6   Further Java (ARB)

Consider the following program extract from a server application:

```
ServerSocket ss = new ServerSocket(2311);
while(true) {
 Socket s = ss.accept();
 ObjectOutputStream oos =
      new ObjectOutputStream(s.getOutputStream());
 oos.writeObject(new Date());
 s.close();
}
```

(*a*) Describe the difference between `Socket` and `ServerSocket`, including the operation of the `accept()` method.   [3 marks]

(*b*) Write a client program which connects to the server, receives an object, and prints the result of the object's `toString()` method. The three checked exceptions should be handled individually and an appropriate message printed. Ignore unchecked exceptions such as `OutOfMemoryError`.   [5 marks]

(*c*) Does the execution of the `toString()` method in Part (*b*) pose a security risk to the client? Explain your reasoning.   [2 marks]

(*d*) Rewrite the server to support multiple simultaneous client connections. Every second, the server should send a new `Date` object followed by an `Integer` object to all clients. The `Integer` object should contain the number of connected clients.   [10 marks]