2011 Paper 5 Question 2

Computer Design

(*a*) For a processor pipeline, what is the difference between control and data dependencies? [4 marks]

(*b*) For a superscalar processor, under what conditions can instructions from the same thread be executed in parallel? [4 marks]

(*c*) What does it mean to have coherent shared memory and in this context what do the terms *write propagation* and *write serialisation* mean? [8 marks]

(*d*) If a simultaneous multithreading processor core supports two hardware threads (or *Hyperthreads*), under what conditions might performance be decreased by scheduling two jobs in parallel rather than running them sequentially? [4 marks]