List<Integer> intList = new ArrayList<Integer>();

14. append(intList);

15. System.out.println(intList.get(0));

16. }

What is the result?

- A. 42
- B. 0042
- C. An exception is thrown at runtime.
- D. Compilation fails because of an error in line 13.
- E. Compilation fails because of an error in line 14.

Answer: B

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Q: 33 Given:

```
11. public class Person {  
12.     private name;  
13.     public Person(String name) {  
14.         this.name = name;  
15.     }  
16.     public int hashCode() {  
17.         return 420;  
18.     }  
19. }
```

Which statement is true?

- A. The time to find the value from HashMap with a Person key depends on the size of the map.
- B. Deleting a Person key from a HashMap will delete all map entries for all keys of type Person.
- C. Inserting a second Person object into a HashSet will cause the first Person object to be removed as a duplicate.
- D. The time to determine whether a Person object is contained in a HashSet is constant and does NOT depend on the size of the map.

Answer: A

Q: 34

A programmer must create a generic class MinMax and the type parameter of MinMax must implement Comparable. Which implementation of MinMax will compile?

- A.

```
class MinMax<E extends Comparable<E>> {  
    E min = null;  
    E max = null;  
    public MinMax() {}  
    public void put(E value) { /* store min or max */ }  
}
```
- B.

```
class MinMax<E implements Comparable<E>> {  
    E min = null;  
    E max = null;  
    public MinMax() {}  
    public void put(E value) { /* store min or max */ }  
}
```
- C.

```
class MinMax<E extends Comparable<E>> {  
    <E> E min = null;  
    <E> E max = null;  
    public MinMax() {}  
    public <E> void put(E value) { /* store min or max */ }  
}
```
- D.

```
class MinMax<E implements Comparable<E>> {  
    <E> E min = null;  
    <E> E max = null;  
    public MinMax() {}  
    public <E> void put(E value) { /* store min or max */ }  
}
```

Answer: A

Q: 35 Given:

int[] myArray = new int[] {1, 2, 3, 4, 5}; What allows you to create a list from this array?

- A. `List myList = myArray.asList();`
- B. `List myList = Arrays.asList(myArray);`
- C. `List myList = new ArrayList(myArray);`

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D. List myList = Collections.fromArray(myArray);

Answer: B

Question: 36

Given:

1. public class Score implements Comparable<Score> {
2. private int wins, losses;
3. public Score(int w, int l) { wins = w; losses = l; }
4. public int getWins() { return wins; }
5. public int getLosses() { return losses; }
6. public String toString() {
7. return "< " + wins + " , " + losses + " >";
8. }
9. // insert code here
10. }

Which method will complete this class?

- A. public int compareTo(Object o) { /*mode code here*/ }
- B. public int compareTo(Score other) { /*more code here*/ }
- C. public int compare(Score s1, Score s2) { /*more code here*/ }
- D. public int compare(Object o1, Object o2) { /*more code here*/ }

Answer: B

Question: 37

Click the Exhibit button.

1. import java.util.*;
2. class KeyMaster {
3. public int i;
4. public KeyMaster(int i) { this.i = i; }
5. public boolean equals(Object o) { return i == ((KeyMaster)o).i; }
6. public int hashCode() { return i; }
7. }
8. public class MapIt {
9. public static void main(String[] args) {
10. Set<KeyMaster> set = new HashSet<KeyMaster>();
11. KeyMaster k1 = new KeyMaster(1);
12. KeyMaster k2 = new KeyMaster(2);
13. set.add(k1); set.add(k1);
14. set.add(k2); set.add(k2);
15. System.out.print(set.size() + " : ");
16. k2.i = 1;
17. System.out.print(set.size() + " : ");
18. set.remove(k1);
19. System.out.print(set.size() + " : ");
20. set.remove(k2);
21. System.out.print(set.size());
22. }
23. }

What is the result?

- | | |
|------------|------------|
| A. 4:4:2:2 | B. 4:4:3:2 |
| C. 2:2:1:0 | D. 2:2:0:0 |

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E. 2:1:0:0

F. 2:2:1:1

G. 4:3:2:1

Answer: F



Question: 38

Given:

```
1. import java.util.*;  
2. public class Test {  
3.     public static void main(String[] args) {  
4.         List<String> strings = new ArrayList<String>();  
5.         // insert code here  
6.     }  
7. }
```

Which four, inserted at line 5, will allow compilation to succeed?

(Choose four.)

- A. String s = strings.get(0);
- B. Iterator i1 = strings.iterator();
- C. String[] array1 = strings.toArray();
- D. Iterator<String> i2 = strings.iterator();
- E. String[] array2 = strings.toArray(new String[1]);
- F. Iterator<String> i3 = strings.iterator<String>();

Answer: ABDE

Question: 39

Given:

```
classA {}  
class B extends A {}  
class C extends A {}  
class D extends B {}
```

Which three statements are true? (Choose three.)

- A. The type List<A> is assignable to List.
- B. The type List is assignable to List<A>.
- C. The type List<Object> is assignable to List<?>.
- D. The type List<D> is assignable to List<? extends B>.
- E. The type List<? extends A> is assignable to List<A>.
- F. The type List<Object> is assignable to any List reference.
- G. The type List<? extends B> is assignable to List<? extends A>.

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Answer: CDG

Question:40

Given:

```
11. public void addStrings(List list) {  
12. list.add("foo");  
13. list.add("bar");  
14. }
```

What must you change in this method to compile without warnings?

A. add this code after line 11:

list = (List<String>) list;

B. change lines 12 and 13 to:

list.add<String>("foo");

list.add<String>("bar");

C. change the method signature on line 11 to:

public void addStrings(List<? extends String> list) {

D. change the method signature on line 11 to:

public void addStrings(List<? super String> list) {

E. No changes are necessary. This method compiles without warnings.

Answer: D

Question: 41

Given:

```
1. public class Test {  
2. public <T extends Comparable> T findLarger(T x, T y) {  
3. if(x.compareTo(y) > 0) {  
4. return x;  
5. } else {  
6. return y;  
7. }  
8. }  
9. }
```

and:

```
22. Test t = new Test();
```

```
23. // insert code here
```

Which two will compile without errors when inserted at line 23?

(Choose two.)

A. Object x = t.findLarger(123, "456");

B. int x = t.findLarger(123, new Double(456));

C. int x = t.findLarger(123, new Integer(456));

D. int x = (int) t.findLarger(new Double(123), new Double(456));

Answer: AC

Question: 42

Given:

```
11. List list = // more code here
```

```
12. Collections.sort(list, new MyComparator());
```

Which code will sort this list in the opposite order of the sort in line

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12?

- A. Collections.reverseSort(list, new MyComparator());
- B. Collections.sort(list, new MyComparator());
list.reverse();
- C. Collections.sort(list, new InverseComparator(
new MyComparator()));
- D. Collections.sort(list, Collections.reverseOrder(
new MyComparator()));

Answer: D

Question: 43

Given:

**ArrayList a = new ArrayList();
containing the values {"1", "2", "3", "4", "5", "6", "7", "8"}
Which code will return 2?**

- A. Collections.sort(a, a.reverse());
int result = Collections.binarySearch(a, "6");
- B. Comparator c = Collections.reverseOrder();
Collections.sort(a, c);
int result = Collections.binarySearch(a, "6");
- C. Comparator c = Collections.reverseOrder();
Collections.sort(a, c);
int result = Collections.binarySearch(a, "6", c);
- D. Comparator c = Collections.reverseOrder(a);
Collections.sort(a, c);
int result = Collections.binarySearch(a, "6", c);
- E. Comparator c = new InverseComparator(new Comparator());
Collections.sort(a);
int result = Collections.binarySearch(a, "6", c);

Answer: C

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Question: 44

Given:

```
11. public class Counter {  
12. public static void main(String[] args) {  
13. int numArgs = /* insert code here */;  
14. }  
15. }
```

and the command line:

java Counter one fred 42

Which code, inserted at line 13, captures the number of arguments passed into the program?

- A. args.count
- B. args.length
- C. args.count()
- D. args.length()
- E. args.getLength()

Answer: B

Question: 45

Given:

```
3. import java.util.*;  
4. public class Mapit {  
5. public static void main(String[] args) {  
6. Set<Integer> set = new HashSet<Integer>();  
7. Integer i1 = 45;  
8. Integer i2 = 46;  
9. set.add(i1);  
10. set.add(i1);  
11. set.add(i2); System.out.print(set.size() + " ");  
12. set.remove(i1); System.out.print(set.size() + " ");  
13. i2 = 47;  
14. set.remove(i2); System.out.print(set.size() + " ");  
15. }  
16. }
```

What is the result?

- A. 2 1 0
- B. 2 1 1
- C. 3 2 1
- D. 3 2 2
- E. Compilation fails.
- F. An exception is thrown at runtime.

Answer: B

Question: 46

Given:

```
12. import java.util.*;  
13. public class Explorer1 {
```


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```
14. public static void main(String[] args) {
15. TreeSet<Integer> s = new TreeSet<Integer>();
16. TreeSet<Integer> subs = new TreeSet<Integer>();
17. for(int i = 606; i < 613; i++) 18. if(i%2 == 0) s.add(i);
19. subs = (TreeSet)s.subSet(608, true, 611, true);
20. s.add(609);
21. System.out.println(s + " " + subs);
22. }
23. }
```

What is the result?

- A. Compilation fails.
- B. An exception is thrown at runtime.
- C. [608, 609, 610, 612] [608, 610]
- D. [608, 609, 610, 612] [608, 609, 610]
- E. [606, 608, 609, 610, 612] [608, 610]
- F. [606, 608, 609, 610, 612] [608, 609, 610]

Answer: F

Question: 47

Given:

```
3. import java.util.*;
4. public class Quest {
5. public static void main(String[] args) {
6. String[] colors = {"blue", "red", "green", "yellow", "orange"};
7. Arrays.sort(colors);
8. int s2 = Arrays.binarySearch(colors, "orange");
9. int s3 = Arrays.binarySearch(colors, "violet");
10. System.out.println(s2 + " " + s3);
11. }
12. }
```

What is the result?

- A. 2 -1
- B. 2 -4
- C. 2 -5
- D. 3 -1
- E. 3 -4
- F. 3 -5
- G. Compilation fails.
- H. An exception is thrown at runtime.

Answer: C

Question: 48

Given:

```
5. import java.util.*;
6. public class SortOf {
7. public static void main(String[] args) {
8. ArrayList<Integer> a = new ArrayList<Integer>();
9. a.add(1); a.add(5); a.add(3);
11. Collections.sort(a);
12. a.add(2);
```

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13. `Collections.reverse(a);`

14. `System.out.println(a);`

15. `}`

16. `}`

What is the result?

A. [1, 2, 3, 5]

B. [2, 1, 3, 5]

C. [2, 5, 3, 1]

D. [5, 3, 2, 1]

E. [1, 3, 5, 2]

F. Compilation fails.

G. An exception is thrown at runtime.

Answer: C

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Question: 49

Given:

3. `import java.util.*;`

4. `public class Hancock {`

5. `// insert code here` 6. `list.add("foo");`

7. `}`

8. `}`

Which two code fragments, inserted independently at line 5, will compile without warnings? (Choose two.)

A. `public void addStrings(List list) {`

B. `public void addStrings(List<String> list) {`

C. `public void addStrings(List<? super String> list) {`

D. `public void addStrings(List<? extends String> list) {`

Answer: B,C

Question: 50

Given a class whose instances, when found in a collection of objects, are sorted by using the `compareTo()` method, which two statements are true? (Choose two.)

A. The class implements `java.lang.Comparable`.

B. The class implements `java.util.Comparator`.

C. The interface used to implement sorting allows this class to define only one sort sequence.

D. The interface used to implement sorting allows this class to define many different sort sequences.

Answer: A,C

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