1. Answer the following questions related with process status
2. Why a process in ready status cannot switch to blocked/waiting status directly?
3. A process is waiting for the finish event of disk I/O. Who will wake up it? Why?
4. Breakpoint is a handful function when debugging. Please use knowledge learned in OS course to design how to implement breakpoint function. Notice, do NOT add, delete or modify any features of hardware.
5. The P operation of semaphore is implemented like:

P(s) {  
 s--;  
 while s<0  
 ;  
}

Answer the following questions:

1. What it means if the value of semaphore is 3? And -3?
2. A process will call P(). Please explain all the possible results after calling.
3. Is P() and V() in critical section? Why? Is there any special thing to do?
4. Is it possible to implement a semaphore whose value will never be positive? If yes, tell me how. If no, tell me why.
5. Answer the following questions related with dead lock
6. What is deadlock? If a deadlock has happened, what would it lead to?
7. In bank algorithm, if the number of available resources is less than the number of needed resources of a process, there will surely be a deadlock. Is it right or wrong? Why?
8. Why OSes usually ignore the problem of deadlock?
9. If an OS want to have the ability of recovery from deadlock. How to implement? Describe your method in brief.
10. Answer the following questions related with file system
11. A disk is used to store dictionary files for dictionary software (such as xdict, stardict). Which disk space allocation method is the best for the disk? Why?
12. A file system is based on indexed allocation method. There are two index items in FCB. The first one points to data block directly and the second points another inode which points to data blocks. The size of inode and data block is 16 bytes. The address of a block is 4-bytes wide. What is the maximum size of files? Describe the calculation process briefly.
13. If a file has reached the maximum size, how many times the I/O occurs when reading the whole file for the first time? How many times the I/O occurs when reading the whole file for the second time? (Only FCB is loaded into memory during boot. The OS supports disk cache) Describe the calculation process briefly.
14. Answer the following questions related with CPU schedule
15. What is CPU shchedule?
16. How a process’s priority changes along with the period the process has been waiting for in ready queue? Why?
17. What is Round Robin? Point out one advantage and one disadvantage of Round Robin.
18. There are for processes, P1, P2, P3 and P4. They come at 0, 2, 3 and 5, and their execution time are 8, 6, 4 and 3. The time slice is 2. Please describe the schedule result (who is scheduled to run at any time) of Round Robin by text or graph. Calculate the average turnaround time.
19. Answer the following questions related with memory management
20. What is demand page? Please tell two advantages of it.
21. Why LRU page replacement algorithm can work? In what situation it cannot work?
22. A two arms clock algorithm: Both arms forward once a second. The first arm cleans the reference bits. The second arm swaps out old pages. There are always three pages between the two arms.  
    Assume that one page reference occurs every second. The current status is described in the following figure. Now, there is a sequence of page reference, 10, 5, 77, 4 and 10. What will the figure looks like after 5 seconds?

