11.1 Which of these can act both as the source of an input stream and as the destination of an output stream, based on the classes provided by the java.io package?
Select the four correct answers.
(a) A file
(b) A network connection
(c) A pipe
(d) A string
(e) An array of chars

11.2 Which of these statements about the constant named separator of the File class are true?
Select the two correct answers.
(a) The variable is of type char.
(b) The variable is of type String.
(c) It can be assumed that the value of the variable always is the character '/'.
(d) It can be assumed that the value of the variable always is one of '/', '\' or ':'.
(e) The separator can consist of more than one character.

11.3 Which one of these methods in the File class will return the name of the entry, excluding the specification of the directory in which it resides?
Select the one correct answer.
(a) getAbsolutePath()
(b) getName()
(c) getParent()
(d) getPath()
(e) None of the above.

11.4 What will the method length() in the class File return?
Select the one correct answer.
(a) The number of characters in the file.
(b) The number of kilobytes in the file.
(c) The number of lines in the file.
(d) The number of words in the file.
(e) None of the above.

11.5 Given the following program:
```
import java.io.File;
import java.io.IOException;
public final class Filing {
  public static void main (String[] args) throws IOException {
    File file = new File("./documents","../book/../chapter1");
    System.out.println(file.getPath());
    System.out.println(file.getAbsolutePath());
    System.out.println(file.getCanonicalPath());
    System.out.println(file.getName());
    System.out.println(file.getParent());
  }
}
```
Assume that the current or working directory has the absolute path "/wrk". Which lines below will not be included in the output from the program?
Select the two correct answers.
(a) ./documents/../book/../chapter1
(b) ./documents/book/chapter1
(c) /wrk/./documents/../book/../chapter1
(d) /wrk/documents/book/chapter1
(e) /wrk/chapter1
(f) chapter1
(g) ./documents/../book/..

11.6 Given the following program:
```
import java.io.File;
public class ListingFiles {
  public static void main(String[] args) {
    File currentDirectory = new File(".");
    printFiles1(currentDirectory);
    printFiles2(currentDirectory);
    printFiles3(currentDirectory);
  }
  public static void printFiles1(File currentDirectory) {
    String[] entryNames = currentDirectory.list();
    for (String entryName : entryNames) {
      System.out.println(entryName);
    }
  }
  public static void printFiles2(File currentDirectory) {
    File[] entries = currentDirectory.listFiles();
    for (File entry : entries) {
System.out.println(entry);
    }
  }
  public static void printFiles3(File currentDirectory) {
    File[] entries = currentDirectory.listFiles();
    for (File entry : entries) {
      System.out.println(entry.getPath());
    }
  }
}
```
Assume that the current or working directory has the absolute path "/wrk" and contains only one file with the name "ListingFiles.class".
Which statement is true about the program?
Select the one correct answer.
(a) All three methods printFiles1(), printFiles2(), and printFiles3() will produce the same output.
(b) Only the methods printFiles1() and printFiles2(), will produce the same output.
(c) Only the methods printFiles2() and printFiles3(), will produce the same output.
(d) Only the methods printFiles1() and printFiles3(), will produce the same output.
(e) The program does not compile because the list() method does not exist in the File class.

11.7 A file is readable but not writable on the file system of the host platform. What will be the result of calling the method canWrite() on a File object representing this file?
Select the one correct answer.
(a) A SecurityException is thrown.
(b) The boolean value false is returned.
(c) The boolean value true is returned.
(d) The file is modified from being unwritable to being writable.
(e) None of the above.

11.8 What is the type of the parameter given to the method renameTo() in the class File?
Select the one correct answer.
(a) File
(b) FileDescriptor
(c) FileNameFilter
(d) String
(e) char[]

11.9 If write(0x01234567) is called on an instance of OutputStream, what will be written to the destination of the stream?
Select the one correct answer.
(a) The bytes 0x01, 0x23, 0x34, 0x45, and 0x67, in that order.
(b) The bytes 0x67, 0x45, 0x34, 0x23, and 0x01, in that order.
(c) The byte 0x01.
(d) The byte 0x67.
(e) None of the above.

11.10 Given the following code, under which circumstances will the method return false?
```
public static boolean test(InputStream is) throws IOException {
  int value = is.read();
  return value >= 0;
}
```
Select the one correct answer.
(a) A character of more than 8 bits was read from the input stream.
(b) An I/O error occurred.
(c) Never.
(d) The end of the stream was reached in the input stream.

11.11 Which of these classes provides methods for writing binary representations of Java primitive values?
Select the two correct answers.
(a) DataOutputStream
(b) FileOutputStream
(c) ObjectOutputStream
(d) PrintStream
(e) BufferedOutputStream

11.12 Given the following program:
```
import java.io.DataInputStream;
import java.io.EOFException;
import java.io.FileInputStream;
import java.io.FileNotFoundException;
import java.io.IOException;
public class Endings {
  public static void main(String[] args) {
    try {
      FileInputStream fos = new FileInputStream("info.dat");
      DataInputStream dis = new DataInputStream(fos);
      int i = dis.readByte();
      while (i != -1) {
        System.out.print((byte)i + "|");
        i = dis.readByte();
      }
    } catch (FileNotFoundException fnf) {
      System.out.println("File not found");
    } catch (EOFException eofe) {
      System.out.println("End of stream");
    } catch (IOException ioe) {
      System.out.println("Input error");
    }
  }
}
```
Assume that the file "info.dat" exits in the current directory and has only the byte values 10, 20 and 30, stored in that order.
Which statement is true about the program?

Select the one correct answer.
(a) The program will not compile because a certain unchecked exception is not caught.
(b) The program will compile and print 10|20|30|Input error.
(c) The program will compile and print 10|20|30|End of stream.
(d) The program will compile and print 10|20|30|, and then block in order to read from the file.
(e) The program will compile and print 10|20|30|, and terminate because of an uncaught exception.

11.13 Which of these are valid parameter types for the write() methods of the Writer class?
Select the three correct answers.
(a) String   (b) char   (c) char[]   (d) int

11.14 What is the default encoding for an OutputStreamWriter?
Select the one correct answer.
(a) 8859_1   (b) UTF8   (c) Unicode   (d) The default is system-dependent.
          (e) The default is not system-dependent, but is none of the above.

11.15 Which of these integer types do not have their own print() method in the PrintWriter class?
Select the one correct answer.
(a) byte   (b) char   (c) int   (d) long
          (e) All have their own print() method.

11.16 How can one access the standard error stream?
Select the one correct answer.
(a) It is accessed via a member of the System.err class.
(b) It is accessed via the static variable named out in the System class.
(c) It is accessed via the static variable named err in the System class.
(d) It is accessed via the static variable named err in the Runtime class.
(e) It is returned by a method in the System class.

11.17 How can we programmatically guarantee that a call to a print() method of the PrintWriter class was successful or not?
Select the one correct answer.
(a) Check if the return value from the call is -1.
(b) Check if the return value from the call is null.
(c) Catch the IOException that is thrown when an I/O error occurs.
(d) Call the checkError() method of the PrinterWriter class immediately after the print() method call returns to see if an IOException was thrown.

11.18 Given the following program:
```
import java.io.EOFException;
import java.io.FileInputStream;
import java.io.FileNotFoundException;
import java.io.IOException;
import java.io.InputStreamReader;
public class MoreEndings {
  public static void main(String[] args) {
    try {
      FileInputStream fis = new FileInputStream("seq.txt");
      InputStreamReader isr = new InputStreamReader(fis);
      int i = isr.read();
      while (i != -1) {
        System.out.print((char)i + "|");
        i = isr.read();
      }
    } catch (FileNotFoundException fnf) {
      System.out.println("File not found");
    } catch (EOFException eofe) {
      System.out.println("End of stream");
    } catch (IOException ioe) {
      System.out.println("Input error");
    }
  }
}
```

Assume that the file "seq.txt" exists in the current directory, has the required access permissions, and contains the string "Hello".

Which statement about the program is true?

Select the one correct answer.

(a) The program will not compile because a certain unchecked exception is not caught.

(b) The program will compile and print H|e|l|l|o|Input error.

(c) The program will compile and print H|e|l|l|o|End of stream.

(d) The program will compile, print H|e|l|l|o|, and then terminate normally.

(e) The program will compile, print H|e|l|l|o|, and then block in order to read from the file.

(f) The program will compile, print H|e|l|l|o|, and terminate because of an uncaught exception.

11.19 Which code, when inserted at (1), will result in the program compiling and running without errors?

```
import java.io.*;
public class MakeLines {
  public static void main(String[] args) {
    try {
      String fileName = "greetings.txt";
      // (1) INSERT CODE HERE ...
      writeGreetings(stream);
      stream.close();
    } catch (IOException ioe) {
      System.out.println("I/O error");
    }
  }
  private static void writeGreetings(Writer writer) {
    try {
      BufferedWriter bw = new BufferedWriter(writer);
      bw.write("Hello");
      bw.newLine();
      bw.write("Howdy");
      bw.newLine();
      bw.flush();
    } catch (IOException ioe) {
      System.out.println("I/O error");
    }
  }
}
```

Select the three correct answers.

(a) FileOutputStream fos = new FileOutputStream(fileName);

(b) OutputStreamWriter stream = new OutputStreamWriter(fos);

(c) FileOutputStream fos = new FileOutputStream(fileName);

(d) InputStreamWriter stream = new InputStreamWriter(fos);

(e) FileOutputStream stream = new FileOutputStream(fileName);

(f) PrintWriter stream = new PrintWriter(fileName);

(g) FileWriter stream = new FileWriter(fileName);

11.20 Given the following program:

```
import java.io.BufferedReader;
import java.io.EOFException;
import java.io.FileNotFoundException;
import java.io.FileReader;
import java.io.IOException;
public class NoEndings {
  public static void main(String[] args) {
    try {
      FileReader fr = new FileReader("greetings.txt");
      BufferedReader br = new BufferedReader(fr);
      System.out.print(br.readLine() + "|");
      System.out.print(br.readLine() + "|");
      System.out.print(br.readLine() + "|");
    } catch (EOFException eofe) {
      System.out.println("End of stream");
    } catch (IOException ioe) {
      System.out.println("Input error");
    }
  }
}
```

Assume that the file "greeting.txt" exists in the current directory, has the required access permissions, and contains the following two lines of text:

Hello

Howdy

Which statement is true about the program?

Select the one correct answer.

(a) The program will not compile because the FileNotFoundException is not caught.

(b) The program will compile, print Hello|Howdy|null|, and then terminate normally.

(c) The program will compile and print Hello|Howdy|Input error.

(d) The program will compile and print Hello|Howdy|End of stream.

(e) The program will compile, print Hello|Howdy|, and then block in order to read from the file.

(f) The program will compile, print Hello|Howdy|, and terminate because of an uncaught exception.

11.21 Given the following program:

```
import java.io.Console;
public class ConsoleInput {
  public static void main(String[] args){
    Console console = System.console();
    if (console == null) {
      System.err.println("No console available.");
      return;
    }
    String username = console.readLine("Enter user name (%d chars): ", 4);
    char[] password = console.readPassword("Enter password (%d chars): ", 4);
    System.out.println("Username: " + username);
    System.out.println("Password: " + String.valueOf(password));
  }
}
```

Assume that the user types the strings "java dude" and "fort knox" when prompted for the user name and the password, respectively.

Which statement about the program is true?

Select the one correct answer.

(a) The program will print:
```
Username: java
Password: fort knox
```
(b) The program will print:
```
Username: java dude
Password: fort
```
(c) The program will print:
```
Username: java dude
Password: fort knox
```
(d) The program will print:
```
Username: java
Password: fort
```

11.22 How many methods are defined in the Serializable interface?

Select the one correct answer.

(a) None   (b) One   (c) Two   (d) Three   (e) None of the above.

11.23 Which of the following best describes the data written by an ObjectOutputStream?

Select the one correct answer.

(a) Bytes and other Java primitive types.
(b) Object hierarchies.
(c) Object hierarchies and Java primitive types.
(d) Single objects.
(e) Single objects and Java primitive types.

11.24 Given the following code:

```java
public class Person  {
  protected String name;
  Person() { }
  Person(String name) { this.name = name; }
}
_____
import java.io.Serializable;
public class Student extends Person implements Serializable {
  private long studNum;
  Student(String name, long studNum) {
    super(name);
    this.studNum = studNum;
  }
  public String toString() { return "(" + name + ", " + studNum + ")"; }
}
_____
import java.io.*;
public class RQ800_10 {
  public static void main(String args[])
    throws IOException, ClassNotFoundException {
    FileOutputStream outputFile = new FileOutputStream("storage.dat");
    ObjectOutputStream outputStream = new ObjectOutputStream(outputFile);
    Student stud1 = new Student("Aesop", 100);
    System.out.print(stud1);
    outputStream.writeObject(stud1);
    outputStream.flush();
    outputStream.close();
    FileInputStream inputFile = new FileInputStream("storage.dat");
    ObjectInputStream inputStream = new ObjectInputStream(inputFile);
    Student stud2 = (Student) inputStream.readObject();
    System.out.println(stud2);
    inputStream.close();
  }
}
```

Which statement about the program is true?

Select the one correct answer.

(a) It fails to compile.
(b) It compiles, but throws an exception at runtime.
(c) It prints (Aesop, 100)(Aesop, 100).
(d) It prints (Aesop, 100)(null, 100).
(e) It prints (Aesop, 100)(, 100).

11.25 Given the following code:

```java
public class Person  {
  protected String name;
  Person() { this.name = "NoName"; }
  Person(String name) { this.name = name; }
}
_____
import java.io.Serializable;
public class Student extends Person implements Serializable {
  private long studNum;
  Student(String name, long studNum) {
    super(name);
    this.studNum = studNum;
  }
  public String toString() { return "(" + name + ", " + studNum + ")"; }
}
_____
import java.io.*;
public class RQ800_20 {
  public static void main(String args[])
    throws IOException, ClassNotFoundException {
    FileOutputStream outputFile = new FileOutputStream("storage.dat");
    ObjectOutputStream outputStream = new ObjectOutputStream(outputFile);
    Student stud1 = new Student("Aesop", 100);
    System.out.print(stud1);
    outputStream.writeObject(stud1);
    outputStream.flush();
    outputStream.close();
    FileInputStream inputFile = new FileInputStream("storage.dat");
    ObjectInputStream inputStream = new ObjectInputStream(inputFile);
    Student stud2 = (Student) inputStream.readObject();
    System.out.println(stud2);
    inputStream.close();
  }
}
```

Which statement about the program is true?

Select the one correct answer.

(a) It fails to compile.
(b) It compiles, but throws an exception at runtime.
(c) It prints (Aesop, 100)(Aesop, 100).
(d) It prints (Aesop, 100)(null, 100).
(e) It prints (Aesop, 100)(NoName, 100).

11.26 Given the following code:

```java
import java.io.Serializable;
public class Person implements Serializable {
  protected String name;
  Person() { this.name = "NoName"; }
  Person(String name) { this.name = name; }
}
_____
public class Student extends Person {
  private long studNum;
  Student(String name, long studNum) {
    super(name);
    this.studNum = studNum;
  }
  public String toString() { return "(" + name + ", " + studNum + ")"; }
}
_____
import java.io.*;
public class RQ800_30 {
  public static void main(String args[])
    throws IOException, ClassNotFoundException {
    FileOutputStream outputFile = new FileOutputStream("storage.dat");
    ObjectOutputStream outputStream = new ObjectOutputStream(outputFile);
    Student stud1 = new Student("Aesop", 100);
    System.out.print(stud1);
    outputStream.writeObject(stud1);
    outputStream.flush();
    outputStream.close();
    FileInputStream inputFile = new FileInputStream("storage.dat");
    ObjectInputStream inputStream = new ObjectInputStream(inputFile);
    Student stud2 = (Student) inputStream.readObject();
    System.out.println(stud2);
    inputStream.close();
  }
}
```

Which statement about the program is true?

Select the one correct answer.

(a) It fails to compile.

(b) It compiles, but throws an exception at runtime.

(c) It prints (Aesop, 100)(Aesop, 100).

(d) It prints (Aesop, 100)(null, 100).

(e) It prints (Aesop, 100)(NoName, 100).

11.27 Given the following code:

```java
import java.io.Serializable;
public class Person implements Serializable {
  protected transient String name;
  Person(String name) { this.name = name; }
}
_____
public class Student extends Person {
  private long studNum;
  Student(String name, long studNum) {
    super(name);
    this.studNum = studNum;
  }
  public String toString() { return "(" + name + ", " + studNum + ")"; }
}
_____
```

```java
import java.io.*;
public class RQ800_40 {
  public static void main(String args[])
    throws IOException, ClassNotFoundException {
    FileOutputStream outputFile = new FileOutputStream("storage.dat");
    ObjectOutputStream outputStream = new ObjectOutputStream(outputFile);
    Student stud1 = new Student("Aesop", 100);
    System.out.print(stud1);
    outputStream.writeObject(stud1);
    outputStream.flush();
    outputStream.close();
    FileInputStream inputFile = new FileInputStream("storage.dat");
    ObjectInputStream inputStream = new ObjectInputStream(inputFile);
    Student stud2 = (Student) inputStream.readObject();
    System.out.println(stud2);
    inputStream.close();
  }
}
```

Which statement about the program is true?

Select the one correct answer.

(a) It fails to compile.

(b) It compiles, but throws an exception at runtime.

(c) It prints (Aesop, 100)(Aesop, 100).

(d) It prints (Aesop, 100)(null, 100).

(e) It prints (Aesop, 100)(NoName, 100).

11.28 Given the following code:

```java
import java.io.Serializable;
public class Person implements Serializable {
  protected transient String name;
  Person() { this.name = "NoName"; }
  Person(String name) { this.name = name; }
}
_____
import java.io.*;
public class Student extends Person {
  private long studNum;
  Student(String name, long studNum) {
    super(name);
    this.studNum = studNum;
  }
  public String toString() { return "(" + name + ", " + studNum + ")"; }
  private void writeObject(ObjectOutputStream oos) throws IOException {
oos.defaultWriteObject();
      oos.writeObject("NewName");
  }
  private void readObject(ObjectInputStream ois)
 throws IOException, ClassNotFoundException {
ois.defaultReadObject();
      name = (String) ois.readObject();
  }
}
_____
```

```
import java.io.*;
public class RQ800_50 {
  public static void main(String args[])
    throws IOException, ClassNotFoundException {
    FileOutputStream outputFile = new FileOutputStream("storage.dat");
    ObjectOutputStream outputStream = new ObjectOutputStream(outputFile);
    Student stud1 = new Student("Aesop", 100);
    System.out.print(stud1);
    outputStream.writeObject(stud1);
    outputStream.flush();
    outputStream.close();
    FileInputStream inputFile = new FileInputStream("storage.dat");
    ObjectInputStream inputStream = new ObjectInputStream(inputFile);
    Student stud2 = (Student) inputStream.readObject();
    System.out.println(stud2);
    inputStream.close();
  }
}
```

Which statement about the program is true?

Select the one correct answer.

(a) It fails to compile.

(b) It compiles, but throws an exception at runtime.

(c) It prints (Aesop, 100)(Aesop, 100).

(d) It prints (Aesop, 100)(NewName, 100).

(e) It prints (Aesop, 100)(NoName, 100).

11.29 Given the following code:
```
public class Person {
  protected transient String name;
  Person() { this.name = "NoName"; }
  Person(String name) { this.name = name; }
}
_____
public class Student extends Person {
  protected long studNum;
  Student() { }
  Student(String name, long studNum) {
    super(name);
    this.studNum = studNum;
  }
}
_____
import java.io.*;
public class GraduateStudent extends Student implements Serializable {
  private int year;
  GraduateStudent(String name, long studNum, int year) {
    super(name, studNum);
    this.year = year;
  }
  public String toString() {
    return "(" + name + ", " + studNum + ", " + year  + ")";
  }
  private void readObject(ObjectInputStream ois)
 throws IOException, ClassNotFoundException {
ois.defaultReadObject();
      name = "NewName";
      studNum = 200;
      year =2;
  }
}
```

```
import java.io.*;
public class RQ800_70 {
  public static void main(String args[])
    throws IOException, ClassNotFoundException {
    FileOutputStream outputFile = new FileOutputStream("storage.dat");
    ObjectOutputStream outputStream = new ObjectOutputStream(outputFile);
    GraduateStudent stud1 = new GraduateStudent("Aesop", 100, 1);
    System.out.print(stud1);
    outputStream.writeObject(stud1);
    outputStream.flush();
    outputStream.close();
    FileInputStream inputFile = new FileInputStream("storage.dat");
    ObjectInputStream inputStream = new ObjectInputStream(inputFile);
    GraduateStudent stud2 = (GraduateStudent) inputStream.readObject();
    System.out.println(stud2);
    inputStream.close();
  }
}
```

Which statement about the program is true?

Select the one correct answer.
(a) It fails to compile.
(b) It compiles, but throws an exception at runtime.
(c) It prints (Aesop, 100, 1)(Aesop, 100, 1).
(d) It prints (Aesop, 100, 1)(NewName, 0, 1).
(e) It prints (Aesop, 100, 1)(NewName, 200, 2).

11.30 Given the following code:
```
import java.io.Serializable;
public class Person implements Serializable {
  protected transient String name;
  Person(String name) { this.name = name; }
}
_____
public class Student extends Person {
  private static int numOfStudents;
  private long studNum;
  Student(String name, long studNum) {
    super(name);
    this.studNum = studNum;
    ++numOfStudents;
  }
  public String toString() {
    return "(" + name + ", " + studNum + ", " + numOfStudents + ")";
  }
}
_____
import java.io.*;
public class RQ800_80 {
  public static void main(String args[])
    throws IOException, ClassNotFoundException {
    FileOutputStream outputFile = new FileOutputStream("storage.dat");
    ObjectOutputStream outputStream = new ObjectOutputStream(outputFile);
    Student stud1 = new Student("Aesop", 100);
    System.out.print(stud1);
    outputStream.writeObject(stud1);
    outputStream.flush();
    outputStream.close();
    Student student = new Student("Mowgli", 300);
    FileInputStream inputFile = new FileInputStream("storage.dat");
    ObjectInputStream inputStream = new ObjectInputStream(inputFile);
    Student stud2 = (Student) inputStream.readObject();
    System.out.println(stud2);
    inputStream.close();
  }
}
```

Which statement about the program is true?

Select the one correct answer.
(a) It fails to compile.
(b) It compiles, but throws an exception at runtime.
(c) It prints (Aesop, 100, 1)(Aesop, 100, 1).
(d) It prints (Aesop, 100, 1)(null, 100, 2).
(e) It prints (Aesop, 100, 1)(null, 100, 1).