10.1 What is the return type of the hashCode() method in the Object class?
Select the one correct answer.
(a) String
(b) int
(c) long
(d) Object
(e) Class

10.2 Which statement is true?
Select the one correct answer.
(a) If the references x and y denote two different objects, the expression x.equals(y) is always false.
(b) If the references x and y denote two different objects, the expression (x.hashCode() == y.hashCode()) is always false.
(c) The hashCode() method in the Object class is declared final.
(d) The equals() method in the Object class is declared final.
(e) All arrays have a method named clone.

10.3 Which exception can the clone() method of the Object class throw?
Select the one correct answer.
(a) CloneNotSupportedException
(b) NotCloneableException
(c) IllegalCloneException
(d) NoClonesAllowedException

10.4 Which of the following are wrapper classes?
Select the three correct answers.
(a) java.lang.Void
(b) java.lang.Int
(c) java.lang.Boolean
(d) java.lang.Long
(e) java.lang.String

10.5 Which of the following classes do not extend the java.lang.Number class?
Select the two correct answers.
(a) java.lang.Float
(b) java.lang.Byte
(c) java.lang.Character
(d) java.lang.Boolean
(e) java.lang.Short

10.6 Which of these classes define immutable objects?
Select the three correct answers.
(a) Character
(b) Byte
(c) Number
(d) Short
(e) Object

10.7 Which of these classes have a one-parameter constructor taking a string?
Select the two correct answers.
(a) Void
(b) Integer
(c) Boolean
(d) Character
(e) Object

10.8 Which of the wrapper classes have a booleanValue() method?
Select the one correct answer.
(a) All wrapper classes.
(b) All wrapper classes except Void.
(c) All wrapper classes that also implement the compareTo() method.
(d) All wrapper classes extending Number.
(e) Only the class Boolean.

10.9 Which statements are true about wrapper classes?
Select the two correct answers.
(a) String is a wrapper class.
(b) Double has a compareTo() method.
(c) Character has a intValue() method.
(d) Byte extends Number.

10.10 What will the program print when compiled and run?
```
public class RQ200_60 {
  public static void main(String[] args) {
    Integer i = -10;
    Integer j = -10;
    System.out.print(i==j);
    System.out.print(i.equals(j));
    Integer n = 128;
    Integer m = 128;
    System.out.print(n==m);
    System.out.print(n.equals(m));
  }
}
```
Select the one correct answer.
(a) falsetruefalsetrue
(b) truetruetruetrue
(c) falsetruetruetrue
(d) truetruefalsetrue
(e) None of the above.

10.11 What will the program print when compiled and run?
```
public class RQ200_70 {
  public static void main(String[] args) {
    Integer i = new Integer(-10);
    Integer j = new Integer(-10);
    Integer k = -10;
    System.out.print(i==j);
    System.out.print(i.equals(j));
    System.out.print(i==k);
    System.out.print(i.equals(k));
  }
}
```
Select the one correct answer.
(a) falsetruefalsetrue
(b) truetruetruetrue
(c) falsetruetruetrue
(d) truetruefalsetrue
(e) None of the above.

10.12 Which of the following operators cannot have an operand of type String?
Select the two correct answers.
(a) +   (b) -   (c) +=   (d) .   (e) &

10.13 Which expression will extract the substring "kap", given the following declaration:
String str = "kakapo";
Select the one correct answer.
(a) str.substring(2, 2)
(b) str.substring(2, 3)
(c) str.substring(2, 4)
(d) str.substring(2, 5)
(e) str.substring(3, 3)

10.14 What will be the result of attempting to compile and run the following code?
```
class MyClass {
  public static void main(String[] args) {
    String str1 = "str1";
    String str2 = "str2";
    String str3 = "str3";
    str1.concat(str2);
    System.out.println(str3.concat(str1));
  }
}
```
Select the one correct answer.
(a) The code will fail to compile because the expression str3.concat(str1) will not result in a valid argument for the println() method.
(b) The program will print str3str1str2, when run.
(c) The program will print str3, when run.
(d) The program will print str3str1, when run.
(e) The program will print str3str2, when run.

10.15 Which statement about the trim() method of the String class is true?
Select the one correct answer.
(a) It returns a string where the leading white space of the original string has been removed.
(b) It returns a string where the trailing white space of the original string has been removed.
(c) It returns a string where both the leading and trailing white space of the original string has been removed.
(d) It returns a string where all the white space of the original string has been removed.
(e) None of the above.

10.16 Which statements are true?
Select the two correct answers.
(a) String objects are immutable.
(b) Subclasses of the String class can be mutable.
(c) All wrapper classes are declared final.
(d) All objects have a public method named clone.
(e) The expression ((new StringBuilder()) instanceof String) is always true.

10.17 Which of these expressions are legal?
Select the four correct answers.
```
(a) "co".concat("ol")
(b) ("co" + "ol")
(c) ('c' + 'o' + 'o' + 'l')
(d) ("co" + new String('o' + 'l'))
(e) ("co" + new String("co"))
```

10.18 What will be the result of attempting to compile and run the following program?
```
public class RefEq {
  public static void main(String[] args) {
    String s = "ab" + "12";
    String t = "ab" + 12;
    String u = new String("ab12");
    System.out.println((s==t) + " " + (s==u));
  }
}
```
Select the one correct answer.
(a) The program will fail to compile.
(b) The program will print false false, when run.
(c) The program will print false true, when run.
(d) The program will print true false, when run.
(e) The program will print true true, when run.

10.19 Which of these parameter lists can be found in a constructor of the String class?
Select the three correct answers.
(a) ()
(b) (int capacity)
(c) (char[] data)
(d) (String str)

10.20 Which method is not defined in the String class?
Select the one correct answer.
(a) trim()
(b) length()
(c) concat(String)
(d) hashCode()
(e) reverse()

10.21 Which statement about the charAt() method of the String class is true?
Select the one correct answer.
(a) The charAt() method takes a char value as an argument.
(b) The charAt() method returns a Character object.
(c) The expression ("abcdef").charAt(3) is illegal.
(d) The expression "abcdef".charAt(3) evaluates to the character 'd'.
(e) The index of the first character is 1.

10.22 Which expression will evaluate to true?
Select the one correct answer.
```
(a) "hello: there!".equals("hello there")
(b) "HELLO THERE".equals("hello there")
(c) ("hello".concat("there")).equals("hello there")
(d) "Hello There".compareTo("hello there") == 0
(e) "Hello there".toLowerCase().equals("hello there")
```

10.23 What will the following program print when run?
```
public class Search {
  public static void main(String[] args) {
    String s = "Contentment!";
    int middle = s.length()/2;
    String nt = s.substring(middle-1, middle+1);
    System.out.println(s.lastIndexOf(nt, middle));
  }
}
```
Select the one correct answer.
(a) 2
(b) 4
(c) 5
(d) 7
(e) 9
(f) 11

10.24 What will the following program print when run?
```java
public class Uppity {
   public static void main(String[] args) {
      String str1 = "lower", str2 = "LOWER", str3 = "UPPER";
      str1.toUpperCase();
      str1.replace("LOWER","UPPER");
      System.out.println((str1.equals(str2)) + " " + (str1.equals(str3)));
   }
}
```
Select the one correct answer.
(a) The program will print false true.
(b) The program will print false false.
(c) The program will print true false.
(d) The program will print true true.
(e) The program will fail to compile.
(f) The program will compile, but throw an exception at runtime.

10.25 What will the following program print when run?
```java
public class FunCharSeq {
   private static void putO(String s1) {
      s1 = s1.trim();
      s1 += "O";
   }
   public static void main(String[] args) {
      String s1 = " W ";
      putO(s1);
      s1.concat("W");
      System.out.println("|" + s1 + "|");
   }
}
```
Select the one correct answer.
(a) |WOW| (b) | WW | (c) | WO | (d) | W |
(e) The program will fail to compile.
(f) The program will compile, but throw an exception at runtime.

10.26 What will be the result of attempting to compile and run the following program?
```java
public class MyClass {
   public static void main(String[] args) {
      String s = "hello";
      StringBuilder sb = new StringBuilder(s);
      sb.reverse();
      if (s == sb) System.out.println("a");
      if (s.equals(sb)) System.out.println("b");
      if (sb.equals(s)) System.out.println("c");
   }
}
```
Select the one correct answer.
(a) The code will fail to compile because the constructor of the String class is not called properly.
(b) The code will fail to compile because the expression (s == sb) is illegal.
(c) The code will fail to compile because the expression (s.equals(sb)) is illegal.
(d) The program will print c, when run.
(e) The program will throw a ClassCastException, when run.

10.27 What will be the result of attempting to compile and run the following program?
```java
public class MyClass {
   public static void main(String[] args) {
      StringBuilder sb = new StringBuilder("have a nice day");
      sb.setLength(6);
      System.out.println(sb);
   }
}
```

Select the one correct answer.
(a) The code will fail to compile because there is no method named setLength in the StringBuilder class.
(b) The code will fail to compile because the StringBuilder reference sb is not a legal argument to the println() method.
(c) The program will throw a StringIndexOutOfBoundsException, when run.
(d) The program will print have a nice day , when run.
(e) The program will print have a, when run.
(f) The program will print ce day , when run.

10.28 Which of these parameter lists can be found in a constructor of the StringBuilder class?
Select the three correct answers.
(a) ()
(b) (int capacity)
(c) (char[] data)
(d) (String str)

10.29 Which method is not defined in the StringBuilder class?
Select the one correct answer.
(a) trim()
(b) length()
(c) append(String)
(d) reverse()
(e) setLength(int)

10.30 What will be the result of attempting to compile and run the following program?
```java
public class StringMethods {
   public static void main(String[] args) {
      String str = new String("eeny");
      str.concat(" meeny");
      StringBuilder strBuilder = new StringBuilder(" miny");
      strBuilder.append(" mo");
      System.out.println(str + strBuilder);
   }
}
```
Select the one correct answer.
(a) The program will fail to compile.
(b) The program will print eeny meeny miny mo, when run.
(c) The program will print meeny miny mo, when run.
(d) The program will print eeny miny mo, when run.
(e) The program will print eeny meeny miny , when run.

10.31 What will the following program print when run?
```java
public class PeskyCharSeq {
   public static void main (String[] args) {
      StringBuilder sb1 = new StringBuilder("WOW");
      StringBuilder sb2 = new StringBuilder(sb1);
      System.out.println((sb1==sb2) + " " + sb1.equals(sb2));
   }
}
```
Select the one correct answer.
(a) The program will print false true.
(b) The program will print false false.
(c) The program will print true false.
(d) The program will print true true.
(e) The program will fail to compile.
(f) The program will compile, but throws an exception at runtime.

10.32 What will the following program print when run?

```
public class MoreCharSeq {
  public static void main (String[] args) {
    String s1 = "WOW";
    StringBuilder s2 = new StringBuilder(s1);
    String s3 = new String(s2);
    System.out.println((s1.hashCode() == s2.hashCode()) + " " +
        (s1.hashCode() == s3.hashCode()));
  }
}
```

Select the one correct answer.
(a) The program will print false true.
(b) The program will print false false.
(c) The program will print true false.
(d) The program will print true true.
(e) The program will fail to compile.
(f) The program will compile, but throw an exception at runtime.

10.33 What will the following program print when run?

```
public class CharSeq {
  public static void main (String[] args) {
    String cs1 = "JAVA";
    StringBuilder cs2 = new StringBuilder(cs1);
    System.out.println(cs1.compareTo(cs2) == cs2.compareTo(cs1));
  }
}
```

Select the one correct answer.
(a) The program will print false.
(b) The program will print true.
(c) The program will fail to compile.
(d) The program will compile, but throw an exception at runtime.

10.34 What will the following program print when run?

```
public class Appendage {
  private static void putO(StringBuilder s1) {
    s1 = s1.append("O");
  }
  public static void main(String[] args) {
    StringBuilder s1 = new StringBuilder("W");
    putO(s1);
    s1.append("W!");
    System.out.println(s1);
  }
}
```

Select the one correct answer.
(a) The program will print WW!.
(b) The program will print WOW!.
(c) The program will print W.
(d) The program will fail to compile.
(e) The program will compile, but throw an exception at runtime.

10.35 What will the following program print when run?

```
public class Chains {
  private static StringBuilder putO(StringBuilder s1) {
    s1.append("O");
    return s1;
  }
  public static void main(String[] args) {
    StringBuilder s1 = new StringBuilder("W");
    boolean status = putO(s1).append("W!").toString().compareTo("WOW!") != 0;
    System.out.println(s1 + " " + status);
  }
}
```

Select the one correct answer.
(a) The program will print WOW! false.
(b) The program will print WOW! true.
(c) The program will print WW! true.
(d) The program will fail to compile.
(e) The program will compile, but throw an exception at runtime.