6. (a) One of the main heuristic rules for query optimisation is to apply SELECT and PROJECT before JOIN. Explain why. [4]

   (b) What is the difference between pipelining and materialisation? [4]

   (c) A file of 4096 blocks is to be sorted with an available buffer space of 64 blocks. How many passes will be needed in the merge phase of the external sort-merge algorithm? [5]

   (d) Outline the six steps of the heuristic algebraic optimisation algorithm. [12]

Total mark for this question: 25