Prepare your answers to the following questions either in a plain text file or in a Microsoft Word file. Answer each question clearly and concisely, and state conclusions using complete sentences. Explanatory tables and/or diagrams are acceptable, but there must always be a written discussion as well.

Submit your file to the Curator system by the posted deadline for this assignment. No late submissions will be accepted.

1.   [10 points] Assume a short-term batch scheduler managing only Ready and Running states, receives the following collection of jobs at the system time 0:

i	0	1	2	3	4	5	6	7	8	9
$\tau(p_i)$	150	90	30	60	120	20	120	180	70	10

   The scheduler executes the collection of jobs as a single batch, in the order listed above, assigning them PIDs in the order they reach the Running state. For each job, determine the wait time, the turnaround time and the finish time.

2.   [10 points] Repeat question 1, assuming the short-term scheduler uses the shortest job next protocol.

3.   [10 points] Repeat question 1, assuming the short-term scheduler uses a round-robin multi-tasking protocol with a time quantum of 20, and ignoring the time required for a process switch.

4.   [10 points] Repeat question 3, assuming the time required for a process switch is 2.

Note: unless you actually enjoy doing tedious calculations by hand, and worrying about whether you have checked your work carefully enough, the easiest way to this assignment is to write a simple program to simulate the scheduling process with the different relevant protocols.