**Sample question.**

**1. (10 points) Dynamic memory management issues**

List 5 important issues when dealing dynamic memory. Explain these issues with an example each.

**2. (15 points) Signal and handler (Study pingpong)**

a) Write a pseudo code that defines a signal for constant 54 and a handler that counts the number of occurrences of this signal. After it counts it, it resets the signal to allow it re-occur.

b) Write the main program (pseudo code) that loops forever: inside the loop, it prints the count, it then sleeps for random time and gets interrupted by signal 54 from the keyboard.

c) How will you interrupt (signal) the main program with a signal 54?

**3. ( 3 + 3 +3 + 6 = 15 points) Xinu internals**

**(i)** What does function call **create** accomplish in the following command?

**ready(create((void \*)shell, INITSTK, INITPRIO, "SHELL0", 1, CONSOLE),RESCHED\_NO);**

**(ii)** what does function call **ready** accomplish using the following command?

ready(create((void \*)shell, INITSTK, INITPRIO, "SHELL0", 1, CONSOLE),RESCHED\_YES);

**(iii)** In Project 2, how did you use a single WRT54GL –based XINU to chat between two users?

**(iv)** What are the three important data structures used in xinu for managing processes, devices and semaphores respectively? Explain their structures.

**4. Pipe() for inter-process communication: look at the example posted**

**5. fork() exec() , parent forking multiple children, look at demo directory fork examples**