1. How does one receive keyboard input?

2. How does one set if an object is an instance of a particular class?

3. What is meant by “Factoring the Server?”

4. What is a “factory” in object oriented programming and what is its use with a server?
5. How does one call a method that throws an Exception? Give example code.

6. How does one convert a String to an array and back?

7. Explain the steps needed to create a TCP socket connection for a server in Java.

8. Explain the steps needed to establish a UDP Client program with Java sockets.
9. How are exceptions bound to handlers in Java?

10. Show what one does in order to abruptly exit a loop.

11. How does one code basic file I/O?

12. How does one read from stdin and write to stdout and stderr?
13. How does one create a single variable that all instances of a class can access?

14. How does one explicitly call a method in a super class?

15. How can a program copy pixels from one spot in the window to another?

II. Answer the following questions regarding threads.
1. How does one launch a thread? (5 Points)

2. What interface must threads implement? (4 Points)

3. Describe the use of the following thread control methods: One or two sentences is enough for each one. (6 Points Each)
   a. start
b. suspend

c. sleep

d. join

e. yield

III. Answer the following questions about network programming and sockets. (10 Points Each)

a. Compare and contrast UDP and TCP functionality.

b. What is the relationship of a stream to a socket?
c. What class does the method getNetAddress() belong to and what is the purpose of this method?

d. Explain the protocol for closing sockets in Java. What is the time-wait state for?

IV. The following questions are concerned with Remote Method Invocation. (10 Points Each).
   1. Define precisely what is meant by a "remote object."

   2. What is meant by "object serialization" and when do we use it?
3. What is the purpose of the `java.rmi.server.UnicastRemoteObject` class? If we do not want to extend this class, what alternative do we have?

4. What is the purpose of the `rmiregistry`?

5. What is a “stub” in RMI, and what is it used for?
V. The following questions deal with databases and their interfaces. (5 Points Each)

1. What purpose does a Statement object serve when using SQL through JDBC?

2. What method of what class is used to execute a SELECT command?

3. What is metadata?

4. What is the relationship between ODBC and JDBC?

5. What does the MySQL constraint auto_increment do?

6. What does the Perl DBI prepare method do?

7. How can a PHP program determine the number of rows in a query result?
VI. The following questions deal with HTTP servers and Servlets. (5 Points Each)

1. What is a servlet container?

2. What is a proxy server?

3. What must the first response of a servlet to a client be?

4. Describe the two parameters to doGet and doPost.

VII. Compare and contrast servlets and CGI as means for writing WEB applications. Describe briefly how each works and give the advantages and disadvantages of each. (12 Points)
VIII. What is the result of each of the six lines of the following Perl script? (2 Points per line)

1. open(PASSWD, "/etc/passwd") || die "Can't open: $!
2. while (chomp($line = <PASSWD>)) {
3. print "$line
4. seek(PASSWD,0,0)) || die "$!
5. while(<PASSWD>) {print if /ellie/;}
6. close(PASSWD);

IX. Give the standard steps in querying databases with JDBC. (8 Points)
X. A. What is the result of each of the four lines of the following Perl script? (2 points per line)

```perl
#!/usr/bin/perl
1. $string="ABCdefghCxyzwerC YOU!!";
2. $string=~s(/.*C.*)/ZAP;  
3. print $1, "a";
4. print $2, "a";
```

B. Give the output from the Perl script above. (6 Points)

DON'T FORGET TO PUT YOUR NAME ON THIS TEST!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!