Abstract classes, Interfaces and Wrapper classes Workbook

Answer the Following

1. An abstract class_____
2. An abstract method_____
3. An abstract class can contain_____
4. How many interfaces can a class implement?_____
5. The methods of interface are_____by default.
6. An interface can be declared using_____keyword.
7. To implement an interface_____keyword is used.
8. The variables of interfaces are_____by default
9. Which keyword is used to define an abstract class?_____
10. What is autoboxing?

11. What are the different methods to parse Strings in java? _____

State whether the following are True/False

1. A class that implements an interface must implement all the methods declared in the interface. [ ]
2. An abstract class can only contain abstract methods. [ ]
3. Interfaces are defined using the reserved word `interface` and the reserved word `class`.[ ]
4. Using the mechanism of inheritance, every public member of the class Object can be overridden and/or invoked by every object of any class type.[ ]

5. You can instantiate an object of a subclass of an abstract class, but only if the subclass gives the definitions of all the abstract methods of the superclass. [ ]
6. An abstract method is a method that has only the heading with no body. [ ]
7. An interface is a class that contains only abstract methods and/or named constants. [ ]
8. A class can extend only one class and can implements more than one interface. [ ]

Multiple Choice Questions

1. Which of the following declares an abstract method in an abstract Java class?
   (a) public abstract method();
   (b) public abstract void method();
   (c) public void abstract Method();
   (d) public void method()
   (e) public abstract void method()
2. Which of the following statements regarding abstract methods are true?
   (a) An abstract class can have instances created using the constructor of the abstract class.
   (b) An abstract class can be extended.
   (c) A subclass of a non-abstract superclass can be abstract.
   (d) A subclass can override a concrete method in a superclass to declare it abstract.
   (e) An abstract class can be used as a data type
3. Suppose A is an abstract class, B is a concrete subclass of A, and both A and B have a default constructor. Which of the following is correct?
   (a) A a = new A();
   (b) A a = new B();
   (c) B b = new A();
   (d) B b = new B();
4. Which of the following is a correct interface?

(a) interface A void print() ;

(b) abstract interface A print();

(c) abstract interface A abstract void print() ;

(d) interface A void print();

5. Which of these packages contains abstract keyword?

   (a) java.lang

   (b) java.util

   (c) java.io

   (d) java.system

6. Which of these access specifiers can be used for an interface?

   (a) public

   (b) protected

   (c) private

   (d) All of the mentioned

7. Which of these keywords is used by a class to use an interface defined previously?

   (a) import

   (b) Import

   (c) implements

   (d) Implements

8. When class is declared as abstract, then

   (a) Its object can not be created

   (b) Its subclass can not be created

   (c) It can not inherit any class

   (d) It can not have method

9. A class can implements

   (a) only one

   (b) one or more than one

   (c) maximum two

   (d) minimum two

10. A method implementation of an interface must be declared as

(a) private

(b) default access

(c) public

(d) protected

11. An interface contains

    (a) The method definitions

    (b) The method declaration

    (c) Method declaration and definition

    (d) none of these

12. A class implements an interface but does not override all the methods of interface then

    (a) It should be declared as abstract class

    (b) It should be declared as final class

    (c) It must override all the methods of interface

    (d) none of these

13. When class is declared as abstract, then

    (a) Its object can not be created

    (b) Its subclass can not be created

    (c) can not inherit any class

    (d) It can not have methods

14. Which of these is a super class of wrappers Long, Character and Integer?

    (a) Long

    (b) digits

    (c) Float

    (d) Number

15. Which of the following is method of wrapper Integer for converting the value of an object into byte?

    (a) bytevalue()

    (b) byte bytevalue()

    (c) Bytevalue()

    (d) Byte Bytevalue().

16. What is the function of the parseInt() method?

    (a) Parses a datatype and stores in an integer

    (b) Parses a string and returns an integer

    (c) Parses an integer and returns a string

    (d) none

Exercises

- Write the expected output, or compiler errors if any, for each of the following programs in the box provided below each program.
- Then execute the programs and check your answers.
- Then answer the questions given below.

Program 1

```
1  abstract interface Bendable {
2      final int x = 2009;
3      void method1() ;
4      public static class Angle {
5
6      }
7  }
```

Q1: Is the above declaration for interface Bendable correct and free of compilation error?

Program 2

```
1  abstract class AirPlane {
2      abstract void fly();
3      void land() {
4          System.out.print(``Landing..'');
5      }
6  }
7  class AirJet extends AirPlane {
8      AirJet() {
9          super();
10     }
```

```
11      void fly() {
12          System.out.print(``Flying..'');
13      }
14      abstract void land() ;
15  }
```

Q1: The above code contains a compilation error , what can be done to fix this error - independently?

Program 3

```
1  public abstract interface Bouncable {
2      int num1 = 0;
3      public int num2 = 1;
4      public static int num3 = 2;
5      public static transient int num4 = 3;
6      public final int num5 = 3;
7      public static final int num6 = 3;
8  }
```

Q1: Which of the variables is incorrectly declared?

Program 4

```
1  interface Movable {
2      public abstract void m1();
3      void m2();
4      public void m3();
5      abstract void m4();
6  }
7  class Chair implements Movable {
8      public void m1() {
9
10     }
11     void m2() {
12
13     }
14 }
```

Q1: To resolve the compilation error(s) in the above code, what can be done independently?

Program 5

```
1  abstract class AirPlane {
2      abstract void fly();
3      void land() {
4          System.out.print(``Landing'');
5      }
6  }
7  class AirJet extends AirPlane {
8      AirJet() {
9          super();
10     }
11     void fly() {
12         System.out.print(``Flying'');
13     }
14 }
```

Q1: Will the above code compile correctly?

Program 6

```
1  interface Count {
2      short counter = 0;
3      void countUp();
4  }
5  public class TestCount implements Count {
6      public static void main(String [] args) {
7          TestCount t = new TestCount();
8          t.countUp();
9      }
10     public void countUp() {
11         for (int x = 6; x > counter; x--, ++counter) {
12             System.out.print(`` '' + counter);
13         }
14     }
```

```
15 }
```

Q1: What will be the output of the above program?

Program 7

```
1  abstract class A {
2      int num1;
3      abstract void display();
4  }
5  class B extends A {
6      int num2;
7      void display() {
8      System.out.println(num2);
9      }
10 }
11 class Abstract_demo {
12     public static void main(String args[]) {
13         B obj = new B();
14         obj.num2 = 2;
15         obj.display();
16     }
17 }
```

Q1: What will be the output of the above program?

Program 8

```
1  public class Tester {
2      public static void main(String[] args) {
3          Number x = 12; // Line 5
4          Number y = (Long) x; // Line 6
5          System.out.print(x+'' ''+y); // Line 7
6      }
7  }
```

Q1: Given that Long and Integer extend Number, what is the result of compiling and running the code?