Operating Systems, Tutorial 1.

Week3

Question 1.

(a) What is the difference between kernel mode and user mode? Why is the difference important to an OS?

(b) Which of the following instructions should be allowed only in kernel mode

1- disable all interrupts
2- read the time-of-day clock
3- set the time-of-day clock
4- change the memory map

Question 2

(a) What is the main difference between a process and a thread?

(b) In a system with threads, is there normally one stack per thread or one stack per process? Explain

Question 3

Draw a diagram that illustrate the transitions of a process state for

a) a non pre-emptive scheduler
b) a pre-emptive scheduler

Give two reasons to support pre-emption.

Question 4

The table below describes the CPU-I/O Burst cycles for processes P1, P2 and P3. Assume 0 is the highest priority.

Process	Priority	Arrival time	CPU Burst 1	I/O Burst 1	CPU Burst 2	I/O Burst 2	CPU Burst 3
P1	1	0	10	4	12	-	-
P2	0	7	4	10	4	12	2
P3	2	4	6	2	6	-	-

(a) Draw the Gantt chart timeline, illustrating the interleaving of processes, and calculate the average waiting time for each process under

1. a non pre-emptive priority scheduling algorithm
2. a round robin scheduling algorithm with quantum = 6.