OS Midterm Exam, 25th, Oct 2021 Autumn

1. Draw the Operating System Structure and describe each component. (10 points)

2. What are the meanings of "user mode" And "kernel mode" in OS? and describe how to access to kernel mode from user mode. (5 points)

3. Draw the diagram of process state and describe each state. (10 points)

4. Describe the operation of interrupt in details. (10 points)

5. What is Inter-Process Communication (IPC)? And describe in detail with advantages and disadvantages of IPC methods. (10 points)

6. Consider the following set of processes, with the length of the CPU burst given in milliseconds. You have to show the GANTT chart for Preemtive Shortest Job First Scheduling and calculate an average waiting time (15 points)

	Burst Time	*Arrival Time*
P1	*10*	*0*
P2	*5*	*2*
P3	*1*	*3*
P4	*4*	*5*

7. What is the meaning of the CPU burst process & I/O burst process? And describe the example SW for each burst process. (5 Points)

8. What is the critical-section problem? And describe the detailed condition and code-level example for critical section. (15 Points)

9. Describe why Mutual Exclusion is needed in concurrent program environment. You have to show example. (10 points)

10. Describe detailed the semaphore operation of synchronization methods. (10 points)