


Chapter 17 Binary I/O

Section 17.2 How is I/O Handled in Java?

17.1 Which of the following statements are true?


- ☒ A. A File object encapsulates the properties of a file or a path, but does not contain the methods for reading/writing.
- ☐ B. You can use the PrintWriter class for outputting text to a file.
- ☐ C. You can use the Scanner class for reading text from a file.
- ☐ D. An input object is also called an input stream.
- ☐ E. An output object is also called an output stream.

Your answer A is incorrect 
The correct answer is ABCDE

Section 17.3 Text I/O vs. Binary I/O

17.2 Which of the following statements are true?

- ☒ A. Text I/O is built upon binary I/O to provide a level of abstraction for character encoding and decoding.
- ☐ B. Text I/O involves encoding and decoding.
- ☐ C. Binary I/O does not require conversions.
- ☐ D. Binary I/O is more efficient than text I/O, because binary I/O does not require encoding and decoding.
- ☐ E. Binary files are independent of the encoding scheme on the host machine and thus are portable.

Your answer A is incorrect 
The correct answer is ABCDE

Section 17.4 Binary I/O Classes

17.3 Which method can you use to find out the number of the bytes in a file using InputStream?

- ☒ A. length()
- ☐ B. available()
- ☐ C. size()
- ☐ D. getSize()

Your answer A is incorrect
The correct answer is B



17.4 Which of the following statements are true?

- ☒ A. All methods in `FileInputStream/FileOutputStream` are inherited from `InputStream/OutputStream`.
- ☐ B. You can create a `FileInputStream/FileOutputStream` from a `File` object or a file name using `FileInputStream/FileOutputStream` constructors.
- ☐ C. The return value `-1` from the `read()` method signifies the end of file.
- ☐ D. A `java.io.FileNotFoundException` would occur if you attempt to create a `FileInputStream` with a nonexistent file.
- ☐ E. A `java.io.FileNotFoundException` would occur if you attempt to create a `FileOutputStream` with a nonexistent file.

Your answer A is incorrect
The correct answer is ABCD



17.5 To append data to an existing file, use _____ to construct a `FileOutputStream` for file `out.dat`.

- ☒ A. `new FileOutputStream("out.dat")`
- ☐ B. `new FileOutputStream("out.dat", false)`
- ☐ C. `new FileOutputStream("out.dat", true)`
- ☐ D. `new FileOutputStream(true, "out.dat")`

Your answer A is incorrect
The correct answer is C




17.6 What does the following code do?

```
FileInputStream fis = new FileInputStream("test.dat");
```


- ☒ A. It creates a new file named `test.dat` if it does not exist and opens the file so you can write to it.
- ☐ B. It creates a new file named `test.dat` if it does not exist and opens the file so you can write to it and read from it.
- ☐ C. It creates a new file named `test.dat` regardless of whether it exists or not and opens the file so you can write to it.
- ☐ D. It creates a new file named `test.dat` regardless of whether it exists or not and opens the file so you can write to it and read from it.

- ☐ E. It creates a FileInputStream for test.dat if test.dat exists.

Your answer A is incorrect 
The correct answer is E


17.7 Which type of exception occurs when creating a DataInputStream for a nonexistent file?

- ☒ A. FileNotExist
☐ B. FileNotExistException
☐ C. FileNotFound
☐ D. FileNotFoundException

Your answer A is incorrect 
The correct answer is D

17.8 Which of the following statements is correct to create a DataOutputStream to write to a file named out.dat?

- ☒ A. DataOutputStream outfile = new DataOutputStream(new File("out.dat"));
☐ B. DataOutputStream outfile = new DataOutputStream(new FileOutputStream("out.dat"));
☐ C. DataOutputStream outfile = new DataOutputStream(FileOutputStream("out.dat"));
☐ D. DataOutputStream outfile = new DataOutputStream("out.dat");

Your answer A is incorrect 
The correct answer is B

17.9 After the following program is finished, how many bytes are written to the file t.dat?

```
import java.io.*;

public class Test {
    public static void main(String[] args) throws IOException {
        DataOutputStream output = new DataOutputStream(
            new FileOutputStream("t.dat"));
        output.writeShort(1234);
        output.writeShort(5678);
        output.close();
    }
}
```

- ☒ A. 2 bytes.

- ☐ B. 4 bytes.
- ☐ C. 8 bytes.
- ☐ D. 16 bytes.

Your answer A is incorrect



The correct answer is B

Explanation: Each short number takes 2 bytes. So total is 4 bytes.

17.10 After the following program is finished, how many bytes are written to the file t.dat?

```
import java.io.*;

public class Test {
    public static void main(String[] args) throws IOException {
        DataOutputStream output = new DataOutputStream(
            new FileOutputStream("t.dat"));
        output.writeChar('A');
        output.close();
    }
}
```

- ☒ A. 2 bytes.
- ☐ B. 4 bytes.
- ☐ C. 8 bytes.
- ☐ D. none of the above.

Your answer is correct



Explanation: Two bytes of Unicode for 'A' is written

17.11 After the following program is finished, how many bytes are written to the file t.dat?

```
import java.io.*;

public class Test {
    public static void main(String[] args) throws IOException {
        DataOutputStream output = new DataOutputStream(
            new FileOutputStream("t.dat"));
        output.writeChars("ABCD");
        output.close();
    }
}
```

- ☒ A. 2 bytes.
- ☐ B. 4 bytes.

- ☐ C. 8 bytes.
- ☐ D. 12 bytes.
- ☐ E. 16 bytes.

Your answer A is incorrect



The correct answer is C

Explanation: Two bytes of Unicode for each character is written to output.

17.12 After the following program is finished, how many bytes are written to the file t.dat?

```
import java.io.*;

public class Test {
    public static void main(String[] args) throws IOException {
        DataOutputStream output = new DataOutputStream(
            new FileOutputStream("t.dat"));
        output.writeUTFString("ABCD");
        output.close();
    }
}
```

- ☒ A. 2 bytes.
- ☐ B. 4 bytes.
- ☐ C. 6 bytes.
- ☐ D. 8 bytes.
- ☐ E. 10 bytes.

Your answer A is incorrect



The correct answer is C

Explanation: 'ABCD' are ASCII code, so each takes one byte in UTF. Total is 6 because the first two bytes stores the number of characters in the string.

17.13 Which of the following statements are true?

- ☒ A. All files are stored in binary format. So, all files are essentially binary files.
- ☐ B. Text I/O is built upon binary I/O to provide a level of abstraction for character encoding and decoding.
- ☐ C. Encoding and decoding are automatically performed by text I/O.
- ☐ D. For binary input, you need to know exactly how data were written in order to read them in correct type and order.

Your answer A is incorrect
The correct answer is ABCD



Section 17.6 Object I/O

17.14 Which of the following statements are true?

- ☒ A. ObjectInputStream/ObjectOutputStream enables you to perform I/O for objects in addition for primitive type values and strings.
- ☐ B. Since ObjectInputStream/ObjectOutputStream contains all the functions of DataInputStream/DataOutputStream, you can replace DataInputStream/DataOutputStream completely by ObjectInputStream/ObjectOutputStream.
- ☐ C. To write an object, the object must be serializable.
- ☐ D. The Serializable interface does not contain any methods. So it is a mark interface.
- ☐ E. If all the elements in an array is serializable, the array is serializable too.

Your answer A is incorrect
The correct answer is ABCDE



17.15 The Loan class given in the text does not implement java.io.Serializable. Analyze the following code.

```
public class Foo implements java.io.Serializable {  
    private int v1;  
    private static double v2;  
    private Loan v3 = new Loan();  
}
```

- ☒ A. An instance of Foo can be serialized because Foo implements Serializable.
- ☐ B. An instance of Foo cannot be serialized because Foo contains a non-serializable instance variable v3.
- ☐ C. If you mark v3 as transient, an instance of Foo is serializable.

Your answer A is incorrect
The correct answer is BC




Explanation: An object may not be serialized even though its class implements java.io.Serializable, because it may contain non-serializable instance variables.

17.16 Which of the following statements is not true?

- ☒ A. A static variable is not serialized.


- ☐ B. A transient variable is not serialized.
- ☐ C. An object must be an instance of Serializable or Externalizable for it to be serialized.
- ☐ D. The methods in an object are serialized.
- ☐ E. All of the above are true.

Your answer A is incorrect 
The correct answer is D

Section 17.7 Random Access Files


17.17 To create a file, you can use _____.

- ☒ A. FileOutputStream
- ☐ B. FileWriter
- ☐ C. RandomAccessFile
- ☐ D. All of the above.

Your answer A is incorrect 
The correct answer is D

17.18 Which of the following is the legal mode for creating a new RandomAccessFile stream?

- ☒ A. "w"
- ☐ B. 'r'
- ☐ C. "rw"
- ☐ D. "rwx"

Your answer A is incorrect 
The correct answer is C

17.19 What happens if the file test.dat does not exist when you attempt to compile and run the following code?

```
import java.io.*;

class Test {
    public static void main(String[] args) {
        try {
            RandomAccessFile raf =
                new RandomAccessFile("test.dat", "r");
            int i = raf.readInt();
        }
    }
}
```

```
    }  
    catch(IOException ex) {  
        System.out.println("IO exception");  
    }  
}  
}
```

- ☒ A. The program does not compile because raf is not created correctly.
- ☐ B. The program does not compile because readInt() is not implemented in RandomAccessFile.
- ☐ C. The program compiles, but throws IOException because the file test.dat doesn't exist. The program displays IO exception.
- ☐ D. The program compiles and runs fine, but nothing is displayed on the console.

Your answer A is incorrect



The correct answer is C

Explanation: The problem is in line: new RandomAccessFile('test.dat', 'r');
Because the file does not exist, you cannot open it for reading.

17.20 With which I/O class can you append or update a file?

- ☒ A. RandomAccessFile(),
- ☐ B. OutputStream()
- ☐ C. DataOutputStream()
- ☐ D. None of the above

Your answer is correct

