2018 Operating System Final (CLD)

*Warning: This documentation is drafted with pure memory, which is often inaccurate.*

1. Please explain following terms.
   1. Semaphore
   2. Critical Section
   3. Thrashing
2. List four necessary condition of **deadlock**.
3. Please fill the following blanks of Peterson’s Solution.

| do {  flag[i]=true;  turn = ＿; //tip: i or j  While (＿＿＿＿); //tip: flag[?] && turn==?  // critical section  flag[i] = ＿; //tip: true or false  // remainder section  } while (TRUE); |
| --- |

1. List two method to **prevent** deadlock
2. Draw the resource-allocation graph & wait-for graph
3. Banker algorithm
   1. Need
   2. Safe state or not
   3. Given an process request, asking whether accept request or not
4. Please list and explain best-fit, first-fit and worst-fit.
5. Briefly explain copy-and-write and why we need it
6. LRU, FIFO, Page fault
7. Please explain and compare “sequential access” and “direct access”D
8. List three disk allocation method
9. Please explain RAID 0 and RAID 1.
10. There are kinds of storage types like 'magnetic disk', 'cache', 'tapes', 'optical disk', 'register' and 'main memory'. Compare the access speed above in arranged order (From fast to slow). (3%)
11. Please described the advantage of using a virtual machine? (At least two points of view) (4%)
12. Draw the state diagram of processes, and explain each state. (10%)
13. Please draw the Gantt charts and calculate the average waiting time of the following processes for the problems shown below.
    1. First come first served (FCFS)
    2. Round-Robin, time quantum = 2
    3. Preemptive shortest-remaining-time-first

| Process | Arrival Time | Burst Time |
| --- | --- | --- |
| P1 | 0 | 3 |
| P2 | 3 | 5 |
| P3 | 4 | 2 |
| P4 | 5 | 3 |
| P5 | 7 | 6 |