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

**Q1.** Answer the following to the point  [4]

1. Why is a signal generated for the writer of a pipe after the reader disappears not for the reader of pipe after its writer disappears?
2. Write a piece of code that creates a child and that child terminates the parent using a SIGKILL signal.
3. What is the effect of fork() on a) pipe b)message queue c) shared memory d) semaphores
4. How is the following unexpected event handled in TCP connection termination sequence?
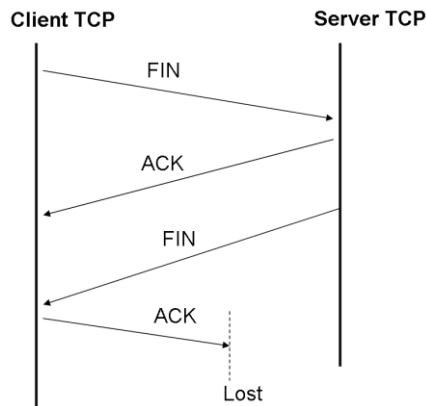


**Q2.** Explain the framing methods (identifying message boundaries) used in HTTP and TFTP protocols. [2]

**Q3.** Consider N processes. They are to be arranged in a circular topology as shown below. They are supposed to play a game by passing on a number in clock-wise direction. Write a program segment that sets up this topology. In the topology, every process must know the pid of the next process in clock-wise direction. [3]
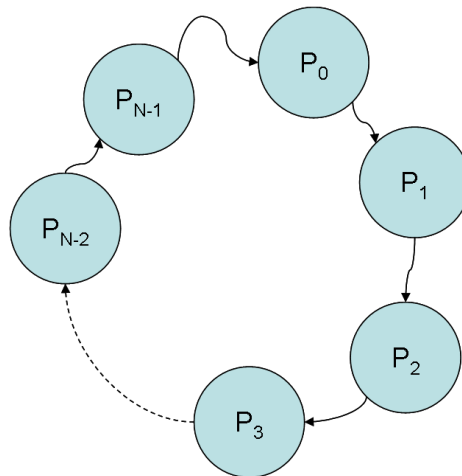
**Q4.** Consider a new operator '||'. It will take the output of the previous program and pass it on as input to two different programs. Give a program segment for implementing the following command: `ls -l || grep ^d, grep ^-` [2]

**Q5.** Explain the transitions of TCP connection states from ESTABLISHED state on client side as well as server side triggered by the following event. [2]
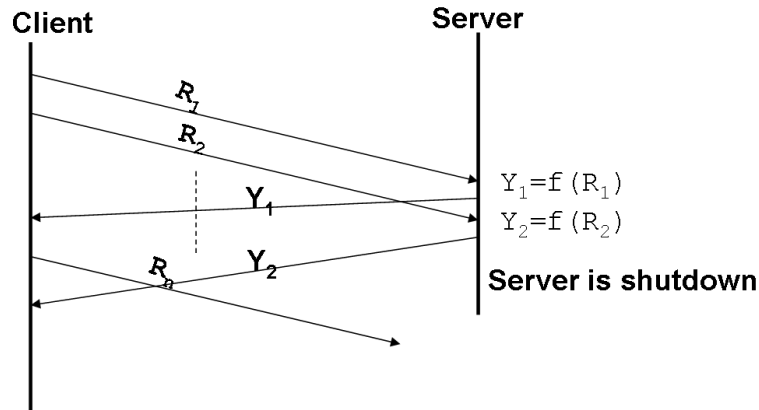


**Q6.** In chat server design, clients interact with each other through a central server. Server is supposed to handle multiple clients at the same time. Message coming from one client needs to be forwarded to another client. For such a requirement, suggest a concurrency model (multi-process or I/O multiplexing). Justify. Give program flow for forwarding messages. [2]

----------------------------------------End of Question Paper--------------------------------