Q1.

Of these two types of programs: a. I/O-bound b. CPU-bound which is more likely to have voluntary context switches, and which is more likely to have nonvoluntary context switches? Explain your answer.

Q2. Consider the following set of processes, with the length of the CPU burst given in milliseconds:

Process	Burst Time	Priority
P_1	5	4
P_2	3	1
P_3	1	2
P_4	7	2
P_5	4	3

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at times 0,1,2,3,4 respectively. Make suitable assumptions.

a) Draw Gantt chart that illustrates the execution of these processes using the SRTF.
b) What is the turnaround time of each process in part a?
c) What is the waiting time of each process?
d) What is the average waiting time (over all processes)?

Q3. In Chapter 3, we discussed Google's Chrome browser and its practice of opening each new tab in a separate process. Would the same benefits have been achieved if, instead, Chrome had been designed to open each new tab in a separate thread? Explain.

Q4. Show C code snippet (that uses Pthread library to create threads) where 3 threads perform different computations on an integer array of size 300. 1st thread sums it, 2nd thread compute average and 3rd thread multiplies each element with 2.