2010 Paper 2 Question 3

Operating Systems

(*a*) Shortest Job First (SJF), Shortest Remaining Time First (SRTF) and Round Robin (RR) are CPU scheduling algorithms. Briefly describe each.
[1 mark each]

(*b*) Consider the following set of processes.

Process	Creation Time	Required Computing Time
P_1	0	25
P_2	5	15
P_3	10	5
P_4	15	5

    (*i*) Draw a diagram showing how SJF would schedule the processes. What is the average waiting time? [3 marks]

    (*ii*) Draw a diagram showing how SRTF would schedule the processes. What is the average waiting time in this case? [3 marks]

    (*iii*) Assuming a quantum of 10 time units, draw a diagram showing how RR would schedule the processes. What is the average waiting time in this case? [3 marks]

    (*iv*) A student suggests that RR could be improved by reducing the quantum to 1 time unit. What are the advantages and disadvantages of this proposal? [2 marks]

(*c*) Compare and contrast the UNIX *buffer cache* and the Windows NT *cache manager*. [6 marks]