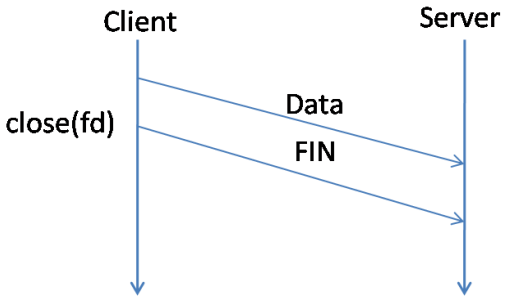
BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
SECOND SEMESTER 2010-2011
IS C462 NETWORK PROGRAMMING
TEST I (CLOSED BOOK)
DATE : 23/2/2011 Weightage: 15% Duration: 50 mts

Note:
Write all parts of a question together
Use diagrams to present your ideas wherever possible

Q1. Answer the following to the point [6]

a. In TCP/IP protocol suite, explain the role of a port number? Give reasons why the end point address doesn't include the process id but a port number?
b. Differentiate between connection and socket with respect to TCP? Also differentiate between active and passive ends with respect to TCP connection?
c. While programming UDP applications, how do we calculate maximum datagram size? What factors are taken into account? Justify.
d. List I/O models in UNIX systems. Explain the working of IO Multiplexing.
e. While writing a concurrent TCP server that is supposed to work continuously for several months, what harm zombie children can do? How zombie children can be avoided?
f. Explain the transitions of TCP connection state at client and server ends for the following timeline diagram till the connection reaches CLOSED state.



Answer the following questions. Wherever design is mentioned, it is expected to identify processes with proper naming, how they communicate and how they are implemented. Wherever program is mentioned, it is expected to write a near-program including appropriate system/function calls at appropriate places. Marks will depend on how technically you have written your near-program.

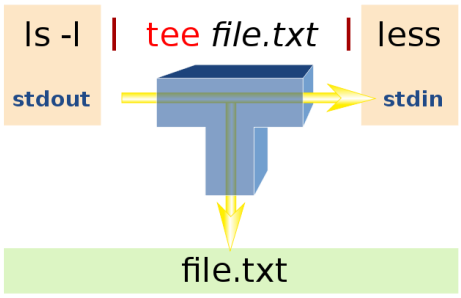
Q2. Consider a multi-user unix system where multiple users can login concurrently into the system. The administrator would like to provide an application that allows logged-in users to send chats to other users who are currently online or offline. Username is used to identify the receiver. Give design outline and write programs to fulfill the above needs. [4]

Q3. An organization has developed a plug-in called 'SpamSpy' that has implemented an algorithm to determine whether a particular email is a spam or not. This plug-in is an executable file that expects input from standard input and writes its result to standard output. Now consider an email client that has to use this plug-in. Mention the design of email client program with respect to how should it interact with the plug-in. Write a program that makes use of the plug-in. [3]

Q4. The command 'tee' works in the following way.

```
ls –l | tee file.txt | less
```

tee command takes the input and writes to a file called file.txt and also writes as shown in the following diagram. Write a program implementing tee command that can work independently as well as in combination with other commands [2]



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